Swedish Tax Policy: Recent Trends and Future Challenges

Peter Birch Sørensen

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the Expert Group on Public Economics
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Förord

Debatten om skatter blir ofta fragmentarisk. Plötsligt koncentreras all uppmärksamhet på hur en eller annan skatt bör förändras. Det är problematiskt på flera vis. Det är viktigt att utformningen av skattesystemet som helhet vägleds av tydliga principer, att systemet är någorlunda förutsägbart och stabilt, och att de samhällsekonomiska kostnaderna för ett visst skatteuttag blir så låga som möjligt.

Expertgruppen för studier i offentlig ekonomi (ESO) har i uppdrag att självständigt bidra till att bredda och fördjupa underlaget för framtida samhällsekonomiska och finanspolitiska avgöranden. Få frågor är därför naturligare för ESO att ta sig an än en samlad genomlysning av hela det svenska skattesystemet.

I denna rapport till ESO har professor Peter Birch Sørensen på ett grundligt sätt tagit sig an den omfattande uppgiften att studera effekterna av vårt skattesystem på samhällsekonomin. Det gör han dels genom att redogöra för systemets utveckling, dels genom att analysera hur det fungerar i dagens internationella sammanhang. Rapporten tar avstamp i den stora skattereformen 1991, som gav Sverige ett i många avseenden rationellt skattesystem, med likformighet mellan olika skattebaser och enhetliga skattesatser. De centrala frågeställningarna är om de förändringar som har genomförts sedan dess har resulterat i ett mer effektivt skattesystem, och om något i dag behöver åtgärdas för att skatterna ska kunna tas in med så små samhällsekonomiska störningar som möjligt.

Analysen baseras i hög grad på en modell som författaren utvecklat för att studera effektivitetsförluster i skattesystemet och beräkna s.k. dödviktseffekter för olika skatteområden. Med hjälp av dessa rangordnas skattebaserna från de som är minst känsliga för beskattning till de som påverkas mest. Nästa steg i analysen är att

studera regelverken inom enskilda skatteområden, för att se om de har bästa möjliga utformning.

Rapporten utmynnar i ett antal konkreta förslag. Författaren anser att den tidigare rådande principen om enhetlig och likformig beskattning i stor utsträckning borde vara styrande för skatteuttaget även i dag. Han föreslår exempelvis en återgång till en enhetlig moms och en enhetlig beskattning för merparten av kapitalinkomsterna. I detta sammanhang diskuteras också hur en effektiv fastighetsskatt bör utformas. Vidare föreslås ett slopande av värnskatten.

Arbetet med rapporten har följts av en referensgrupp bestående av personer med god insikt i skattefrågor. Som brukligt är i ESO-sammanhang, ansvarar författaren själv för innehållet, slutsatserna och de förslag som presenteras i rapporten.

Det är min förhoppning att denna rapport ska bidra till en välbehövlig, offentlig diskussion om det svenska skattesystemet som helhet. Kanske behöver det återigen utsättas för en samlad översyn?

Stockholm i maj 2010

Lars Heikensten
Ordförande för ESO

Preface and acknowledgements

As an interested observer of Swedish tax policy for many years, I was pleased when the ESO group invited me to review the current Swedish tax system. As an outsider I have always been impressed by the Swedish tradition of preparing important changes in public policy through careful investigation of alternative policy options, drawing on relevant experience and expertise. In the area of tax policy one of the most impressive outcomes of such knowledge-based policy reform was the 1991 "Tax Reform of the Century" which was a source of inspiration for many other countries and which still provides the foundation for today's tax system.

With this report I hope to make a small contribution to the continuation of the Swedish tradition of using applied economic research as an important input in tax policy design. My analysis naturally leads me to suggest a number of changes to the current Swedish tax system. However, while I hope that these proposals will stimulate discussion – several of them are undoubtedly controversial – the main purpose of this report is to illustrate by concrete examples how economic analysis can be used to quantify the effects of tax policy on resource allocation and economic efficiency. Of course a change in tax policy should not be decided solely on the basis of its impact on economic efficiency. Its effect on income distribution is equally important – perhaps even more important in the eyes of many observers. But to make a rational trade-off between the goal of increasing the average standard of living and the goal of ensuring an equitable distribution of income, policy makers must know how tax policy affects the efficiency with which economic resources are utilized. This report offers some new methods for estimating the impact of tax policy on economic efficiency.

In preparing the report I have benefited from assistance from Åsa-Pia Järliden Bergström and Martin Hill and several of their colleagues in the Ministry of Finance who were very helpful in providing me with data. Åsa-Pia and Martin also offered valuable comments on earlier drafts of various parts of the report, as did Peter Englund, Lars Heikensten, Ann-Sofie Kolm, Anders Kristoffersson and Agnar Sandmo. I am grateful for all of these constructive inputs. The responsibility for any remaining shortcomings and for the policy proposals made rests solely with me.

Copenhagen, May 2010 Peter Birch Sørensen

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Sammanfattning

I denna rapport redovisas en kritisk översikt över det nuvarande svenska skattesystemet. Den visar hur avvikelser från principerna om neutralitet och likformighet i skattesystemet skapar ett antal snedvridningar, och den ger kvantitativa uppskattningar av förlusten i ekonomisk effektivitet som orsakas av de största snedvridningarna. Mot denna bakgrund presenteras ett antal reformförslag som kan eliminera eller åtminstone reducera de olika snedvridningarna utan att försämra de offentliga finanserna. Nedan sammanfattar vi de huvudsakliga lärdomarna och policyförslagen från varje kapitel i rapporten.

Kapitel 1: Det svenska skattesystemet i internationell kontext

Det första kapitlet behandlar det nuvarande svenska skattesystemet mot bakgrund av internationella skattepolitiska trender. Kapitlet sammanfattar de senaste politiska trenderna i OECD-länderna på följande sätt:

- De totala skatteinkomsternas andel av BNP har varit relativt stabil
- Skattesystemen har trendmässigt rört sig från inkomstskatt mot socialförsäkringsavgifter
- De högsta marginalskattesatserna på inkomst har sjunkit väsentligt, men den genomsnittliga skattesatsen som betalas av en genomsnittlig arbetare har knappt förändrats
- Lagstadgade bolagsskattesatser har också sjunkit avsevärt, men bolagsskatteintäkternas andel av BNP har hållit sig relativt stabilt eftersom bolagsskattebasen har utökats
- Trenden i Västeuropa har gått från skattelättnad genom avräkningssystem vid aktieutdelning mot enklare system som involverar reducerade inkomstskattesatser på aktieutdelningar

- Andelen av intäkterna som kommer från moms har ökat, men andelen intäkter från punktskatter har minskat i högre utsträckning, så andelen av de totala intäkterna som kommer från konsumtionsskatter har minskat
- Intäkterna från miljöskatter har minskat något i förhållande till BNP
- De totala intäkterna från egendomsskatter har hållit sig relativt stabila i förhållande till BNP, trots att flera länder har avskaffat sin förmögenhetsskatt

Medan skattekvoterna har hållit sig i stort sett konstanta i OECD-området som helhet har Sverige reducerat den totala skattenivån med flera procentenheter under de senaste åren, delvis genom att sänka skatten på arbete. Som en följd av detta har Danmark gått om Sverige som landet med högst skatter i förhållande till BNP. Sverige beskattar dock fortfarande arbetsinkomst högre än de flesta andra OECD-länder. Precis som Danmark sticker Sverige ut genom att förlita sig mer på inkomstskatter än ett genomsnittligt OECD-land. Socialförsäkringsavgifter och moms genererar ungefär lika stora andelar av de totala intäkterna i Sverige som i ett genomsnittligt västeuropeiskt EU-land, medan specifika konsumtionsskatter, egendomsskatter och bolagsskatten bidrar med en mindre del av de totala intäkterna i Sverige än i EU15-området.

Kapitel 2: Århundradets skattereform

I syfte att ge ett historiskt perspektiv på den nuvarande svenska skattepolitiken beskriver kapitel 2 bakgrunden till och huvudelement i den stora svenska skattereformen från 1991, som ofta kallas "århundradets skattereform". Reformen var väldigt ambitiös och innehöll en kombination av sänkta skattesatser och breddade skattebaser, med sammanlagt cirka 6 procent av BNP. 1991 års reform var anmärkningsvärd även i andra avseenden. Den innebar kulmen på en lång utredningsprocess där olika reformförslag studerades noggrant av olika kommittéer bestående av vetenskapliga skatteexperter, offentligt anställda, politiker och representanter från de viktigaste intressegrupperna. Under denna långa process av detaljerad analys nådde nyckelaktörerna i den svenska skattepolitiska debatten stor enighet rörande de huvud-

sakliga svagheterna i det gamla skattesystemet och vilka riktlinjer i en skattereform som hade bäst förutsättningar. Följaktligen vägleddes skattereformen av tydliga principer som säkerställde en hög grad av konsistens när reformen sedan genomfördes. Resultatet var närmast revolutionerande. Den lagstadgade bolagsskattesatsen reducerades exempelvis till omkring hälften, men den påföljande intäktsförlusten kompenserades till fullo genom att bolagsskattebasen breddades. Dessutom påverkade skattereformen alla viktiga delar av skattesystemet som t.ex. inkomstskatten, bolagsskatten, socialförsäkringsavgifterna, momsen och fastighetsskatten.

I och med 1991 års skattereform infördes det system som nu har blivit känt som "den nordiska duala modellen" som skiljer på kapitalinkomstbeskattning och beskattning av annan inkomst. Den duala modellen kombinerar progressiv beskattning av arbete och transfereringsinkomster med en relativt låg skatt på kapitalinkomster, proportionellt sett. En låg enhetlig skattesats på kapitalinkomst infördes som ett enkelt sätt att kompensera för det faktum att skatten på kapitalinkomst påförs nominella inkomster i stället för den faktiska avkastningen. Ytterligare ett skäl var att möjliggöra en betydande breddning av skattebasen för kapitalinkomst och för att få en mer enhetlig beskattning av de olika formerna av inkomst från kapital, inklusive kapitalvinster. Skattesatsen på kapitalinkomst sattes till 30 procent, i linje med bolagsskatten, medan den högsta marginalskatten på arbetsinkomst landade på 51 procent.

De grundläggande principerna bakom skattereformen var neutralitet och likformighet i beskattningen. Reformen var anmärkningsvärd för den nit med vilken den fullföljde dessa mål. Förutom att motivera en kraftig breddning av skattebaserna för inkomstskatt och bolagsskatt betydde antagandet av principerna neutralitet och enhetlighet att flera andra typer av inkomst som tidigare hade varit skattebefriade eller skattemässigt gynnade blev föremål för skatt på den generella nivån. På liknande sätt fick mervärdesskatten en mycket bredare bas, och en enhetlig momssats på alla (beskattningsbara) varor och tjänster antogs.

Inriktningen på neutralitet och likformighet sågs inte enbart som ett sätt att förbättra den ekonomiska effektiviteten; den uppfattades också som ett sätt att säkerställa ett rättvisare skattesystem. Genom att beskatta alla former av inkomst och konsumtion med generella skattesatser stärktes den horisontella rättvisan, dvs. principen att skattebetalare med samma betalnings-

förmåga ska betala samma summa i skatt. Det hävdades också att breddningen av skattebaserna i skattereformen främjade målet om vertikal rättvisa, dvs. principen att skattebetalare med större betalningsförmåga ska betala mer i skatt. Argumentet var att i praktiken tenderade de många skatteavdragen och särskilda bestämmelserna i det gamla skattesystemet att gynna de rika och sofistikerade skattebetalarna som hade bättre möjligheter att skatteplanera.

Politikerna bakom skattereformen ville därför understryka att resultatet skulle bli fördelningsmässigt neutralt, trots den stora minskningen i marginalskattesatser och det omfattande breddandet av skattebaser. Efterföljande empiriska studier antyder att reformen i praktiken hade mycket liten påverkan på den totala inkomstomfördelningen.

På lång sikt gav den stärkta neutraliteten i beskattningen av olika sparmedel en jämnare fördelning av sparandet. Men det kanske viktigaste resultatet av 1991 års skattereform var minskningen av genomsnitts- och marginalskattebördan på arbete (som var extremt hög innan reformen) tillsammans med en högre genomsnittlig och effektiv marginalskattesats på fastighets-investeringar (som var i hög grad subventionerat i det gamla skattesystemet). Även med mycket konservativa antaganden om arbetskraftsutbudets känslighet för beskattning, innebar de sänkta marginalskattesatserna en väsentlig minskning av den förlust i ekonomisk effektivitet som kan hänföras till skatt på arbete.

De långsiktiga effektivitetsvinsterna fick emellertid kortsiktiga kostnader. På kort sikt innebar de förbättrade incitamenten för finansiella besparingar och den tyngre skattebördan på fastighetsinvesteringar och andra varaktiga konsumtionsvaror att den sammanlagda efterfrågan på varor och tjänster minskade, och därmed förvärrades den djupa lågkonjunkturen i början av 1990-talet.

Sammanfattningsvis representerade skattereformen 1991 ett djärvt experiment inom skattepolitiken baserat på tydliga principer som ledde till ett mycket mer konsekvent skattesystem. Trots att tidpunkten för reformen visade sig vara olycklig genom att den tenderade att förvärra en allvarlig lågkonjunktur, finns det tunga skäl att tro att reformen bidrog till en effektivare fördelning av resurser på lång sikt utan att offra målet, rättvisa i beskattningen.

Kapitel 3: Trender i den svenska skattepolitiken sedan århundradets skattereform

Kapitel 3 granskar i korthet de viktigaste förändringarna i skattepolitiken sedan början av 1990-talet. Det skattesystem som etablerades med den stora skattereformen 1991 har stått sig i flera viktiga avseenden. På området individernas inkomstskatt har grundprinciperna i den duala modellen i stort sett bibehållits. Introduktionen av ett jobbskatteavdrag år 2007 var en viktig nyhet för beskattningen av arbetsinkomst. Jobbskatteavdraget är huvudsakligen avsett att stimulera arbetskraftsdeltagandet, medan minskningarna i marginalskattesatsen i 1991 års reform fokuserade mer på målet att öka antalet arbetade timmar för de redan anställda. Syftet med båda dessa politiska åtgärder har dock varit att öka arbetsutbudet, så i den bemärkelsen är de relativt konsekventa.

Inom området bolagsskatt har svenska politiker hållit sig till den viktiga principen att kombinera en bred skattebas med en relativt låg skattesats, snarare än att försöka finjustera nivån och sammansättningen av investeringarna genom olika specialavdrag och ersättningar som skulle kräva en högre skattesats för att generera samma intäkter. Det är dock tvivelaktigt om de olika skattelättnaderna som beviljats till aktiva ägare av fåmansföretag sedan skattereformen, har förbättrat neutraliteten i skattesystemet i förhållande till alternativa bolagsformer.

Under senare år har vi bevittnat en förskjutning mot reducerade socialavgifter för utvalda grupper på arbetsmarknaden och ett införande av skatterabatter för köp av hushållsnära tjänster. Dessa förändringar i skattepolitiken kan ses som obefogade avvikelser från de principer om enhetlig beskattning som låg bakom skattereformen. Men som argumenteras i kapitel 5 och 6 i rapporten, kan det finnas en god teoretisk grund också för politik av detta slag, även om den specifika utformningen av nuvarande politik inte är helt optimal.

De viktigaste avvikelserna från principerna i 1991 års skattereform har varit förskjutningen mot en differentierad moms, introduktionen av en ytterligare nivå i beskattningen av höginkomsttagare (värnskatten) och de avsevärda skattebidrag till investeringar i egnahemsbostäder som följde med 2008 års fastighetsskattereform. Analysen i kapitel 5 till 7 i denna rapport pekar tydligt på att dessa avvikelser från skattereformens principer var olyckliga och borde omprövas.

Kapitel 4: Dödviktsförlust från beskattning i Sverige

När beslutsfattare bedömer behovet av en omstrukturering av skattesystemet bör de även beakta de ekonomiska snedvridningar som kan orsakas av de olika skatterna. Kapitel 4 söker tillhandahålla sådan information genom att uppskatta s.k. marginella dödviktsförluster från de viktigaste svenska skatterna. Marginell dödviktsförlust är skillnaden mellan det belopp som skulle behövas för att kompensera skattebetalarna för en höjning av en viss skattesats och den offentliga sektorns nettointäkt från skattehöjningen. Som framgår av kapitlet är den marginella dödviktsförlust som skapas av höjning av en viss skatt lika stor som den självfinansieringsgrad som är knuten till en sänkning av denna skattesats. Självfinansieringsgraden definieras som den andel av det direkta statiska intäktsbortfall som ersätts i och med att de olika skattebaserna ökar till följd av beteendeeffekter orsakade av den lägre skattesatsen. Den metod för att beräkna självfinansieringsgrader som utvecklas i kapitel 4 tillåter interaktion mellan skattebaser, dvs. den beaktar förhållandet att en ökning (minskning) av en skattebas har positiva (negativa) spridningseffekter på andra skattebaser. Analysen beaktar också de olika bosättningsbaserade skatterna på sparande (såsom individernas kapitalinkomstskatter) och källbaserade skatter på investeringar (t.ex. bolagsskatten).

Vi beräknar självfinansieringsgrader kopplade till sänkningar i effektiva marginalskattesatser på 1) arbetsinkomst, 2) konsumtion, 3) bolagsinkomster (beskattade enligt källprincipen), och 4) inkomster från sparande (beskattade enligt bosättningsprincipen). Beräkningarna baseras på aktuella uppgifter från Nationalräkenskaperna och information om svenska skatteintäkter, och det uppskattade riktmärket för självfinansieringsgraden baseras på ett antagande om en elasticitet för beskattningsbar arbetsinkomst som är något konservativt mot bakgrund av nyligen gjorda empiriska uppskattningar av denna parameter för Sverige. När vi avpassar ränteelasticiteten för sparande och arbetsutbud, om vilken relativt lite är känt, så utnyttjar vi länken mellan denna elasticitet och den elasticitet för beskattningsbar arbetsinkomst som är gängse i ekonomisk teori.

Mot bakgrund av värdena på de riktmärkesparametrar som vi anser vara mest sannolika uppskattar vi att en sänkning av konsumtionsskatterna kommer att generera en intäktsökning på

ungefär 16 procent av det initiala statiska intäktsbortfallet. En generell sänkning i marginalskattesatsen på all arbetsinkomst har visat sig ha en självfinansieringsgrad på ungefär 24 procent, och en sänkning i bolagsinkomstskatt beräknas ha en självfinansieringsgrad på nära 30 procent, medan den självfinansieringsgrad som genereras av en sänkning i skatten på inkomst från sparande visar sig vara 36 procent.

I alla de tänkta scenarierna ser vi att den självfinansieringsgrad som är knuten till en sänkning av de indirekta skatterna på konsumtion är lägre än den självfinansieringsgrad som gäller för de tre andra skatteinstrument som ingår i analysen. Anledningen är att en del av den konsumtionsbaserade skattebasen är oelastisk, eftersom en del av den sammanlagda konsumtionen finansieras av offentliga transfereringar till pensionärer och andra individer som har lämnat arbetsmarknaden permanent, vilket medför att deras arbetsutbud inte påverkas av en förändring i konsumtionsskatten.

När den initiala effektiva marginalskattesatsen på bolagsinkomst är positiv finner vi också att en sänkning av bolagsskatten (t.ex. en sänkning i bolagsskattesatsen) alltid kommer att ha en högre självfinansieringsgrad än en sänkning i skattesatsen för arbetsinkomster. Förklaringen är att i alla små, öppna ekonomier med perfekt kapitalrörlighet resulterar en sänkning av bolagsskatten i ett inflöde av kapital och en påföljande ökning i inhemska investeringar, vilket pågår till dess att fördelarna av skattesänkningen helt har överförts till den inhemska arbetskraften genom reallönehöjningar. Precis som en sänkning av skatten på arbetsinkomster, stimulerar därför en sänkning i bolagsskatten arbetsutbudet, men den genererar dessutom en kapitalimport som utökar bolagsskattebasen ytterligare, och den föranleder därmed en större dynamisk intäktsökning än vad som uppnås vid en sänkning av arbetsinkomstskatter med samma statiska intäktsförlust.

Eftersom en lägre självfinansieringsgrad indikerar en lägre marginell effektivitetsförlust av beskattning, kan vår slutsats att indirekta konsumtionsskatter har en lägre självfinansieringsgrad än andra skatter möjligen tolkas som ett argument för en övergång från direkt till indirekt beskattning. Skälet till den låga marginella dödviktsförlusten är dock att konsumtionsskatterna delvis betalas av personer som står utanför arbetskraften och vars arbetsutbud inte reagerar negativt på en högre konsumtionsskattesats. De flesta av dessa personer har relativt låga löpande inkomster. Dessutom kan en indirekt konsumtionsskatt inte ta hänsyn till de specifika

omständigheterna hos en enskild skattebetalare, medan den progressiva personliga skatten på arbetsinkomst baseras på skattebetalarens betalningsförmåga. Rättviseskäl kan därför göra en övergång från direkt till indirekt beskattning oönskad, trots att en sådan övergång skulle förbättra den ekonomiska effektiviteten.

En annan handfast slutsats är att självfinansieringsgraden för en källbaserad skatt på bolagsinkomst - som bolagsskatten - alltid är högre än självfinansieringsgraden för skatten på arbetsinkomst när den initiala effektiva marginalskattesatsen på företagsinvesteringar är positiv. I det fallet fungerar bolagsskatten dels som en skatt på arbetsinkomst, dels som en punktskatt på kapitalanvändning i inhemsk produktion. Genom att sänka den effektiva marginal-skattesatsen på investeringar till noll och ersätta intäktsbortfallet med en högre skatt på arbetsinkomst, kan beslutsfattare undvika snedvridningen i kapitalanvändningen utan att arbetare får det sämre. Med andra ord, eftersom den marginella dödviktsförlusten för bolagsskatt är högre än vad den är för skatt på arbetsinkomst, så är det effektivt att växla från den förra skatten till den senare. Eftersom bolagsskatten ändå bärs av arbetskraften uppkommer ingen negativ påverkan på inkomstfördelningen av en sådan skatteväxling.

Rekommendationen om en effektiv nollskattesats gäller dock bara på normal avkastning på företagsinvesteringar, dvs. avkastningen på den marginalinvestering som bara knappt är värd att genomföra. Såsom betonas i kapitel 4 kan inframarginella vinster som uppkommer ur geografiskt bestämd avkastning beskattas utan att investeringsincitamenten snedvrids. Kapitel 7 i rapporten förklarar hur beskattningen av normalavkastningen kan separeras från beskattningen denna avkastning i praktiken.

Som en sista observation för skattepolitiken visar känslighetsanalysen i kapitel 4 att, även om det finns avsevärda osäkerheter rörande självfinansieringsgraden för inkomstskatten på sparande, så är självfinansieringsgraden för denna skatt större eller åtminstone lika stor som för de andra skatterna, såvida inte den icke kompenserade ränteelasticiteten på sparande antar ett osannolikt stort negativt värde. Detta antyder att det svenska duala beskattningssystemet, som tillåter att den lagstadgade (marginal-) kapitalinkomstskatten är lägre än marginalskattesatsen på arbetsinkomst, främjar ekonomisk effektivitet genom att bidra till att en överdrivet hög marginell dödviktsförlust från beskattning av inkomst från sparande kan undvikas.

För tolkning av de resultat som presenteras i kapitel 4 ska bli korrekt, är det viktigt att vara tydlig vad gäller karaktären och tidshorisonten på de policyexperiment som diskuteras. De uppskattade självfinansieringsgraderna har en lång tidshorisont, där ekonomin har anpassat sig helt till förändringarna i skattesatserna. Även om vårt antagande om perfekt internationell kapitalrörlighet kan vara en rimlig uppskattning på lång sikt, kan det ta avsevärd tid för det inhemska aktiekapitalet att anpassa sig fullständigt till en förändring i skattesatser, eftersom det tillkommer kostnader för installation av fast utrustning, och eftersom företag inte enkelt kan flytta sin verksamhet och produktiva tillgångar över gränserna. På kort och mellanlång sikt är (fysiskt) kapital därför bara bristfälligt rörligt, så på kort sikt kommer en del av bördan av en källbaserad bolagsskatt på normal avkastning att bäras av ägarna till företagstillgångarna.

Vidare, vad gäller effekterna av en förändring i arbetsinkomstskatten antas i kapitel 4 en identisk förändring i marginalskattesatsen på all arbetsinkomst, från den första till den sist intjänade kronan. Här övervägs inte de specifika effekterna av att ändra marginalskattesatsen för löntagarna med högst inkomst. Som analysen i kapitel 6 tydliggör, kommer självfinansieringsgraden knuten till ett sådant policyexperiment att bli högre än självfinansieringsgraden för en generell förändring i marginalskattesatsen för hela arbetskraften.

På ett liknande sätt antas underförstått i kapitel 4, när förändringarna i marginalskattesatserna på bolagsinkomst och inkomst från sparande analyseras, att förändringarna i skattesatser tillämpas enhetligt på alla former av investeringar och sparande. I den mån en förändring i genomsnittsvärdet av den effektiva marginalskattesatsen uppkommer ur en förändring av en punktskattesats som endast tillämpas på vissa former av investeringar eller sparande, kommer ytterligare snedvridningar att uppstå som vi inte tagit med i våra beräkningar av marginella dödviktsförluster. Kapitel 7 förklarar hur dessa tillkommande effektivitetsförluster från icke-enhetlig beskattning kan kvantifieras.

Beräkningen som utvecklades i kapitel 4 för självfinansieringsgraden för en förändring i den effektiva indirekta skattesatsen på konsumtion antar likaledes att förändringen i skattesatsen tillämpas i lika grad på konsumtionen av alla varor och tjänster. Om förändringen i skattesatsen endast tillämpas på vissa varor och

tjänster uppkommer ytterligare effekter på ekonomisk effektivitet som utforskas i kapitel 5.

Kapitel 5. Skatter på konsumtion och utsläpp

Kapitel 5 tar upp utformningen av indirekta skatter, inklusive utsläppsskatter. Eftersom de inte är knutna till person, är indirekta skatter i allmänhet ett mindre bra verktyg för att omfördela inkomster jämfört med progressiva personliga inkomstskatter och riktade bidrag. Trots detta kan indirekta skatter tjäna som en användbar kompletterande inkomstkälla som gör att inkomstskatten inte ”överlastas”. Indirekta skatter är också viktiga för att internalisera negativa spridningseffekter från konsumtion och produktion (så kallade negativa externaliteter), där yttre miljöpåverkan finns med som en faktor, och de kan även underlätta problem med tunnelseende och självkontroll när det gäller vissa typer av beroendeframkallande och ohälsosam konsumtion.

Teorin om optimal beskattning tyder på att en differentierad skattestruktur för indirekta skatter kan bidra till att mildra den negativa inverkan som beskattning har på arbetsutbudet. Den information som behövs för att genomföra den i teorin optimala differentierade skattesatsstrukturen är emellertid inte tillgänglig och kommer antagligen aldrig att bli det. Av detta och flera andra skäl – bl.a. förenklad administration – anser vi att en allmän indirekt skatt, såsom momsen, bör vara lika för alla varor och tjänster. Vår kvantitativa analys tyder på att en ändring av den nuvarande differentierade svenska momsen till en enhetlig moms kan generera en ekonomisk effektivitetsvinst motsvarande mellan 0,5 och 1 procent av värdet av den totala privata konsumtionen. Samtidigt vill vi propagera för en minskad skattebörda på vissa hushållsnära tjänster som är mycket tydliga substitut för hemproducerade tjänster eller tjänster som utförs svart. En lägre effektiv skattesats på detta område skulle kunna genomföras genom skatteavdrag vid köp av hushållsnära tjänster, såsom man för närvarande gör i Sverige, eller genom direktsubventionering för maximal transparens.

När det gäller punktskatter ser vi inga skäl att göra några omfattande förändringar av de traditionella ”syndskatterna” på tobak och alkohol i Sverige. Trots att nyligen publicerade resultat från forskning om optimala syndskatter visar att mycket höga

punktskatter på tobak och alkohol kan rättfärdigas när det finns problem med självkontroll, finns det ändå mycket lite utrymme för höjd skatt på dessa produkter på grund av de svenska konsumenternas möjligheter att handla över landsgränserna.

Andra svenska punktskatter består huvudsakligen av miljörelaterade skatter. För att Sverige på ett kostnadseffektivt sätt ska kunna nå sina mål när det gäller minskade utsläpp av växthusgaser, och om det är så att Sverige är målmedvetet inställt på att uppnå de minskade utsläppsmålen oavsett vilken politik som förs i andra länder, anser vi att koldioxidskatten på företag som inte täcks av EU:s utsläppshandelssystem i princip bör vara enhetlig för alla industrier. En lägre skattesats för företag som utsätts för utländsk konkurrens skulle emellertid kunna vara försvarbart som en tillfällig åtgärd om utländska regeringar inom kort kan väntas föra en mer progressiv klimatpolitik, eftersom det då skulle finnas en långsiktigt hållbar grund för att behålla viss koldioxidintensiv produktion i Sverige. För företag som ingår i EU:s utsläppshandelssystem finns få skäl att behålla en svensk koldioxidskatt eftersom priset för kol redan fastställts på den europeiska marknaden för koldioxidrätter. Idealiskt sett bör koldioxidskatten utanför utsläppshandelssystemet motsvara det genomsnittliga priset för utsläppsrätter för att säkerställa att den totala kostnaden för att minska de svenska koldioxidutsläppen minimeras. Om koldioxidskatten då inte visar sig vara tillräcklig för att uppnå Sveriges utsläppsmål kan den svenska staten balansera detta genom att köpa utsläppsrätter och lämna över dem till Europeiska kommissionen. Om EU:s regelverk inte tillåter ett sådant kostnadseffektivt sätt att kontrollera de globala utsläppen av växthusgaser kommer kostnaden för att nå målet för minskade utsläpp att bli högre än nödvändigt.

Vår redogörelse för energiskatter visar att energiskatter som uteslutande införs av fiskala skäl endast bör påföras hushåll och dessutom koncentreras till de energiprodukter som har den minst elastisk efterfrågan för att minimera dödviktsförlusterna. Energiskatter som är inriktade på att internalisera externaliteter bör påföras företag och hushåll, och de bör återspegla de samhällsekonomiska marginalkostnader som externaliteterna skapar. Ett separat energisparmål saknar rationell ekonomisk grund, men om det ändå försvaras behöver man påföra ytterligare en "energisparskatt" på alla företag och hushåll i förhållande till deras totala energiförbrukning, oavsett i vilken form den sker. Ett

separat mål för andelen förnyelsebara energikällor i förhållande till den totala energiförbrukningen saknar på samma sätt tydlig rationell grund, då externaliteter kan korrigeras till fullo genom pigouvianska skatter på kolinnehåll och energi. Om ett sådant mål ändå uppställs, är det försvarbart med minskade (möjligen helt borttagna) energiskattesatser på förnyelsebara energikällor.

På vägtransportområdet föreslår vi att (del av) de befintliga skatterna på bensin och diesel och (vissa) av de periodiska skatterna på fordon gradvis byts ut mot ett vägavgiftssystem på lämpliga platser allteftersom den nödvändiga tekniken för detta mognar och driftskostnaderna för dessa system sjunker. Detta skulle bli en naturlig förlängning av den positiva erfarenheten från trängselskatterna som infördes i Stockholm.

Sist i kapitel 5 tar vi upp den populära hypotesen om ”dubbel vinst”, om hur en omläggning från andra skatter till miljöskatter inte bara kommer att förbättra miljön utan även skapa en ”andra vinst” i form av minskad skattesnedvridning på arbetsmarknaden. Om detta är sant kunde det motivera högre miljöskatter än vad som skulle vara försvarbart enbart med hänvisning till miljöskäl. Vi har emellertid sett att det i allmänhet inte finns någon andra vinst i form av ökad sysselsättning och icke miljörelaterad välfärd, eftersom en s.k. grön skattereform endast involverar en övergång från direkta till indirekta skatter på arbetskraft. En grön skattereform stimulerar sysselsättningen endast om den lyckas flytta skattebördan från arbetstagarna till andra grupper, men en sådan övergång kan också uppnås genom en allmän övergång från direkta till indirekta skatter som inte involverar högre miljöskatter. Gröna skattereformer bör därför genomföras för att de förbättrar miljön och inte utifrån någon förväntan om att de kommer att skapa väsentliga, icke miljörelaterade, vinster.

Kapitel 6. Skatt på arbetsinkomster

I kapitel 6 diskuterar vi den optimala utformningen av skatt på arbetsinkomst under perioder då regeringen oroar sig över ekonomisk effektivitet (den totala “storleken på kakan" som finns tillgänglig för samhället) liksom över rättvisa (fördelningen av kakan). Vi identifierar ett antal faktorer som bör beaktas om man som politiker på ett rationellt sätt vill väga fördelningsmålet mot effektivitetsmålet. Dessa faktorer inkluderar fördelningen av

skattebetalarnas intjäningsförmåga och beskattningens olika marginaleffekter på arbetsutbudet, liksom samhällets värdering av inkomstförändringar i olika inkomstgrupper.

Vi uppmärksammar särskilt att resultatet av den optimala avvägningen mellan rättvisa och effektivitet till mycket stor det beror på hur arbetsutbudet påverkas vid en förändring av skattesatserna. Om arbetskraftsdeltagandet är okänsligt för ekonomisk stimulans medan arbetsinsatsen hos dem som redan har anställning inte är det, ser vi att det optimala skattetransfereringssystemet i ett rättvist samhälle omfattar generösa transfereringar till människor utanför arbetsmarknaden i kombination med en snabb utfasning av transfereringar till låginkomsttagare när de höjer sin arbetsinkomst.

Om, å andra sidan, arbetskraftsdeltagandet i hög utsträckning svarar på nettoinkomstökningar vid sysselsättning, medan insatsen från dem som redan har en anställning inte är särskilt känslig för sänkt skatt på den sista intjänade kronan, kan det vara optimalt att uppmuntra arbetskraftsdeltagandet genom ett jobbskatteavdrag även om det bortfall i skatteintäkter, som blir resultatet, kommer att kräva högre marginalskatter än vad som annars skulle behövas. Med tanke på den stora osäkerhet som råder då det gäller marginalskatternas påverkan på arbetsutbudet, liksom den osäkerhet som råder när det gäller de fördelningspolitiska målen, är det svårt att uppskatta vilken samhällsekonomisk vinst eller förlust som kan göras genom att arbetsinkomstskatten omfördelas mellan olika skattebetalare. Vår analys antyder emellertid att den mycket höga marginalskatten, som motsvarar omkring 75 procent i de övre inkomstskikten, även vid ganska återhållsamma antaganden om beteendemässiga reaktioner, medför att ett avskaffande av värnskatten, som lags på höginkomsttagare, mer än väl skulle betala sig själv genom skattebasens dynamiska ökning. Vid en sådan situation behöver man inte göra någon avvägning mellan rättvisa och effektivitet, eftersom nettoinkomstökningen kommer att göra det möjligt för regeringen att låta alla få det bättre. Vår analys leder oss därför till att föreslå att värnskatten avskaffas.

Trots osäkerheten när det gäller skattebasens känslighet vid sänkt marginalskatt, är riskerna som förknippas med ett sådant politiskt experiment begränsade på grund av de relativt låga intäkter som värnskatten genererar. Dessutom, till skillnad från tidigare resultat, visar vår analys att graden av självfinansiering vid ett avskaffande av värnskatten skulle bli högre än den

självfinansieringsgrad som förknippas med höjd inkomsttröskel för den progressiva statliga inkomstskatten eller höjt inkomsttak för socialbidrag.

Vår beskrivning av dagens skatteregler visar att jobbskatteavdraget liksom grundavdraget varierar med inkomsten på ett så komplicerat sätt att det kan vara svårt att förstå för den vanlige skattebetalaren. Vi noterar särskilt att grundavdraget minskar beräkningsgrunden för jobbskatteavdraget på ett sätt som neutraliserar effekten av att grundavdraget är inkomstrelaterat för inkomsttagare. Följaktligen har grundavdragets koppling till inkomstnivå bara betydelse för genomsnittsskatten för bidragstagare, eftersom transfereringar påverkar beräkningsgrunden för det inkomstrelaterade grundavdraget. Det senare antyder att en förändring av skattebetalarens transfereringsinkomster kan påverka storleken av hans/hennes jobbskatteavdrag på ett sätt som kanske inte är uppenbart för honom/henne. Till följd av denna komplexitet är incitamenten som ligger inbäddade i marginalskattesystemet antagligen svåra för skattebetalare att förstå, och därmed kanske man inte reagerar (fullt ut) på incitamenten på det sätt som politikerna avsett. Eftersom grundavdragets effekt på inkomsttagarnas genomsnitts- och marginalskatt helt sätts ur spel genom det sätt på vilket jobbskatteavdraget utformats, är det önskvärt att förenkla den personliga inkomstskatten på arbete genom att byta ut nuvarande inkomstrelaterade grundavdrag med ett identiskt ”platt” avdrag för alla skattebetalare. Följderna av denna förenkling för bidragstagares inkomstfördelning kan behöva motverkas genom lämpliga justeringar av transfereringsnivåerna.

Kapitel 7: Beskattning av inkomster från sparade medel och investeringar

Hur ett land allokerar sparande och investeringar kan få viktiga konsekvenser för levnadsstandarden. Om skattesystemet gör att kapital kanaliseras till lågproduktiv användning, kommer nationalinkomsten att vara lägre än vad den skulle kunna vara. Kapitel 7 identifierar ett antal skatterelaterade snedvridningar i Sveriges spar- och investeringsmönster. De viktigaste snedvridningarna i sparmönstret härrör från den generösa beskattningen av pensionssparande och sparande i eget boende. Skattelättnaderna till dessa besparingsformer beräknas generera en

total dödviktsförlust motsvarande cirka 6,5 – 10,5 miljarder kronor, i 2008 års priser. Uppskovet av kapitalvinstskatten till realisationstidpunkten orsakar ytterligare snedvridning genom att en skattepreferens genereras för tillgångar vars avkastning huvudsakligen ackumuleras i form av kapitalvinst och genom att hämma portföljfördelning till förmån för tillgångar med en högre samhällsekonomisk avkastning (före skatt).

På investeringssidan fungerar den källbaserade inkomstbeskattningen av företagen (huvudsakligen bolagsskatten) som en kombination av skatt på arbetsinkomst och skatt på kapitalanvändning i inhemsk produktion. Bolagsskatten tenderar därför att orsaka större snedvridning än skatt på förvärvsinkomst. Vidare orsakar skatten på företagsinkomster ytterligare snedvridning när det gäller valet mellan alternativa företagsformer, mellan skulder och kapital och mellan kortfristiga och långfristiga tillgångar. Vi beräknar att den kombinerade dödviktsförlusten på grund av skattesnedvridningarna beträffande valet av olika organisationsformer och när det gäller skulder – kapital kan uppgå till mer än 32 miljarder kronor i 2008 års priser - en enorm snedvridning jämfört med bolagsskatteintäkterna på 83 miljarder kronor det året.

För att åtgärda ineffektiviteterna när det gäller beskattning av inkomst på sparade medel, föreslår vi följande reformåtgärder:

- Beskatta all avkastning på finansiellt sparande (inklusive avkastning på institutionellt sparande) med en gemensam skattesats på 25 procent.
- Ersätt den nuvarande kommunala fastighetsavgiften, kapitalvinstskatten på eget boende och stämpelskatten på fastighetstransaktioner med en platt fastighetsskatt på 1 procent, baserat på en realistisk bedömning av fastighetens marknadsvärde.
- Beskatta alla reavinster för börsnoterade aktier med en periodiseringsmetod och beskatta ej realiserad vinst på onoterade aktier som uppstår till följd av innehållande av företagets vinst löpande, där företaget åläggs att betala skatten å aktieägarens vägnar.

Genom att ersätta den existerande fastighetsavgiften med en skatt på 1 procent på det beräknade fastighetsvärdet, skapas en praktiskt taget neutral skattebehandling av finansiellt sparande och sparande som investerats i eget boende, om man räknar med en kapital-

vinstskatt på 25 procent. De ökade intäkterna från de två första åtgärderna ovan beräknas bli cirka 17 miljarder kronor i 2008 års priser.

För att minska skattesnedvridningen beträffande investeringarnas nivå och mönster, föreslår vi en företagsskattereform i enlighet med det följande:

- Inför ett s.k. "Allowance for Corporate Equity – ACE" (avdrag för uppskattad ersättning för eget kapital) i form av ett avdrag för en kalkylmässig normal avkastning på eget kapital.
- Reformera 3:12-reglerna så att all inkomst upp till ett tak, som ges av normalavkastning på eget kapital (ACE), endast taxeras en gång vid skattesatsen för kapitalinkomster, oavsett om den betalas ut (realiseras som kapitalvinst) eller ej. Inkomst utöver normal avkastning bör beskattas som arbetsinkomst när den realiseras i form av utdelning eller kapitalinkomst, med avdrag för den bolagsskatt som redan betalats.
- Lätta på reglerna för kvittning av företagsförluster, t.ex. genom att möjliggöra kvittning av företagsförluster mot andra skatteförpliktelser för samma år, t.ex. moms, källskatt och förmånsbeskattning.
- Reducera bolagsskatten från den gällande skattesatsen på 26,3 procent till 25 procent, motsvarande den föreslagna skatten på kapitalinkomster.

Vår analys visar att införande av ett avdrag för uppskattad ersättning för eget kapital (ACE) i princip skulle eliminera skattesnedvridningen när det gäller valet mellan skuld och kapital och mellan olika företagstillgångar. Det skulle också eliminera snedvridningen när det gäller valet mellan arbete och kapital i den (lilla öppna) svenska ekonomin. Den föreslagna reformen av 3:12-reglerna skulle tillförsäkra en huvudsakligen identisk skattebehandling av fåmansbolag och enmansföretag, och därigenom eliminera snedvridningen när det gäller valet mellan dessa två närliggande företagsformer.

Inkomstförlusten till följd av ett ACE-avdrag för bolagskapital beräknas till 8 till 9 miljarder kronor i 2008 års priser och sänkningen av bolagsskatten från 26,3 till 25 procent beräknas generera ytterligare minskade inkomster med cirka 4 miljarder

kronor. Enligt våra beräkningar skulle den totala inkomstminskningen till följd av en bolagsskattereform enkelt finansieras av de föreslagna ändringarna i inkomst från sparade medel.

Förslagen i sammanfattning

Analysen i denna rapport visar att den långsiktiga levnadsstandarden i Sverige skulle kunna höjas utan att försämra de offentliga finanserna, genom en omfattande skattereform som återinför och ytterligare utvecklar de sunda principerna om skatteneutralitet och enhetlighet som låg till grund för 1991 års stora skattereform. Närmare bestämt förslår vi en reform som innehåller följande element:

Indirekt beskattning

- Momsen bör vara densamma på alla varor och tjänster. En enhetlig momssats kunde fastställas till en nivå som genererar samma nettoinkomster som i dag. Det skulle endast behövas en mindre offentlig utgift för att kompensera sårbara låginkomstgrupper för momshöjningen på mat.
- Energiskatter som enbart är fiskala bör endast tas ut på hushåll och bör koncentreras till energiprodukter för vilka efterfrågan är mest oelastisk. Energirelaterade skatter som är ägnade att motverka negativa miljöeffekter bör läggas på företag och hushåll och bör reflektera de samhälleliga marginalkostnaderna som inkluderar negativa externaliteter.
- Existerande drivmedelsskatter kan gradvis ersättas av vägtullar på relevanta platser, allteftersom nödvändig teknik utvecklas och kostnaderna för användning av sådana system sjunker.

Skatt på arbetsinkomst

- Värnskatten bör avskaffas. Även med konservativa antaganden när det gäller skattebetalarnas reaktioner på skattesatser, är det sannolikt att värnskatten orsakar en nettoförlust för statsinkomsterna när dess negativa effekt på skattebasens storlek beaktas.

- De aktuella reglerna för beräkning av jobbskatteavdraget interagerar med reglerna för grundavdraget på ett ytterst komplicerat sätt, vilket sannolikt försvagar den positiva incitamentseffekt som jobbskatteavdraget kan ha. Reglerna skulle kunna förenklas genom att man ersätter det aktuella inkomstbaserade grundavdraget med ett identiskt enhetligt avdrag för alla skattebetalare.

Beskattning av inkomst av sparade medel och investeringar

- Jämställ skattesatsen på beräknad avkastning på pensionssparande (avkastningsskatten) med den vanliga skattesatsen för personlig kapitalinkomst till 25 procent.
- Ersätt den nuvarande kommunala fastighetsavgiften, stämpelskatter och kapitalvinstskatt på eget boende med en ny fastighetsskatt på 1 procent, beräknad på en realistisk fastighetsvärdering.
- Jämställ bolagsskatten med kapitalinkomstskatten, till en nivå på 25 procent.
- Införande av ett avdrag för uppskattad ersättning för eget kapital (ACE - Allowance for Corporate Equity) i form av ett avdrag för beräknad normalavkastning på eget kapital för företag.
- Reformera 3:12-reglerna för att säkra att inkomst upp till ett tak som anges av normalavkastningen på eget kapital (ACE) endast beskattas en gång med skattesatsen för kapitalinkomster och att inkomst över denna nivå beskattas på samma sätt som inkomst för enskilda firmor.
- Lätta på reglerna för kvittning av företagsförluster.

Tabell 8.1 sammanfattar effekterna av de viktigaste reformförslagen på de totala skatteintäkterna och på ekonomisk effektivitet. Den första kolumnen visar så kallad statisk inkomsteffekt, definierat som effekterna på skatteintäkterna under förutsättning att skattebetalarna inte ändrar sitt beteende till följd av de förändrade skattereglerna. Man kan se att reformförslagen i detta fall skulle vara i princip intäktsneutrala och endast generera en liten nettoökning av skatteintäkterna på ca 500 miljoner kronor.

Kolumn 2 och 3 redovisar de s.k. dynamiska inkomsteffekterna, d.v.s. effekterna på skatteintäkterna som orsakas av beteendeförändringar till följd av de nya skattereglerna. De dynamiska inkomsteffekterna visar även följderna som ändringen av skattereglerna får på den ekonomiska effektiviteten. Om exempelvis en skattebetalare reagerar på en lägre skattesats genom att arbeta mer, kommer de ökade skatteintäkterna som genereras av detta extra arbete att skapa en välfärdsvinst för samhället, eftersom det ger mer offentliga medel som kan användas till förmån för alla skattebetalare (jämförelsevis är den "dynamiska" ökningen i skattebetalarens egen inkomst efter skatt inte en nettovälfärdsvinst eftersom den endast kompenserar skattebetalaren för det extra arbetet).

Kolumn 2 i tabell 8.1 visar de dynamiska intäktsökningar som uppstår till följd av en övergång till enhetlig/neutral beskattning inom de olika områdena. Den föreslagna fastighetsskatten har satts så att bostadstjänster kommer att beskattas med i princip samma skattesats som alla andra varor och tjänster. Vidare kommer, som förklaras i kapitel 7, införandet av ett avdrag för uppskattad ersättning för eget kapital att innebära att alla företagsinvesteringar beskattas med samma effektiva marginalskattesats oavsett om de finansieras med lån eller egna tillgångar och oavsett i vilken typ av tillgång företaget investerar. I det nuvarande skattesystemet måste högt beskattade aktiviteter ha ett relativt högt värde för att kunna konkurrera med lågt beskattade aktiviteter. En övergång till enhetlig beskattning innebär därför att konsumenter och företag övergår från aktiviteter med lågt värde till aktiviteter med högre värde. Som en följd av detta ökar beskattningsunderlaget och generar således den "dynamiska" intäktsökning som anges i kolumn 2. Storleken på denna ökning beror på i vilken utsträckning som konsumenterna är beredda att ändra sitt konsumtionsmönster och i vilken utsträckning företagen är villiga att ändra sitt val av produktionsteknologi och strategi för investeringsfinansiering till följd av de ändringar i relativa priser och kostnader som skatteförändringarna medför. Denna påverkbarhet hos skattebetalarnas beteende till följd av ändringar i relativa priser och kostnader ges av olika s.k. substitutionselasticiteter, vars värden är behäftade med en hel del osäkerhet. Beräkningarna i kolumn 2 i tabell 8.1 baseras på substitutionselasticiteter som bedöms vara sannolika med beaktande av empirisk ekonomisk forskning, men

det måste dock understrykas att siffrorna är tämligen preliminära, med hänsyn till den begränsade kunskapen om deras exakta storlek.

Med detta viktiga förbehåll, visar den andra kolumnen i tabell 8.1 att de åtgärder som föreslås för en övergång till enhetlig beskattning skulle medföra en långsiktig intäktsökning motsvarande mer än 27 miljarder kronor när skattebetalarna anpassat sitt beteende till det nya skattesystemet. Denna intäktsökning kommer endast att ackumuleras gradvis, eftersom det kommer att ta tid för skattebetalarna att anpassa sina konsumtions-, spar- och investeringsmönster. Den enhetliga beskattningen av skulder och tillgångar som tillförsäkras genom ett avdrag för uppskattad ersättning för eget kapital (ACE) beräknas generera en dynamisk intäktsökning på över 7 miljarder kronor när företagen övergår från skuldfinansierade investeringar med relativt låg avkastning före skatt till investeringar finansierade med eget kapital med högre avkastning före skatt. Därutöver genererar den högre genomsnittliga produktiviteten hos företagsinvesteringar som tillförsäkras genom ACE en ytterligare ökning på mer än 21 miljarder kronor av privata inkomster efter skatt, varför den totala effektivitetsökningen som ett resultat av en mer produktiv allokering av företagets kapital beräknas bli cirka 27,5 miljarder kronor.

Tabell 8.1 Effekter av de viktigaste reformförslagen på statens inkomster och ekonomisk effektivitet, (miljarder kronor, 2008 års priser)

Reform förslag	*1. Statistisk intäkts effekt*	*Dynamiska intäktseffekter (effektivitetseffekter)*			*5. Total netto-effekt på intäkter*
		2. Effekt av övergång till enhetlig beskattning	*3.Effekt av ändrad skattesats*	*4.Total dynamisk intäktseffekt*	
Övergång till enhetlig moms	0	+9.4[2]	0	+9.4	+9.4
Avskaffning av värnskatt	-3.3[1]	0	+3.1[6,a] to +6.2[6,b]	+3.1 to +6.2	-0.2 to +2.9
Övergång till enhetlig beskattning på 25 % av inkomster från sparade medel	+3.0	+3.4[3]	-0.8[7,a] to -1.1[7,b]	+2.3 to +2.6	+5.3 to +5.6
Ändrad fastighetsskatt	+13.8	+7.4[4]	-1.1[8,a] to -2.2[8,b]	+5.2 to +6.3	+19.0 to +20.1
Avdrag för uppmätt eget kapital (ACE)	-9.0	+7.2[5]	+1.6[9,a] to +2.7[9,b]	+8.8 to +9.9	-0.2 to +0.9
Sänkt bolagsskatt till 25 %	-4.0	0	+0.7[9,a] to +1.2[9,b]	+0.7 to +1.2	-3.3 to -2.8
Total effekt	+0.5	+27.4	+3.5[a] to +6.8[b]	+30.9 to +34.2	+31.4 to +34.7

1. Nettointäktsförlust efter ökning i konsumtionsskatteintäkter. Bruttointäktsförlusten är 4,4 miljarder kronor.

2. Beräknat med formel (B.4) i kapitel 5.

3. Beräknat med formel (B.9) i kapitel 7.

4. Beräknat med formler (B.18) och (B.23) i kapitel 7.

5. Beräknat som en bolagsskattesats på 25 % gånger ackumulerad produktivitetsökning på 28,6 miljarder kronor som beräknas följa på en neutral skattebehandling av skulder och tillgångar (se kapitel 7).

6. Beräknat med formel (B.13) i kapitel 6.

7. Beräknat som självfinansieringsgrad för skatt på inkomster från sparade (kapitel 4) multiplicerat med den statiska intäktseffekten i kolumn 1.

8. Beräknat som självfinansieringsgrad för konsumtionsskatten (kapitel 4) multiplicerat med den statiska intäktseffekten i kolumn 1.

9. Beräknat som självfinansieringsgrad för bolagsinkomstskatten (kapitel 4) multiplicerat med den statiska intäktseffekten i kolumn 1.

a. Med antagande av en elasticitet i beskattningsbar inkomst motsvarande 0,1 b. Med antagande av en elasticitet i beskattningsbar inkomst motsvarande 0,2.

Källa: Författarens beräkningar, baserat på analys i kapitel 4 - 7.

Kolumn 3 i tabell 8.1 visar de beräknade dynamiska intäktseffekter som uppstår då skattebetalarna ändrar sitt beteende som en reaktion på beskattningsnivån som anges i tabellens första kolumn. Övergången till enhetlig moms genererar ingen effekt på intäkter av detta slag eftersom momsen har satts så att den genomsnittliga momsen ska vara oförändrad. I skattesystemets övriga delar avgörs de dynamiska effekterna av den ändrade beskattningsnivån av elasticiteten i den beskattningsbara inkomsten (som mäter

känsligheten för en förändring i den effektiva marginalskatten). Denna elasticitet reflekterar alla sorters beteendereaktioner på beskattning, t.ex. förändringar arbetskraftsutbudet, utbildning. besparingar och investeringar samt förändringar i skatteplaneringsaktiviteter och skatteflykt, osv. De lägre siffrorna i kolumn 3 baseras på ett konservativt antagande om att elasticiteten i den beskattningsbara inkomsten endast är 0,1, vilket innebär en ökning på 0,1 procent av den marginella inkomsten efter skatt.

De nyligen genomförda empiriska studier som granskats i kapitel 4 antyder emellertid att ett mer realistiskt värde för elasticiteten i den beskattningsbara inkomsten i Sverige skulle vara 0,3 eller 0,4. Men för att inte riskera att överskatta effekterna baseras beräkningarna av de högre siffrorna i kolumn 3 i tabell 8.1 på en elasticitet i den beskattningsbara inkomsten på 0,2 vilket är något återhållsamt med hänsyn till de senaste empiriska skattningarna för Sverige. Hur som helst, ser vi att även med den låga elasticiteten på 0,1, kommer den dynamiska ökningen av nettointäkter på grund av skattebetalarnas reaktioner på ändringarna i beskattningsnivån att vara cirka 3,5 miljarder kronor. Den höjda fastighetsskatten kommer att höja boendekostnaden och kommer därför att delvis fungera som en höjd konsumtionsskatt som urholkar reallönerna och därigenom hämmar arbetskraftsutbudet. Detta är skälet till den beräknade dynamiska intäktsförlusten till följd av fastighetsskattereformen i kolumn 3 i tabell 8.1. Observera att denna förlust är lägre än den dynamiska intäktsökningen på grund av övergången till en enhetlig beskattning av boende och andra konsumtionsformer (jämför kolumner 2 och 3), varför resultatet blir att fastighetsskattereformen förbättrar den ekonomiska effektiviteten. Möjligen skulle man också kunna förvänta sig en dynamisk intäktsförlust till följd av att den högre fastighetsskatten minskar underlaget för fastighetsbeskattning genom att försvaga incitamentet att investera i eget boende. Denna intäktsförlust återhämtas dock genom ökade intäkter på grund av skatten på inkomst av sparande, eftersom skattebetalarna ökar sitt finansiella sparande på bekostnad av investeringar i boende. Eftersom den effektiva beskattningen på finansiellt sparande och boendeinvesteringar är densamma efter fastighetsskattereformen, har denna förändring i fördelningen av hushållens tillgångar ingen nettoeffekt på statens intäkter.

Den fjärde kolumnen i tabell 8.1 summerar helt enkelt de dynamiska intäktseffekterna i kolumnerna 2 och 3. Som tidigare

nämnts, är denna dynamiska intäktsökning en indikator på den ökade ekonomiska effektivitet som genereras av skattereformen. Vi kan se att den totala beräknade ökningen uppgår till mer än 30 miljarder kronor, motsvarande ungefär 1 procent av BNP. Även med beaktande av den avsevärda osäkerheten beträffande de olika elasticiteter som beskriver skattebetalarnas beteende, pekar denna beräkning på att den föreslagna omstruktureringen av det svenska skattesystemet avsevärt skulle förbättra den svenska ekonomins funktionsförmåga.

Den femte och sista kolumnen i tabell 8.1 lägger ihop de statiska och dynamiska intäktsökningarna för att få ett mått på den totala nettointäktsökningen till följd av reformen. Nettointäktseffekten av reformpaketet reflekterar nästan helt den dynamiska intäktsökningen som kan användas på olika sätt. Till exempel skulle regeringen kunna minska den offentliga sektorns skuldsättning för att förbättra den långsiktiga hållbarheten i de offentliga finanserna. Man skulle kunna öka utbudet av offentliga tjänster eller transfereringar till utvalda grupper eller så skulle man kunna sänka skatterna. Om det sistnämnda alternativet väljs, är det givetvis viktigt att skatterna sänks på ett sätt som inte äventyrar de principer om skatteneutralitet och enhetlighet som gav upphov till intäktsökningarna från första början. Eftersom storleken på de dynamiska intäktsökningarna är svår att förutsäga och endast materialiseras gradvis över tid, bör de inte spenderas förrän de faktiskt ackumulerats.

Sker effektivitetsökningen på bekostnad av en rättvis fördelning?

Det är naturligt att ställa sig frågan om de stora vinsterna när det gäller ekonomisk effektivitet som redovisas i tabell 8.1 kan erhållas utan att skapa en mer ojämn inkomstfördelning? I sig självt gynnar förslaget att avskaffa värnskatten uppenbart de rikaste skattebetalarna som för närvarande betalar denna skatt. Enligt beräkningar av Finansdepartementet skulle denna del av reformen öka den genomsnittliga disponibla inkomsten för de rikaste 10 procenten av skattebetalarna med 5 575 kronor per år (2010 års prisnivå), och samtidigt skulle nettoinkomsten för övriga skattebetalare förbli oförändrad. Analysen i kapitel 6 pekar emellertid på att den dynamiska intäktsökningen till följd av ett avskaffande av värnskatten med största sannolikhet skulle överskrida den statiska intäktsförlusten. I så fall skulle alla skattebetalare gynnas, trots att inkomstfördelningen skulle bli

mindre jämn. För att motverka tendensen till större ojämlikhet skulle regeringen kunna välja att spendera nettointäktsökningen på ett sätt som gynnar låginkomsttagare.

Den tredje kolumnen i tabell 8.2 nedan visar hur den föreslagna sänkningen av den generella skattesatsen på kapitalinkomst skulle påverka den genomsnittliga disponibelinkomsten vid olika inkomstnivåer. Tabellen delar in skattebetalarna i tio inkomstgrupper (deciler) efter storleken på deras taxerade förvärvsinkomst (= inkomst av arbete + inkomst från transfereringar). I inkomstdecil 1 finns den 10-procentiga andel av skattebetalarna som har de lägst inkomster och i decil 10 den 10-procentiga andel som har högst inkomster. Vi ser i tabell 8.2 att sänkningen av kapitalinkomstskatten kommer att få en mycket begränsad effekt på de disponibla inkomsterna. I procentuella termer uppstår de största förändringarna i den lägsta och den högsta decilen. I den första decilen finns många pensionärer med begränsade förvärvsinkomster, men med icke-försumbara kapitalinkomster från besparingar som ackumulerats under deras yrkesliv. Den höga andelen kapitalinkomst förklarar varför skattebetalarna i denna grupp upplever den största procentuella förändringen i sin genomsnittliga disponibla inkomst (0,75 procent). Skattebetalarna i den högsta decilen är fortfarande aktiva på arbetsmarknaden men har normalt kunnat samla på sig betydande förmögenheter på grund av höga löneinkomster. I genomsnitt kommer dessa skattebetalare att uppleva en ökad disponibel inkomst på 0,6 procent. För övriga inkomstgrupper kommer sänkningen av skatten på kapitalinkomster att ha en försumbar effekt på disponibel inkomst, eftersom de vanligen har förhållandevis små nettoinkomster från kapital, samtidigt som deras positiva inkomst från kapital mer eller mindre kvittas mot deras avdrag för ränteutgifter.

Observera att siffrorna i tabell 8.2 inte inkluderar effekten av den föreslagna höjningen av skatten på (beräknad) inkomst från pensionssparande (avkastningsskatten) från 15 till 25 procent. Detta element i skattereformpaketet kommer sannolikt att få en progressiv fördelningseffekt, eftersom låginkomstgrupperna pensionssparar mycket lite för att komplettera den allmänna pensionen. Figur 8.1 illustrerar förhållandet mellan förvärvsinkomst och privat pensionssparande (således inkluderas inte tjänstepensionsplaner i enlighet med kollektivavtal). Figuren visar

att enskilt pensionssparande huvudsakligen görs av höginkomsttagare.

Tabell 8.2 Fördelningseffekter av den föreslagna förändringen i beskattning av kapitalinkomster och fastigheter (2010 års inkomstnivåer)

Inkomst decile	*Genomsnittlig förvärvsinkomst före skatt*[1]	*Genomsnittlig enskild disponibel inkomst*	*Förändring i enskild disponibel inkomst*[2] *till följd av*	
			sänkt kapitalinkomstskatt från 30% to 25%	*höjning av fastighetsskatten till 1%*[3]
1	24 309	67 081	500 (0.75%)	-655 (-0.98%)
2	98 764	107 879	356 (0.33%)	-503 (-0.47%)
3	141 439	133 625	551 (0.41%)	-893 (-0.67%)
4	178 338	153 765	293 (0.19%)	-1092 (-0.71%)
5	212 513	179 144	306 (0.17%)	-1592 (-0.89%)
6	246 216	206 959	207 (0.10%)	-1875 (-0.91%)
7	280 306	232 682	139 (0.06%)	-1925 (-0.83%)
8	320 125	264 526	175 (0.07%)	-2669 (-1.01%)
9	379 304	312 495	483 (0.15%)	-3852 (-1.23%)
10	620 204	487 182	2889 (0.59%)	-6979 (-1.43%)

[1] Genomsnittligt värde för taxerad förvärvsinkomst.

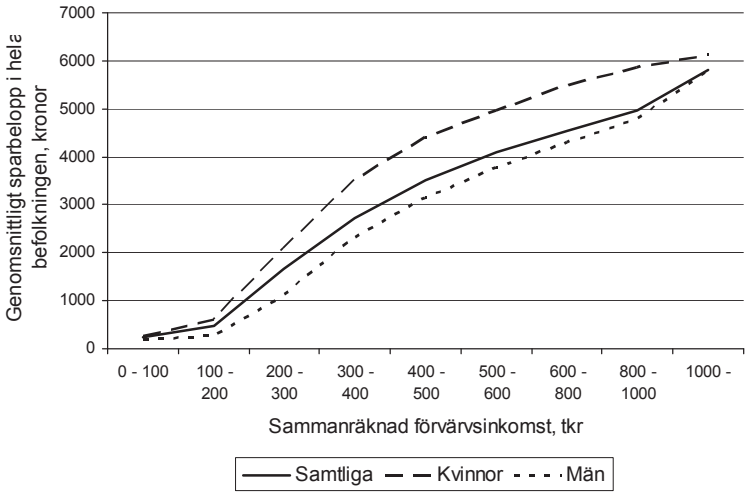
[2] Siffrorna utan parentes är absoluta förändringar i kronor. Siffrorna inom parentes är procentuell förändring i genomsnittlig enskild disponibel inkomst.

[3] Fastighetsskatten antas beräknas som 1 % av rimligt marknadsvärde, vilket motsvarar 4/3 av aktuellt taxeringsvärde. Siffrorna reflekterar den höjda fastighetsskatten på småhus, ej medräknat bostadsrätter och lantbruk.

Källa: Beräkningarna baseras på FASIT-modellen som utvecklats av Finansdepartementet.

Det bör även understrykas att tabell 8.2 inte inkluderar effekterna av den förslagna skärpningen av reavinstbeskattningen på aktier, med ett slopande av dagens uppskov med beskattningen till vinsten realiseras. Realisationsvinster på aktier är en viktig del av de totala reavinsterna vilka fördelas mycket ojämnt över skattebetalarna. Exempelvis hade skattebetalare med en förvärvsinkomst mellan 280 000 och 300 000 kronor 2007 genomsnittliga realisationsvinster på cirka 17 400 kronor. Skattebetalare med förvärvsinkomster mellan 500 000 och 1 000 000 kronor hade realisationsvinster på cirka 71 500 kronor, medan de med förvärvsinkomster över 1 000 000 hade genomsnittliga realisationsvinster på 512 600 kronor (Skattestatistisk årsbok 2009, sid. 124). Dessa siffror antyder att en åtstramning av reavinstbeskattningen kommer att vara mycket progressiv i sin fördelningseffekt, och därmed uppväga fördelningseffekten av att värnskatten avskaffas.

Figur 8.1. Fördelning av privat pensionssparande, 2008[1]



[1] Fördelning över hela befolkningen.

Källa: Bergström et al. (2010, figur 3.3)

Vidare visar den sista kolumnen i tabell 8.2 att den föreslagna höjningen av fastighetsskatten till 1 procent av aktuellt marknadsvärde tenderar att medföra en större procentuell sänkning av disponibel inkomst, ju högre förvärvsinkomst skattebetalaren har. Ett undantag från denna regel är den första decilen som inkluderar många pensionärer med låg förvärvsinkomst i förhållande till värdet på deras egendom. För den lägsta decilen ser vi emellertid att den genomsnittliga absolut ökningen av den årliga fastighetsskatten blir förhållandevis liten, 655 kronor. För den genomsnittlige skattebetalaren i den första decilen, uppvägs denna höjning av fastighetsskatten av en sänkning av skatten på kapitalinkomster på cirka 500 kronor. Jämförelsevis ser vi i tabell 8.2 att för skattebetalarna i de övre inkomstdecilerna blir effekterna av fastighetsskattehöjningen avsevärt större än effekterna av kapitalinkomstskattesänkningen.

Förutom höjningen av fastighetsskatten, innebär den föreslagna skattereformen också att stämpelskatten samt reavinstbeskattningen vid försäljning av eget boende avskaffas, varför siffrorna i den sista kolumnen i tabell 8.2 överdriver skattehöjningen för villaägare. Generellt anger ovanstående siffror att

nettoeffekten på inkomstfördelningen till följd av avskaffandet av värnskatten och förändringarna i de olika kapitalskatterna kommer att vara ganska liten, eftersom många av effekterna tenderar att ta ut varandra och eftersom den totala skatteomfördelningen är begränsad.

Denna slutsats kommer sannolikt inte att ändras när vi beaktar fördelningseffekterna av den föreslagna reformen på bolagsbeskattningen. Man skulle kunna tro att avdraget för uppskattad ersättning för eget kapital (ACE) och den (lilla) sänkningen av bolagsskatten till 25 procent endast skulle gynna aktieägare. I en liten öppen ekonomi som Sverige, tenderar emellertid en skatt på normalavkastning från inhemska företagsinvesteringar att på lång sikt helt flyttas över på arbetarna genom minskade investeringar som urholkar reallönerna genom att minska arbetskraftens produktivitet (detta förklaras i kapitel 4 och 7). Genom att eliminera skatten på normalavkastning av bolagsinvesteringar på företagsnivån, eliminerar avdraget för uppmätt kapital denna produktivitetssänkande effekt och skapar utrymme för högre reallöner. På lång sikt skulle fördelningen av fördelarna med avdraget för uppskattad ersättning för eget kapital därför mer eller mindre överensstämma med nuvarande fördelning av arbetsinkomst.

Den måttliga sänkningen av bolagsskatten kommer att fungera som en kombinerad sänkning av skatten på normalavkastning och skatten på vinster som är "högre än normala" som härrör från inhemsk investering. Den första delen av skattesänkningen fungerar på samma sätt som avdraget för uppskattad ersättning för eget kapital och kommer därför att gynna löntagarna på lång sikt. Sänkningen av skatten på vinster över de normala kommer att gynna företagsägare i större utsträckning, men även denna del av skattesänkningen kommer att medföra en viss ökning av inhemska investeringar så att en del av de långsiktiga fördelarna även tillfaller inhemska arbetare. Under alla omständigheter är effekterna små, på grund av att förändringen av bolagsskatten är liten.

På kort sikt kommer avdraget för uppskattad ersättning för eget kapital och sänkningen av bolagsskatten att medföra aktievinster som kommer att omfördela inkomsterna till förmån för inhemska aktieägare. Den föreslagna reformen av reavinstbeskattningen kommer emellertid medföra att dessa vinster beskattas omedelbart då de ackumuleras, till skillnad mot nuvarande reavinstbeskattning

som möjliggör ett uppskjutande av skatten tills dess att vinsten realiseras.

Vid utvärdering av fördelningseffekterna av förslagen, är det även viktigt att hålla i åtanke att övergången till större enhetlighet och neutralitet i beskattningen kommer att bredda skatteunderlaget vilket möjliggör ytterligare inkomster för staten, utan någon förändring av skattesatsen. Om beslutsfattarna anser att det finns ett behov att kompensera för vissa av de fördelningseffekter som skatteändringen skulle medföra, kan dessa extra intäkter riktas till vissa behövande grupper genom målinriktade överföringar eller skattesänkningar. Mer generellt kan sägas att ett skattesystem med ett brett beskattningsunderlag som kan ta in avsevärda intäkter med en låg förlust i termer av ekonomisk effektivitet, är det bästa sättet att skydda de arrangemang i välfärdsstaten som säkerställer en rättvis inkomstfördelning.

1 The Swedish tax system in international context

For many years Sweden has competed with Denmark for the status as the country with the highest ratio of tax revenue to GDP in the world. As shown in Table 1.1, both countries collect total revenues amounting to about half of GDP, whereas tax revenue in the typical western European EU country only makes up around 40 percent of GDP.

International observers sometimes wonder how the Scandinavian countries manage to have well-functioning market economies despite the apparently stifling level of taxation. Part of the answer may be that the OECD revenue figures displayed in Table 1.1 tend to overstate the differences between the tax burdens in Scandinavia and elsewhere. The reason is that the bulk of public transfers is subject to personal income tax in countries like Sweden and Denmark, whereas transfers are often tax-free (but correspondingly lower) in many other countries. Whether a transfer of 100 is taxed at a rate of 50 percent or whether the beneficiary simply receives a tax-free net transfer of 50 clearly makes no difference from an economic viewpoint. However, in the former case the tax burden as measured by the OECD will be higher than in the latter case. Another factor complicating a cross-country comparison of tax burdens is that many OECD countries have a tradition of supporting families with children through special deductions from the personal income tax base whereas the Scandinavian countries tend to rely on direct transfers to such families combined with generous day care subsidies. Again, the Scandinavian form of support tends to result in a higher recorded tax burden.

A further reason why the high tax burden has not prevented Sweden from attaining a high level of prosperity may be that taxes in Sweden tend to be quite broadly based, thus helping to keep

down the marginal rates of tax that distort economic incentives. Indeed, the benefits of broad tax bases are a main theme of this report which will argue that although the Swedish tax system has so far been relatively robust, there is room for further improvement by sticking more consistently to the principles of the great "Tax Reform of the Century" undertaken in 1990.

Table 1.1 Total tax revenue as a percentage of GDP, 1975-2007

	1975	1985	1990	1995	200	2005	2006	2007
Canada	32.0	32.5	35.9	35.6	35.6	33.4	33.3	33.3
Mexico[3]		17.0	17.3	16.7	18.5	19.9	20.6	18.0
United States	25.6	25.6	27.3	27.9	29.9	27.3	28.0	28.3
Australia	25.8	28.3	28.5	28.8	31.1	30.8	30.6	30.8
Japan	20.9	27.4	29.1	26.8	27.0	27.4	27.9	26.5
Korea	15.1	16.4	18.9	19.4	23.6	25.5	26.8	28.7
New Zealand	28.5	31.1	37.4	36.6	33.6	37.5	36.7	35.7
Austria	36.7	40.9	39.6	41.2	42.6	42.1	41.7	42.3
Belgium	39.5	44.4	42.0	43.6	44.9	44.8	44.5	43.9
Czech Republic				37.5	35.3	37.5	36.9	37.4
Denmark[1]	38.4	46.1	46.5	48.8	49.4	50.7	49.1	48.7
Finland	36.5	39.7	43.5	45.7	47.2	43.9	43.5	43.0
France[1]	35.4	42.8	42.0	42.9	44.4	43.9	44.2	43.5
Germany[2]	34.3	36.1	34.8	37.2	37.2	34.8	35.6	36.2
Greece	19.4	25.5	26.2	28.9	34.1	31.3	31.3	32.0
Hungary				41.3	38.0	37.2	37.1	39.5
Iceland	30.0	28.2	30.9	31.2	37.2	40.7	41.5	40.9
Ireland	28.7	34.6	33.1	32.5	31.7	30.6	31.9	30.8
Italy	25.4	33.6	37.8	40.1	42.3	40.9	42.1	43.5
Luxembourg	32.8	39.5	35.7	37.1	39.1	37.8	35.9	36.5
Netherlands[4]	40.7	42.4	42.9	41.5	39.7	38.8	39.3	37.5
Norway	39.2	42.6	41.0	40.9	42.6	43.5	43.9	43.6
Poland				36.2	31.6	32.9	33.5	34.9
Portugal	19.7	25.2	27.7	31.7	34.1	34.7	35.7	36.4
Slovak Republic					33.8	31.8	29.8	29.4
Spain[1]	18.4	27.6	32.5	32.1	34.2	35.8	36.6	37.2
Sweden	41.2	47.3	52.2	47.5	51.8	49.5	49.1	48.3
Switzerland	23.9	25.5	25.8	27.7	30.0	29.2	29.6	28.9
Turkey	11.9	11.5	14.9	16.8	24.2	24.3	24.5	23.7
United Kingdom	35.2	37.6	36.1	34.5	37.1	36.3	37.1	36.1

	1975	1985	1990	1995	200	2005	2006	2007
OECD Total	29.4	32.7	33.8	34.8	36.1	35.8	35.9	35.8
OECD America	28.8	25.0	26.8	26.7	28.0	26.9	27.3	26.5
OECD Pacific	22.6	25.8	28.5	27.9	28.8	30.3	30.5	30.4
OECD Europé	30.9	35.3	36.1	37.1	38.4	38.0	38.0	38.0
EU 19	32.2	37.6	38.2	38.9	39.4	38.7	38.7	38.8
EU 15	32.2	37.6	38.2	39.0	40.6	39.7	39.8	39.7

Note: EU 15 area countries are : Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal , Spain, Sweden and United Kingdom.
EU 19 area countries are: EU 15 countries plus Czech Republic, Hungary, Poland and Slovak Republic.

1. The total tax revenue has been reduced by the amount of the capital transfer that represents uncollected taxes.

2. Unified Germany beginning in 1991. Starting 2001, Germany has revised its treatment of non-wastable tax credits in the reporting of revenues to bring it into line with the OECD guidelines.

3. OECD estimate, including expected revenues collected by state and local governments.

4. OECD estimates for the years 2006 and 2007.

Source. OECD (2009).

As a background to the rest of the report, this introductory chapter briefly reviews the current tax system in Sweden and other OECD countries and describes some recent trends in international tax policy. The ongoing process of globalisation implies that goods and services as well as capital and people become more mobile across borders. This also increases the international mobility of tax bases and makes the performance of the small open Swedish economy more sensitive to changes in tax policy abroad. A study of recent tax policy trends may indicate how the forces of international tax competition are likely to constrain Swedish tax policy in the years to come. It may also suggest which tax instruments and tax designs have tended to work well and which have worked less well in the recent past.

1.1 The level and structure of taxation[1]

Table 1.1 shows that the overall level of taxation relative to GDP has been fairly stable in the EU and the OECD as a whole during the last decade. The rapid growth of the public sector experienced in the 1960s and 1970s thus appears to have been brought to a halt. Indeed, it is noteworthy that the ratio of tax revenue to GDP in

[1] The rest of this chapter draws heavily on the survey paper by Heady (2009).

Sweden fell by almost four percentage points between 1990 and 2007, whereas the (unweighted average) tax burden in the OECD as a whole increased by roughly two percentage points over the same period.

Table 1.2 Revenue shares of the major taxes in the OECD area

	1965	1975	1985	1995	2006
Personal income tax	26	30	30	27	25
Corporate income tax	9	8	8	8	11
Social security contributions	18	23	22	25	25
(employee)	*(6)*	*(7)*	*(7)*	*(8)*	*(9)*
(employer)	*(10)*	*(14)*	*(13)*	*(14)*	*(15)*
Payroll taxes	1	1	1	1	1
Property taxes	8	6	5	5	6
General consumption taxes	14	15	16	18	19
Specific consumption taxes	24	18	16	13	11
Other taxes	1	0	1	3	3
Total	**100**	**100**	**100**	**100**	**100**

Source: Heady (2009, Table 2), based on OECD Revenue Statistics.

Table 1.3 Tax revenue of major taxes as a percentage of total revenue, 2006

	Personal Income*	Corporate Income*	Social Security	Payroll	Property	General Consumption	Specific Consumption	Other
Australia	37.4	21.7	0.0	4.6	9.1	13.1	14.0	0.0
Austria	22.3	5.2	34.5	6.4	1.4	18.4	9.3	2.3
Belgium	29.3	8.3	30.5	0.0	5.1	16.6	9.0	0.1
Canada	36.3	11.0	14.8	2.0	10.1	14.0	10.2	1.6
Czech Republic	11.5	13.0	43.7	0.0	1.2	17.9	12.3	0.0
Denmark	49.8	8.7	2.1	0.4	3.8	20.8	12.4	1.6
Finalnd	30.3	7.7	27,9	0.0	2.5	19.9	11.3	0.1
France	17.5	6.7	37.0	2.6	8.0	16.3	8.4	3.3
Germany	24.5	5.9	38.4	0.0	2.5	17.8	10.5	0.0
Greece	14.9	8.5	35.4	0.0	4.4	22.9	13.1	0.5
Hungary	18.3	6.3	32.1	1.6	2.2	20.4	18.0	0.8
Iceland	33.7	5.8	7.9	0.1	5.3	27.2	15.1	4.9
Ireland	27.8	12.0	13.5	0.7	9.1	24.7	11.8	0.0
Italy	25.6	8.1	29.8	0.0	5.1	14.9	10.7	5.5
Japan	18.5	17.0	36.6	0.0	9.1	9.2	9.5	0.3
Korea	15.2	14.3	21.0	0.2	13.2	16.8	15.8	3.3
Luxembourg	21.0	13.8	27.7	0.0	9.3	15.6	12.3	0.1
Mexico**	25.1	--	14.9	1.3	1.6	20.2	36.1	0.8
Netherlands	18.8	8.5	36.1	0.0	4.7	18.6	12.0	0.5
New Zealand	40.7	15.8	0.0	0.0	5.2	24.4	8.3	5.7
Norway	20.7	29.4	19.8	0.0	2.7	18.2	9.1	0.0
Poland	13.7	7.1	36.3	0.8	3.7	24.2	13.9	0.0
Portugal	15.4	8.4	31.9	0.0	3.1	24.8	15.7	0.4
Slovak Republic	8.5	9.9	39.9	0.0	1.5	25.4	13.3	1.0
Spain	18.9	11.5	33.3	0.0	9.0	17.4	9.7	1.0
Sweden	31.9	7.5	25.5	5.6	3.0	18.5	7.6	0.1
Switzerland	35.6	10.1	23.3	0.0	8.0	13.2	9.8	0.0
Turkey	15.6	6.0	22.4	0.0	3.6	22.2	26.5	3.8
United Kingsdom	28.6	10.8	18.5	0.0	12.4	18.1	10.9	0.4
United States	36.5	11.8	23.8	0.0	11.1	7.8	9.0	0.0
OECD average	24.8	10.7	25.3	0.9	5.7	19.3	12.2	0.9
EU 15 avarage	25.1	8.8	28.1	1.0	5.6	19.0	11.0	1.0

* The breakdown of income tax into personal and corporate tax is not comparable across countries.
** Data for personal income tax and corporate income tax do not exist.

Source: Heady (2009, Table 3), based on OECD Revenue Statistics.

The major sources of revenue in the OECD area are listed in Table 1.2. The three biggest revenue raisers are consumption taxes, social security taxes and the personal income tax. Together these taxes account for 80 percent of total tax revenue in the average OECD country. The remaining revenue comes mainly from the corporate income tax and from property taxes. Table 1.2 shows that social security taxes have gained in relative importance over time at the expense of the personal income tax. General consumption taxes (the VAT) have also become more important, but this has been more than offset by a decline in the revenue share collected through specific consumption taxes, so the fraction of revenue coming from all consumption taxes has actually fallen.

Table 1.3 describes the tax mix in individual OECD countries. The Swedish tax structure deviates from the average tax mix in western Europe (the EU15) by placing more weight on the personal income tax. This leaves a smaller role for specific consumption taxes and for taxes on property and corporate income in Sweden, whereas the VAT generates about the same revenue share as in the other western European countries. Social security taxes appear to produce a slightly smaller revenue share in Sweden than in the EU15, but that is because the OECD categorizes the Swedish "allmän löneavgift" as a payroll tax rather than as a social security tax.

The relatively heavy weight placed on the personal income tax in the Swedish tax mix combined with the high overall level of taxation underscores the importance for Sweden of having a well-designed income tax system. With this in mind, we now take a closer look at recent income tax developments.

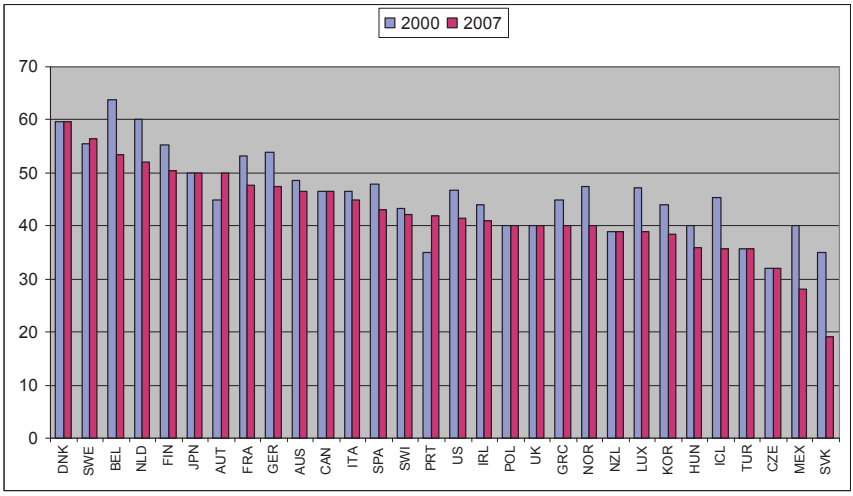
1.2 Trends in income taxation

Taxation of labour income

In recent decades tax policy makers have become increasingly aware of the negative incentive effects of high marginal tax rates. There also appears to have been a shift in political preferences away from the highly egalitarian redistributive tax policies pursued by many governments during the 1960s and 1970s. As a consequence, the top marginal personal income tax rates in many OECD countries started to fall substantially in the mid-1980s, and in most

countries – although not in Sweden - the trend towards lower top marginal rates continued during the last decade, as illustrated in Figure 1.1. According to Heady (2009, p. 11), the unweighted OECD-average of the top marginal personal income tax rate on labour income fell by 4 percentage points between 2000 and 2007. However, in many countries social security contributions have increased, so on average the overall tax wedge on wage income – measuring the difference between the total labour cost of employers and the take-home pay of employees when all taxes, social security contributions and general cash benefits have been accounted for – has only fallen slightly since 2000, as indicated in Figure 1.2.

Figure 1.1 Top statutory personal income tax rates on wage income 2000 and 2007[1]



[1.] The statutory personal income tax rate on wage income applicable at the highest income threshold for single individuals.

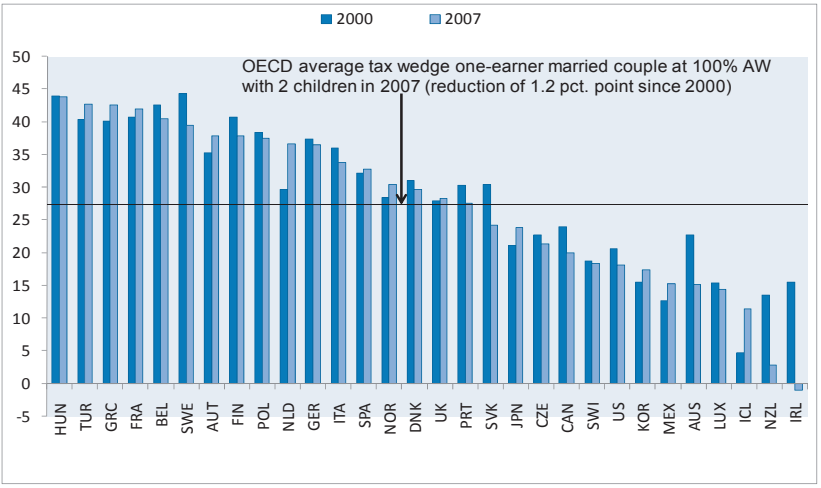
Source: Heady (2009, Figure 5), based on the OECD Tax Database.

Figure 1.2 shows that while the Swedish tax wedge for the average wage earner is still somewhat larger than in the typical OECD country, the difference has been narrowed in recent years as the Swedish tax wedge has fallen by more than three percentage points.

One notable trend in OECD tax policy has been the increasing popularity of "Making Work Pay" (MWP) policies in the form of

Earned Income Tax Credits (EITC) and similar in-work benefits, often targeted at low-income earners and/or families with children. The recent introduction of an EITC in Sweden (jobbskatte-avdraget) is an example of this international policy trend which may be seen as an attempt to compensate for the fact that globalisation and skill-biased technical change tends to reduce the employment opportunities and relative wages of low-skilled workers in western countries.

Figure 1.2 Tax wedge for one-earner family with two children at average earnings[1], 2000 and 2007



[1.] The tax wedge is the sum of income tax plus employee and employer social security contributions and payroll taxes less cash benefits as a percentage of total labor costs (gross wage plus employer social security contributions and payroll taxes).

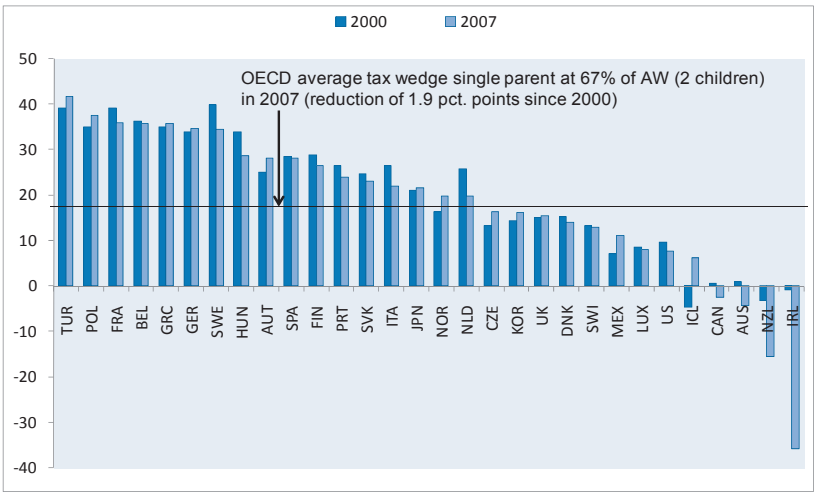
Source: Heady (2009, Figure 7), based on OECD data.

As a result of the various MWP policies, the OECD- average tax wedge for single parents at the low end of the pay scale has fallen during the last decade, as reported in Figure 1.3. MWP policies have increased the incentive for labour force participation, but since the EITCs and other in-work benefits are usually phased out as income goes up, they have also tended to increase effective marginal tax rates on labour income in the phase-out range, thus reducing the incentive to work longer hours.

Another noteworthy tax policy trend has been the move towards a flat personal income tax throughout a large part of

Eastern Europe (including Russia) during the last two decades. Under the flat tax all income above an exemption level is taxed at a constant marginal rate. In several flat tax countries this marginal rate is quite low and applies also to personal capital income and corporate income. The appeal of the flat tax is its apparent simplicity, but it has nevertheless met with considerable political resistance in western Europe which has a long tradition of imposing higher marginal tax rates on high-income earners. In such a context it is difficult to design a flat tax reform that does not involve substantial gains to high-income earners. Moreoever, the progressive personal income tax raises a greater share of revenue in western Europe than in the typical Eastern European country, so a switch to flat tax would tend to have a greater impact on income distribution in the western European setting. This may help to explain why the flat tax has not caught on in the West.

Figure 1.3 Tax wedge for single parent with two children at 67 percent of average earnings[1], 2000 and 2007



[1] The tax wedge is the sum of income tax plus employee and employer social security contributions and payroll taxes less cash benefits as a percentage of total labor costs (gross wage plus employer social security contributions).

Source: Heady (2009, Figure 8), based on OECD data.

Taxation of capital income

The discussion above focused on the taxation of labour income. Some OECD countries, mainly in the Anglo-Saxon world, still

adhere to the ideal of the comprehensive personal income tax under which progressive tax is levied on the sum of the taxpayer's income from all sources. In principle this means that capital income is taxed at the same marginal rate as labour income, although in practice many important forms of income from capital such as imputed rents on owner-occupied housing, returns to retirement savings and some types of capital gain are typically tax exempt or leniently taxed. However, in recent decades many OECD countries have abandoned the comprehensive income tax and moved towards some form of schedular taxation involving a separate taxation of labour income and (some types of) capital income.

This move was made early on and most consistently in Sweden, Norway and Finland. These countries have introduced variants of the Nordic dual income tax which combines progressive taxation of labour income with a relatively low proportional tax on capital income. A distinguishing feature of the Nordic dual income tax is that it splits income from self-employment into an imputed return to capital and a residual profit which is taxed as labour income. Other countries that abandoned the comprehensive income tax have gone less far in the direction of the dual income tax but have taken a schedular approach to the taxation of interest, dividends and capital gains. This is indicated in Table 1.4 which shows the statutory capital income tax rates in a number of EU countries plus the United States.

Separating the taxation of capital income from the taxation of labour income may be advantageous in a world of growing capital mobility where a lower tax rate on capital income may reduce the incentive for taxpayers to place their wealth in foreign assets which cannot (easily) be monitored by tax collectors. Moving towards a flat impersonal tax on (some forms of) capital income also facilitates tax administration by allowing withholding taxes at source to serve as the final tax. In Chapter 2 we will discuss the case for dual income taxation in more detail, but it is worth noting already here that since social security taxes are typically levied only on labour income but not on capital income, almost all OECD countries have de facto separated the taxation of the two types of income.

An interesting experiment in capital income taxation was undertaken by the Netherlands in 2001 when that country introduced the so-called "Box" system which taxes a deemed rather

than the actual return to many assets, effectively turning much of the capital income tax into a wealth tax. Feldt (2009) and Lodin (2009) have recently proposed a similar system as a blueprint for capital income tax reform in Sweden. Chapter 7 will consider the arguments for and against such a system of capital taxation.

Table 1.4 Statutory tax rates (%) on capital income, 2007

	Interest	Dividends	Capital gains on shares	
			Short-term gains	Long-term gains
Sweden	30	20, 25, 30[a]	30	30
Austria	25[b]	25	<1 year: 0-50	>1 year: 0
Belgium	15	25	0	0
Denmark	33-59	28-43	28-43	28-43
Estonia	22	0	22	22
Finland	28	19.6[c]	28	28
France[d]	16	0-24	16	>5 years: 10.6-0
Germany[e]	0-42	0-21	<1 year: 0-42	>1 year: 0
Ireland	20-42	20-42	20	20
Latvia	0	25	0	0
Lithuania	0 or 16[f]	15	15	15
Netherlands	30% of deemed 4% return	25% or 30% of deemed 4% return[g]	25% or 30% of deemed 4% return[g]	25% or 30% of deemed 4% return[g]
Norway	28	28[h]	28[h]	28[h]
United Kingdom	10-40	0-25[i]	10-40	>6 years: 8-20
United States[j]	17-39.5	15	17-39.5	>1 year: 15

[a.] Passive owners of closely held firms: 25%. Active owner of closely held firms: 20% up to an imputed capital income; the excess dividend is taxed as labour income.

[b.] Interest on certain accounts is tax exempt.

[c.] Special rules apply to dividends from unlisted companies.

[d.] Interest and dividends are also subject to social security tax. 40% of dividends are exempt from personal income tax; the remaining amount is taxed progressively.

[e.] Savings below a certain threshold are tax exempt.

[f.] Interest on government bonds is tax exempt.

[g.] 25% tax on actual income from substantial shareholding; 30% tax on an imputed 4% return on portfolio shareholdings as well as on interest-bearing assets.

[h.] Dividends and capital gains below an imputed risk-free rate of return are tax exempt.

[i.] Statutory tax rates on dividends are 10-40%; the effective tax rate is reduced by the imputation system.

[j.] The marginal tax rates for interest and short-term capital gains include state income tax at the rates levied in the state of New York.

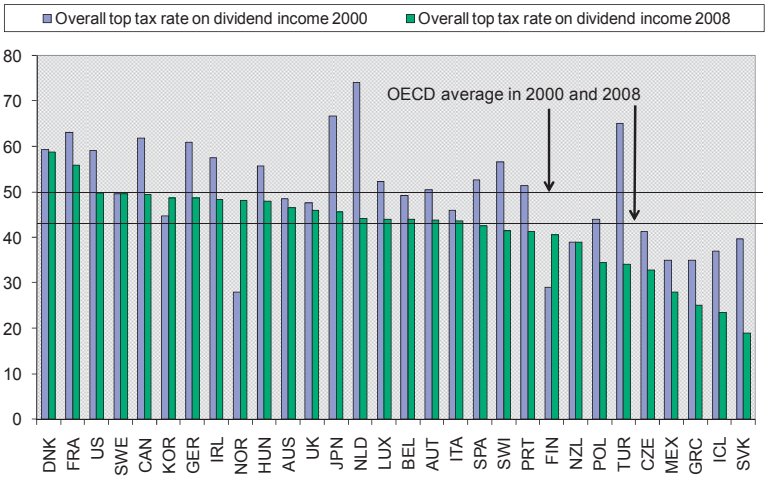
Source: Lodin (2009, Table 1) and International Bureau of Fiscal Documentation.

The personal income tax on dividends is part of the total tax burden on distributed corporate profits, the other part being the corporate income tax on the underlying company profit. Until recently it was quite common for western European countries to alleviate the double taxation of distributed profits through an imputation system under which the shareholder was granted partial or full credit against his personal dividend tax for the corporation tax already paid on the underlying profit. However, the last decade has witnessed a remarkable move away from the imputation system in several countries including Finland, France, Germany, Ireland, Italy, Norway and the UK. This development was initiated by the European Court of Justice which has taken the view that the EU treaty provisions on free capital mobility requires member states with an imputation system to grant imputation tax credits to resident shareholders on dividends received from companies in other member states even though such a credit represents corporate tax paid to another government. To abide by this ruling, member states with an imputation system would have to accept a revenue loss, and this loss could be expected to increase with the trend towards growing cross-border portfolio investment.

In reaction many EU member states have abolished the imputation system in favour of a simpler system where dividends are taxed at a concessional rate under the personal income tax, often by including only a fraction of the dividend (e.g. 50%, as in Germany) in the personal tax base. In this way many European countries have moved partly back towards a classical corporate tax system with double taxation of dividends, although the reduced personal tax rates on distributed profits imply less than full double taxation. At the same time the United States has moved from a classical corporate tax system to a system with reduced personal tax rates on dividends and capital gains, so in this way the corporate tax systems on the two sides of the Atlantic have converged.

Figure 1.4 shows the evolution of the overall top marginal tax rate on dividend income which includes the sum of the corporate and personal income tax, accounting for any measures taken to alleviate double taxation. On average the overall top marginal tax rate on dividends has fallen by 7.8 percentage points between 2000 and 2008. Most of this fall reflects the average 6.3 percentage point drop in statutory corporate income tax rates which took place over this period, as illustrated in Figure 1.5.

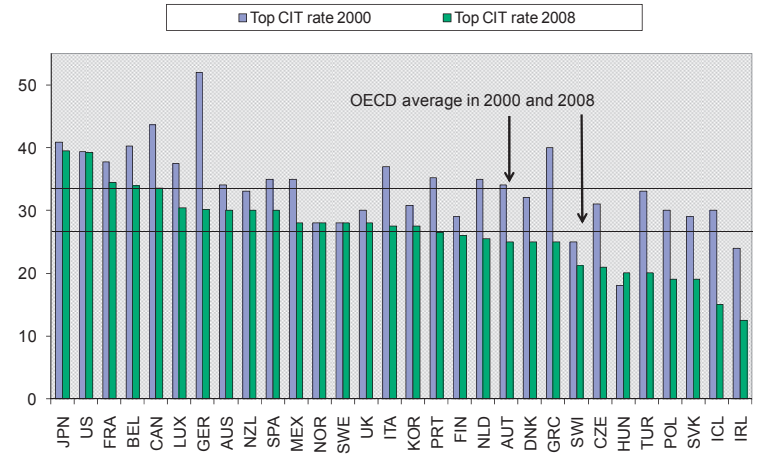
Figure 1.4 Overall statutory tax rates on dividend income,[1] 2000-2008



[1.] Overall corporate plus personal top marginal tax rate on distributions of domestic source profits to a resident individual shareholder, taking account of imputation systems, dividend tax credits, etc.

Source: Heady (2009, Figure 4), based on the OECD Tax Database.

Figure 1.5 Statutory corporate income tax rates, 2000 and 2008

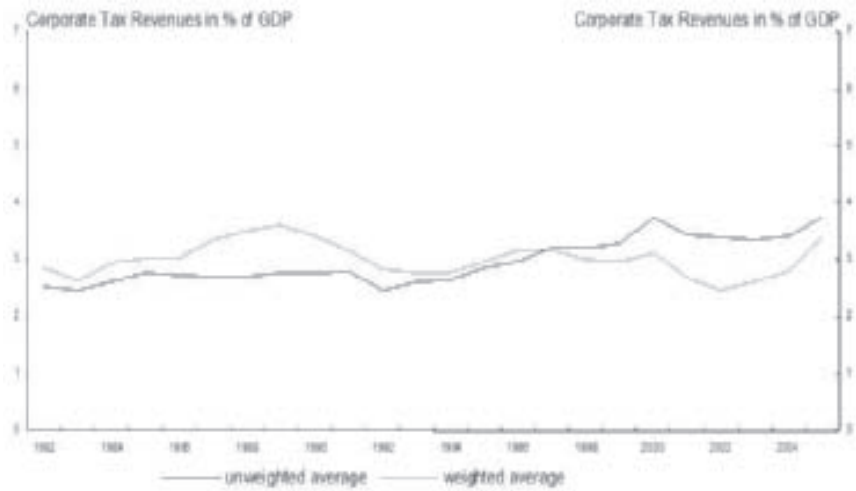


Source: Heady (2009, Figure 3), based on the OECD Tax Database.

The recent fall in statutory corporate tax rates is a continuation of an international trend that started already in the early 1980s. It is consistent with the view that growing capital mobility intensifies

international tax competition and leads to downward pressure on source-based capital taxes such as the corporation tax. However, as indicated in Figure 1.6, the ratio of corporate income tax revenue to GDP has been relatively stable, and the unweigthed OECD average of this ratio has even slightly increased over time despite falling statutory tax rates. Table 1.2 also showed that the corporate income tax has come to account for a higher share of total tax revenues, at least until the advent of the recent financial and economic crisis.

Figure 1.6 Corporate income tax revenue as a share of GDP, 1982-2005[1]



[1] The weighted average is calculated using GDP weights.
Source: Loretz (2008, Figure 3).

The seeming paradox of falling statutory corporate tax rates combined with steady or even increasing corporate tax revenues may be explained by several factors, as discussed in detail in Sørensen (2007). First, governments have to a large extent financed the statutory rate cuts by reducing depreciation allowances and eliminating a number of special deductions from the corporate tax base. Through this policy of tax-cut-cum-base-broadening national governments have tried to make their corporate tax systems less vulnerable to international profit-shifting through the manipulation of transfer prices on the intra-company transactions of multinational corporations, since a country's revenue loss from

transfer-pricing declines as its statutory corporate tax rate falls. Second, the robustness of corporate tax revenues partly reflects that the corporate income tax base has tended to increase at the expense of the personal income tax base. Thus there is evidence that the drop in corporate tax rates has induced some firms and taxpayers to shift economic activity from the non-corporate to the corporate sector (see de Mooij and Nicodème, 2008). Non-tax factors such as the declining relative importance of agriculture may also help to explain why a growing share of total business activity takes place within the corporate sector. Third, at least until recently corporate tax revenues have been boosted by the strong profitability of the financial sector which has come to account for a growing share of corporate tax payments in many countries.

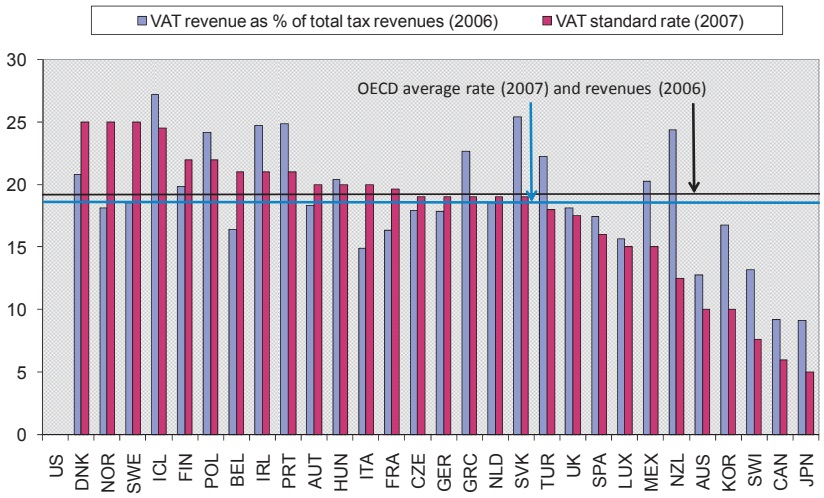
1.3 Trends in consumption taxes

Value-added taxes

As we saw in Table 1.2, the Value Added Tax has accounted for a growing share of tax revenues in OECD countries in recent decades. The United States is the only remaining OECD member state which has not adopted a VAT. In the average OECD country the VAT now accounts for almost 19 percent of total revenue. The standard VAT rate varies considerably across countries. Sweden, Norway and Denmark all apply a standard VAT rate of 25 percent, which is the highest rate in the OECD (see Figure 1.7). Most countries (including Sweden) levy reduced VAT rates on some types of consumption, typically foodstuffs and other items deemed to be necessities. Chapter 5 will argue that a differentiated VAT is an inefficient way of pursuing distributional goals, despite the popularity of this policy.

Heady (2009, section 5) documents that the growth in VAT revenues mainly reflects increases in statutory VAT rates over time, whereas OECD countries have been less successful in broadening the VAT base and moving towards a more uniform taxation of all consumption.

Figure 1.7 Standard rates of Value Added Tax and VAT share of total tax revenues



Source: Heady (2009, Figure 9), based on OECD data.

The continued popularity of the differentiated VAT may partly reflect that governments have increasingly relied on the Value Added Tax rather than traditional excise taxes, as we saw in Table 1.2. A a differentiated VAT may be an alternative to excises if the government wishes to discourage the consumption of certain items relative to others.

Green taxes

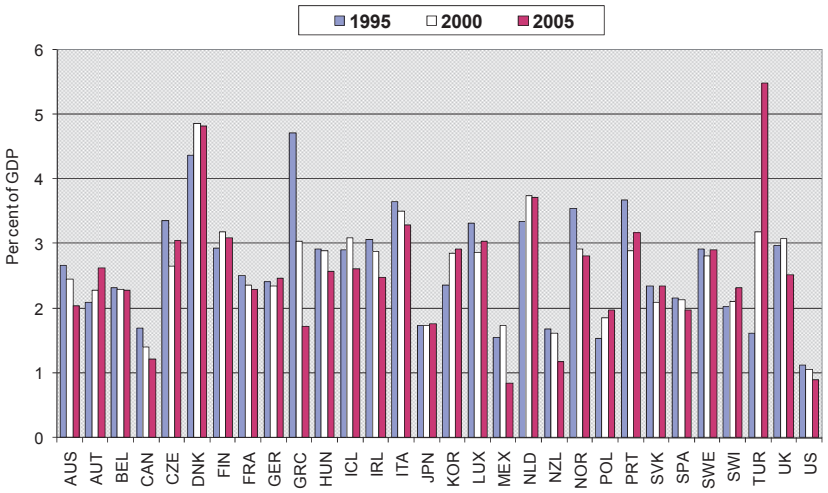
Apart from the traditional excises on alcohol and tobacco, the most important excises are environmentally related taxes. The OECD classifies a tax as being environmentally related if it is deemed to have an effect on the environment, even if this was not the original motivation for the introduction of the tax. Taxes on vehicle fuels and vehicle licenses remain by far the most important "green" taxes, despite the recent introduction of taxes on carbon dioxide emissions, waste disposal and air travel etc. in many countries.

An important theme in the international tax policy debate during the last two decades has been the potential benefits from a "green tax reform" involving a shift from conventional taxes to

taxes on polluting products and activities. A main issue has been whether such a tax shift will generate a "double dividend" in the form of a cleaner environment as well as a higher employment rate (or, more generally, a non-environmental welfare gain). The hypothesis of a double dividend from a green tax reform has had considerable popular appeal, but this has not prevented a gradual decline in the revenue from environmentally related taxes in most OECD countries, as illustrated in Figure 1.8. Of course, if the prime purpose of these taxes is to curb polluting activities, a shrinking base for green taxes may actually be welcome, but at the same time it tends to undermine the double dividend hypothesis, as Chapter 5 will explain in detail.

Figure 1.8 shows that although Sweden has a high international profile in environmental policy as well as a high overall level of taxation, the revenue from environmentally related taxes is not particularly high in Sweden. On the other hand, the revenue from green taxes in Sweden has not declined in recent years, in contrast to the trend in many other countries.

Figure 1.8 Revenues from environmentally-related taxes as a share of GDP

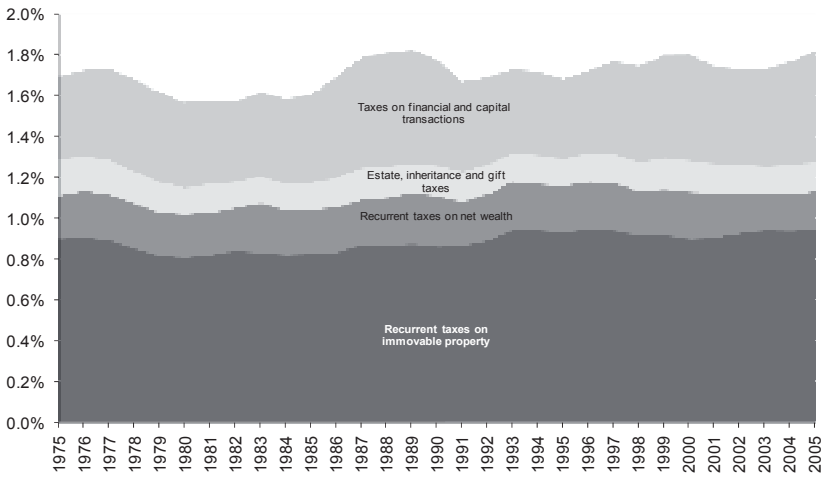


Source: Heady (2009, Figure 10), based on OECD Revenue Statistics.

1.4 Property taxes

The least important main category of taxes in the OECD is property taxes which come in a variety of forms, shown in Figure 1.9. Recurrent taxes on immovable property are taxes on land and buildings paid on an annual basis by the owner. Very often these taxes are paid to local governments for whom they may be an important revenue source, even though they only account for a minor share of total revenue. Recurrent taxes on net wealth are also paid on an annual basis by people whose net wealth (assets minus liabilities) exceed a threshold level. Taxes on financial and capital transactions are usually labeled stamp duties and are levied on the sale of land, buildings and financial assets, while estate and inheritance taxes are levied on transfer of property from someone who has died, and gift taxes are imposed to minimise avoidance of estate and inheritance tax.

Figure 1.9 Property taxes as a percentage of GDP, OECD average

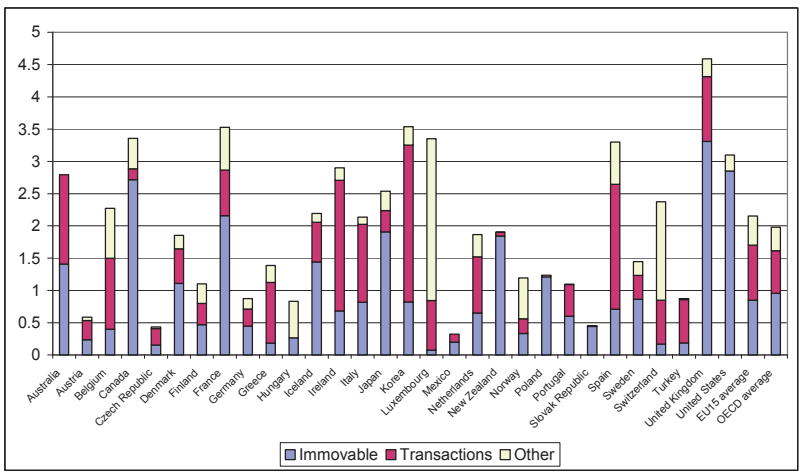


Source: Heady (2009, Figure 11), based on OECD Revenue Statistics.

Figure 1.9 shows that taxes on immovable property are the most important form of property tax, followed by stamp duties. The figure also illustrates that property tax revenues relative to GDP have been roughly constant over time in the average OECD

country. A closer inspection of the figure reveals that the revenue from recurrent taxes on net wealth has fallen slightly relative to GDP in recent years, reflecting that many countries have abolished the wealth tax. The motivations given for this policy change have typically been two-fold. First, policy makers have been concerned that the wealth tax might induce a capital flight in a world of growing capital mobility. Second, the wealth tax has typically been levied at very uneven rates on different asset types, as policy makers have been reluctant to impose high tax rates on, e.g., business assets and often also on owner-occupied dwellings. Hence the wealth tax has been considered as unfair and highly distortionary.

Figure 1.10 Property taxes as a percentage of GDP, 2006.



Source: Heady (2009, Figure 12), based on OECD Revenue Statistics.

Figure 1.10 displays a considerable diversity in the level and pattern of property taxes across OECD countries. The Anglo-Saxon countries (but also France and Japan) impose significantly higher taxes on immovable property than other OECD member states. In Sweden the share of property taxes in GDP was lower than the average shares in the OECD and the EU15 in 2006. From 2005 Sweden abolished the inheritance tax, thereby joining the small group of OECD countries that does not impose taxes on

inheritance. After 2006 Sweden has also abolished the wealth tax and lowered taxes on immovable property considerably, thus reducing the role of property taxes further. Chapter 7 will argue that the trend towards lower taxes on immovable property ought to be reversed.

1.5 Summary

Following Heady (2009), we may summarise the recent tax policy trends in OECD countries in the following way:

- The ratio of total tax revenue to GDP has been fairly stable
- There has been a trend away from personal income tax towards social security contributions
- Top marginal personal tax rates have fallen considerably but the average tax rate paid by the average worker has hardly changed
- Statutory corporate income tax rates have also fallen substantially, but the ratio of corporate tax revenue to GDP has been relatively stable as the corporate tax base has expanded
- There has been a move away from the imputation system of dividend tax relief in Western Europe towards simpler systems involving reduced personal tax rates on dividends
- The share of revenue coming from VAT has risen, but the revenue share of excises has fallen even more, so the share of total revenue stemming from consumption taxes has fallen
- The revenue from environmental taxes has slightly declined relative to GDP
- The total revenue from property taxes has been rather stable relative to GDP, although several countries have abolished their taxes on net wealth

Whereas the total tax-to-GDP ratio has been roughly constant in the OECD area as a whole, Sweden has reduced the total tax burden by several percentage points, in part by lowering the tax burden on labour. As a consequence, Sweden has been overtaken by Denmark as the country with the highest ratio of taxes to GDP. Nevertheless, Sweden still taxes labour income more heavily than most other OECD countries. Like Denmark, Sweden stands out

by relying more heavily on the personal income tax than the average OECD country. Social security taxes and the VAT generate about the same share of total revenue in Sweden as in the average Western European EU country, whereas specific consumption taxes, property taxes and the corporate income tax all contribute a smaller fraction of total revenue in Sweden than in the EU15 area.

Of course one cannot necessarily conclude from this descriptive overview that Sweden should change her tax structure in the direction of the EU or the OECD average. Since countries differ in terms of economic structure, administrative capacity and public policy goals, there are good reasons to believe that the optimal level and structure of taxation also differs across countries. Nevertheless, if there are significant differences between the domestic and foreign tax systems, it may be relevant to ask whether there are indeed good reasons for this divergence, or whether it could motivate a reconsideration of domestic tax policies. In our discussion of future directions for Swedish tax policy we will therefore keep the above comparative analysis in mind.

2 The tax reform of the century

In 1991 Sweden implemented what has come to be known as "The Tax Reform of the Century". The reform was indeed very ambitious, involving a combination of tax rate cuts and tax base broadening amounting to about 6 percent of GDP. In comparison, the much heralded U.S. tax reform of 1986, which attracted a lot of international attention at the time, "only" implied a tax shift of around 1-2 percent of GDP.

The Swedish tax reform of 1991 was also remarkable in other respects. It was the culmination of a long process of investigation in which alternative blueprints for tax reform had been carefully studied by various government committees involving academic tax experts, civil servants, politicians and representatives of the most important interest groups. This preparatory work included thorough studies of the possibilities for implementing a personal expenditure tax (see SOU 1986:40), a cash flow tax for businesses (SOU 1989:34, vol. I, bilaga D), and a switch from nominal to real income taxation through systematic inflation adjustment of nominal capital income (SOU 1989:36). During this long process of detailed analysis, the key players in the Swedish tax policy debate had reached a high degree of consensus concerning the main weaknesses of the existing tax system and the most promising directions for tax reform. Hence the Tax Reform of the Century was guided by a clear set of principles which ensured a high degree of consistency in the implementation of the reform. The consequences were almost revolutionary. For example, the statutory corporate income tax rate was almost cut in half, but the resulting revenue loss was fully offset by a broadening of the corporate tax base. Moreover, the tax reform involved all the major parts of the tax system, including the personal and corporate income tax, social security taxes, the VAT, and property taxes.

This chapter briefly explains the background for and the main elements of the 1991 tax reform as well as the underlying philosophy.

2.1 The 1991 tax reform: background and principles

Problems with the old tax system

The Swedish tax system of the 1980s was characterized by numerous deductions and exemptions from the tax base and several special tax regimes for particular types of income. The combination of narrow tax bases with the need to raise revenues of more than half of GDP required very high marginal tax rates, resulting in serious distortions of taxpayer incentives. Thus, in the early 1980s the top marginal personal tax rate was 85 percent, and in 1989 it was still as high as 73 percent. In addition to this high personal tax, labour income was subject to social security tax.

The high marginal tax rates tended to discourage labour supply and created strong incentives to remunerate labour in the form of fringe benefits rather than cash wages, since many benefits in kind were subject to generous valuation rules or were not taxed at all.

In the area of capital income taxation distortions were also very serious, due to the highly uneven taxation of different types of income. As far as ordinary savings in interest-bearing assets were concerned, the personal income tax was levied on the full nominal return, including the inflation component of the interest payment which only served to maintain the real value of the nominal asset. Given the high marginal tax rates, the taxation of the full nominal return typically left taxpayers with a negative real after-tax return to their savings. At the same time taxpayers could deduct all of their nominal interest expenses. An earlier tax reform taking effect from 1983[2] had imposed the limitation that negative net capital income could at most be deducted against a marginal tax rate of 50 percent, a cap that had fallen to 47 percent by 1989. Even so, at the inflation rates prevailing in the late 1980s net debtors usually ended up paying negative after-tax real interest rates. This made it very attractive to borrow and invest the borrowed funds in tax-favoured assets, e.g., assets whose returns came mainly in the form of

[2] The reform was agreed upon during the night between April 23 and 24, 1981 which became known as "the wonderful night" ("den underbara natten").

lightly-taxed capital gains. Further, as children and spouses were taxed separately, family members could shift assets and liabilities among themselves to take advantage of the often huge differences in their marginal tax rates.

The corporate tax system of the 1980s was also marred by distortions. The statutory corporate tax rate before the tax reform was around 57 percent, including a special profit sharing tax, but due to numerous deductions and special provisions, the estimated average effective tax rate on economic profits was only about 19 percent (Lodin, 2009, p. 101). However, this average masked a considerable difference in effective tax burdens across companies. The generous deductions from the tax base in the form of depreciation allowances, inventory allowances and allocations to investment funds tended to benefit capital intensive manufacturing firms at the expense of labour intensive service sector firms. As an example of the skewed incentives implied by the very generous capital allowances etc., Lodin (op.cit., p. 101-102) mentions that Swedish companies came to own a major part of the international fleet of air planes operated on a leasing basis. According to Lodin a great many of these air planes were left idle on the ground in the Nevada desert during the U.S. recession in 1990-1991! More generally, the tax code often made it profitable to invest in real assets with a very low or even a negative social (i.e., pre-tax) rate of return, and the tax system strongly favoured debt finance at the expense of equity finance.

In the field of indirect taxation, the main problem was a rather narrow base for the VAT which exempted most services and energy consumption and applied reduced rates to some items such as building construction and repair. With the high pre-reform VAT rate of 23.46%, this lack of uniformity tended to distort the pattern of consumption.[3]

Reform options considered and rejected

The design for the tax reform of 1991 was chosen after a consideration of some radical alternatives. After having carefully studied the possibility of implementing a progressive personal

[3] As Chapter 5 will explain, a uniform VAT on all goods and services is not necessarily optimal from a theoretical point of view, but the VAT differentiation practised before the 1991 tax reform was hard to defend by the principles of optimal tax theory.

expenditure tax based on the cash flow principle, a government committee concluded in 1986 that it could not recommend the introduction of such a tax (SOU 1986:40). The reasons were a number of transition problems raised by the move to an expenditure tax; the problems of coordinating a Swedish expenditure tax with the conventional income tax systems in other countries, and the scope for tax avoidance through the shifting of assets and liabilities between spouses under a progressive individualized expenditure tax. However, the committee also noted that a personal consumption tax had many virtues relative to the income tax by securing a neutral treatment of all forms of saving and investment. As argued by Lodin (2009, p. 94), the extensive committee work on expenditure taxation therefore played a useful role by helping to clarify the weaknesses of the existing income tax, and by defining certain standards of tax neutrality against which future tax reform proposals could be judged.

As part of the preparations for the tax reform of 1991, a government committee considered another ambitious blueprint for reform in the form of a "real" income tax involving a systematic inflation adjustment of all nominal returns to capital (SOU 1989:36). Compared to previous proposals for an inflation-adjusted income tax, the innovation introduced by this committee was a so-called balance sheet method which eliminated the need to undertake a cumbersome inflation-adjustment of the nominal return to each of the taxpayer's individual assets. Under the balance sheet method each business firm would be granted a deduction equal to the inflation rate times the net equity recorded in the firm's tax accounts. In this way a purely nominal appreciation of net assets due to inflation would be tax-free, so in principle the business income tax would only be levied on real profits. In a similar way, personal taxpayers would get a deduction equal to the inflation rate times their net nominal assets, defined as the difference between their interest-bearing assets and liabilities (for net debtors this meant that the inflation component of their net interest expenses would be added to their taxable income so that only the real interest expenses would be deductible). Further, when calculating a personal taxpayer's taxable capital gain on assets like shares and real estate etc., the basis value of the asset would be fully adjusted for inflation, so only the real gain would be taxed. Although elegant, this blueprint for real income taxation was not adopted by policy makers. The main concern was that, like the

expenditure tax and the cash flow business tax, an inflation-adjusted Swedish income tax for firms and households would be difficult to coordinate with the conventional nominalistic income tax systems in other countries. In addition, there was some concern that systematic inflation-adjustment of the income tax could weaken the government's commitment to fight inflation.

A third alternative for capital income tax reform that came up for discussion was the so-called fractional method (kvotmetoden) proposed by Sven-Olof Lodin (Lodin, 2009, pp. 135-37). According to this method only a certain fraction of the taxpayer's net nominal capital income (including nominal capital gains) would be included in taxable income. This fraction of capital income would then be added to the taxpayer's incomes from other sources, and the resulting total income would be subject to a common progressive tax rate schedule. The fixed fraction of capital income to be included in taxable income should roughly correspond to the ratio of the average real interest rate to the average nominal interest rate under "normal" levels of inflation. Lodin acknowledged that this system would only provide a rough and inaccurate adjustment for inflation, but he argued that the simplicity of the system would make up for this shortcoming. Yet policy makers did not adopt his proposal. Apparently the reason was that, since the fractional method involved progressive taxation of real capital income, it would imply a smaller tax benefit from interest deductibility for homeowners with low incomes (and hence low marginal tax rates) than for homeowners with high incomes and high marginal tax rates. After having defended the tax reform of 1983 with the argument that it would be unfair if the rich could benefit more from interest deductibility than the poor, politicians did not want to return to a system that would seem to have such an effect.

The blueprint finally adopted: the dual income tax

In the end policy makers therefore came out in favour of a blueprint that has now become known as the Nordic dual income tax which separates the taxation of capital income from the taxation of other income. Specifically, the dual income tax combines progressive taxation of labour and transfer income with a relatively low proportional tax on capital income. In the pure version of the system the capital income tax rate is aligned with the

corporate income tax rate and with the marginal tax rate in the first bracket of the labour income tax schedule. One may therefore say that the dual income tax combines a proportional tax on all income with a progressive surtax on high labour incomes.

In a tax reform taking effect from 1987, Denmark had already introduced a version of the dual income tax that separated the taxation of capital income from the taxation of other incomes. However, although the Danish minority government had originally proposed a fairly clean dual income tax, the final outcome of the political negotiations was that some progressivity in the taxation of positive net capital income was maintained. Moreover, although lower than the top marginal tax rate on labour income, the standard capital income tax rate remained at a rather high level.

In contrast, the Swedish tax reform of 1991 was a far more consistent version of the dual income tax and went much further in broadening the tax base and cutting marginal tax rates. A low flat tax rate on capital income was adopted as a simple way of accounting for inflation in a rough and ready manner, given that a more precise and systematic inflation-adjustment of nominal capital income would not be attempted for the reasons mentioned above. The flat capital income tax rate was set at 30 percent, in line with the corporate income tax rate, whereas the top marginal personal tax rate on labour income ended up at 51 percent. To defend the lower tax rate on capital income, it was stressed that since the 30 percent capital income tax was levied on the full nominal return, it still implied a rather high marginal tax rate on the real rate of return. For example, assuming a 4 percent real interest rate and a 4 percent annual rate of inflation (not uncommon at the time), the effective capital income tax on the real return would be 0.3*8/4=0.6, that is, 60 percent.

Another motivation for lowering the statutory capital income tax rate was that it is easier to broaden the capital income tax base when the tax rate is not too high, since some forms of capital income are notoriously difficult to tax, for practical or political reasons. Economically and politically there was a clear link between the broadening of the capital income tax base and the cut in the statutory tax rate.

Moreover, since the revenue from the personal capital income tax was negative prior to the reform, because of the liberal rules for interest deductions combined with lenient taxation of many forms of capital income, the cut in the capital income tax rate generated

additional revenue by reducing the tax benefit from interest deductibility. In this way the lowering of the capital income tax helped to finance the cuts in the labour income tax.

A further argument was that a relatively low capital income tax rate helps to prevent capital flight, as mentioned in Chapter 1. This argument played a role in the debate among tax experts, although it was not flagged by policy makers at the time of the tax reform.

In addition to these arguments in favour of a *low* tax rate on capital income, tax experts also pointed to the following advantages of a *flat* rather than a progressive tax on capital income (see Sørensen (1994)):

- Lock-in effects: Capital gains taxation based on the realization principle generates a lock-in effect which hampers the reallocation of capital towards more productive uses. Progressive taxation of realized gains exacerbates this lock-in effect because the taxpayer may be pushed into a higher tax bracket in the year of realization. A low flat tax on capital income avoids this additional distortion.
- Tax arbitrage: Aligning the corporate with the personal tax rate on capital income, and equalizing marginal capital income tax rates across taxpayers, eliminates the scope for tax arbitrage activities that seek to exploit such differences in tax rates.
- Clientele effects: Under a progressive capital income tax investors in high-income brackets may choose to specialize in holding assets whose returns accrue in tax-favoured form (e.g. in the form of capital gains benefiting from tax deferral). Since the productivity of assets may depend on who owns them, such tax distortions to ownership patterns may be undesirable. A switch to proportional capital income taxation will reduce such distortions.
- Tax administration: A flat tax rate on capital income simplifies tax administration by allowing the tax on interest and dividends to be collected as a final withholding tax.

Besides these rather pragmatic arguments, the academic study by Nielsen and Sørensen (1997) has shown that combining a flat tax on capital income with progressive taxation of labour income may be desirable on theoretical grounds because it serves to equalize the tax treatment of non-human and human capital investment (see Box 2.1).

Other guiding principles: neutrality and uniformity

The Tax Reform of the Century was remarkable for the zeal with which it pursued the goals of tax neutrality and uniformity. As we shall discuss in Chapter 5, the modern theory of optimal taxation.

Box 2.1 The dual income tax and the theory of optimal taxation

The dual income tax combines a flat tax on capital income with progressive taxation of labour income. As shown by Nielsen and Sørensen (1997), if the government is committed to tax capital income, the "optimal" income tax system does in fact take the form of a dual income tax, because this tax system can be designed to eliminate tax distortions to the choice between human and non-human capital investment.

If the labour income tax were purely proportional, it would tend to exempt the return to human capital investment from tax. To illustrate, suppose a taxpayer with a potential income of 100,000 in period 1 decides to enroll in an education program which raises his potential income in period 2 to 210,000. By sacrificing an income of 100,000 in the first period, he can thus raise his income in period 2 by 110,000, implying a 10 percent pre-tax rate of return to his human capital investment. If labour income is taxed at a flat rate of 50 percent, the net income foregone in year 1 is 50,000, while the increase in after-tax income obtainable in year 2 is 55,000 (=0.5x110,000), so measured in after-tax terms the return to human capital investment is still equal to the 10 percent pre-tax rate of return.

By contrast, the income tax does reduce the net return obtainable on physical and financial investments. Thus a purely proportional income tax will tend to favour human over non-human capital investments. But under a dual income tax where the proportional capital income tax is combined with a progressive labour income tax, with higher levels of income being subject to higher marginal tax rates, the return to human capital investment is likewise curbed by the tax system. With

Box 2.1 cont.
an appropriate degree of progressivity of the labour income tax, policy makers can in principle ensure that the tax system will not distort the choice between investment in human versus non-human capital.

does not necessarily support the notion that taxation should be "neutral" and uniform in a second-best setting where certain tax distortions are unavoidable.[4] However, the non-neutralities and non-uniformities characterizing the Swedish tax system of the 1980s were almost certainly not optimal by the standards of optimal tax theory, and there was a strong belief among tax experts and policy makers that a simpler and much less distortionary tax system could be achieved by sticking to the time-honoured goal of neutrality. This principle paved the way for a dramatic broadening of tax bases, especially in the area of capital income taxation and business income taxation, as many types of income that had previously been tax-free or tax-favoured became subject to tax at standard rates. In a similar way, the Value Added Tax became much more broadly based.

This drive towards neutrality and uniformity of taxation was not only seen as a way of improving economic efficiency; it was also perceived as a way of ensuring a more equitable tax system. Subjecting all forms of income and consumption to tax at the standard rates strengthened horizontal equity, that is, the principle that taxpayers with the same ability to pay should pay the same amount of tax. It was also argued that the base-broadening measures of the tax reform promoted the goal of vertical equity, i.e., the principle that taxpayers with a greater ability to pay should foot a larger tax bill. The argument was that, in practice, the many deductions and special provisions in the old tax system tended to

[4] The theory of optimal commodity taxation pioneered by Ramsey (1927) prescribes that, under certain simplifying assumptions explained in Chapter 5, indirect tax rates should vary inversely with the price elasticity of demand for the different consumer goods and services. Another fundamental part of optimal tax theory is the so-called Production Efficiency Theorem of Diamond and Mirrlees (1971) which says that the optimal tax system will avoid differential taxation of inputs into production (again under a number of simplifying assumptions). This theorem provides theoretical support for the principle of "neutrality" in capital income taxation. See Sørensen (2007b) and Chapter 5 of this report for further discussion of the relation between optimal tax theory and the principles of uniformity and neutrality of taxation.

benefit the rich and sophisticated taxpayers who had better opportunities for tax planning.

The 1991 reform in quantitative terms

Table 2.1 gives an impression of the magnitude and composition of the reshuffling of tax collections implied by the Swedish tax reform of 1991, based on estimates made in the spring of 1991.[5] The table underscores the point made earlier that the broadening of the capital income tax base was a major element (indeed the most important one) in the financing of the cuts in personal tax rates. The other major elements were the broadening of the bases for the VAT and the labour income tax. The special distributional measures recorded in Table 2.1 (increases in child benefits, housing benefits and education benefits) were undertaken mainly to compensate for the VAT increase. The corporate tax reform was roughly revenue-neutral.

Table 2.1 The Swedish tax reform of 1991 in budgetary terms (percent of GDP, pre-reform estimates)[1]

Revenue losses	
Cut in personal income tax rates	5.9
Cut in corporate income tax rate	0.8
Special distributional measures[2]	0.6
Total revenue loss from tax cuts etc.	*7.3*
Financing	
Broader base of labour income tax	0.9
Broader base of personal capital income tax + higher property tax	2.6
Broader VAT base+ move to uniform VAT rate	1.9
Other revenues	0.6
Dynamic effects[3]	0.3
Total financing	*7.1*

1. Rounded numbers.

2. Increases in child benefits, housing benefits and education benefits.

3. Estimated revenue gain from tax base expansions due to behavioural responses.

Source: Ministry of Finance (1991) and author's calculations based on SOU 1989:34.

[5] In the short term, the actual revenues collected after the tax reform turned out to be lower than indicated in Table 2.1, mainly because the serious recession of 1992-93 eroded all tax bases.

Table 2.2 shows ex post data on the composition of tax revenues before and after the 1991 tax reform. Since parts of the reform were implemented already in 1990, the table compares the tax structure in 1991 to that prevailing in 1989. We see that the 1991 reform significantly reduced the share of tax revenue collected through the personal and corporate income tax, whereas all other sources of revenue (in particular consumption taxes and social security taxes) became relatively more important.

Table 2.2 Sources of tax revenue in Sweden before and after the tax reform of 1991 (percent of total receipts)

	1989	1991
Taxes on personal income	39.3	33.5
Taxes on corporate income	3.8	3.5
Social security contributions	26.7	29.1
Payroll taxes	2.5	3.5
Property taxes	3.3	4.0
Taxes on goods and services	24.2	26.4
VAT	13.6	16.4
Excise taxes	10.6	10.0
Miscellaneous taxes	0.2	0.1
Share of taxes in GDP (percent)	55.5	53.7

Source: Revenue Statistics of OECD Member Countries (Source OECD).

We shall now consider the specific elements of the 1991 tax reform in more detail.

2.2 The taxation of labour income before and after the 1991 reform

The broadening of the labour income tax base

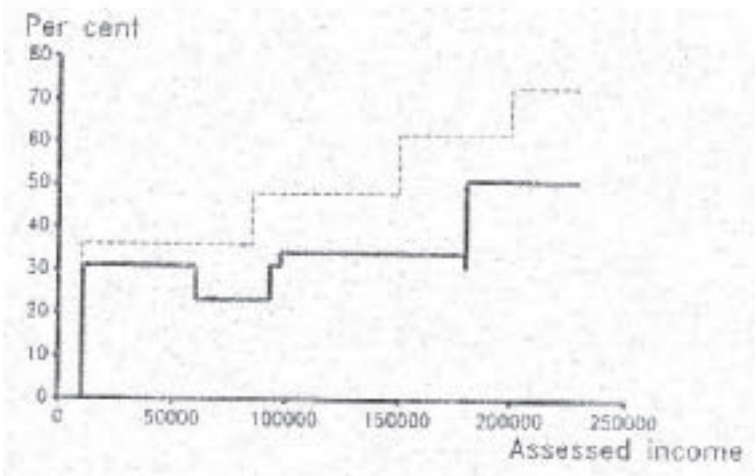
Prior to the reform many types of fringe benefits and income in kind were assessed at an unrealistically low value for tax purposes or were not taxed at all. The 1991 reform made a serious attempt to subject all forms of remuneration for work to social security tax as well as personal income tax, thereby broadening the labour income tax base by almost one percent of GDP (see Table 2.1). The tightening of the tax rules concerned employer-financed benefits in kind such as travels, company cars, meals, subsidised loans and

certain insurance schemes. There was also a tightening of the rules regarding cost allowances and itemized deductions for work-related expenses. Further, income which did not entitle the beneficiary to social security benefits became subject to a so-called special salary tax corresponding to the fraction of social security contributions that was deemed to constitute a "genuine" tax (in the sense of not entitling the taxpayer to any benefits).

The change in the tax schedule

The personal income tax schedule before and after the tax reform is illustrated in Figure 2.1. Before the tax reform assessed income above the exemption level was taxed according to a progressive schedule with four brackets (back in 1982, the number of brackets was as large as 14!). After the 1991 reform the personal income tax to the central government was abolished for almost 85 percent of all taxpayers, implying that taxpayers with assessed labour incomes above the exemption level of 10,300 SEK only paid a flat local government income tax of 31 percent in an average municipality. In addition, the 15 percent top income earners were liable to a 20 percent central government surtax on that part of their income which exceeded 180,300 SEK.

Figure 2.1 Marginal personal income tax rates before and after the 1991 tax reform



Dotted line: Marginal tax rates in 1989. Thick line: Marginal tax rates in 1991.
Source: Ministry of Finance (1991, Figure 1).

Formally, the new tax schedule thus had only two brackets above the exemption level. However, to provide additional tax relief for low and middle income earners, the standard deduction was increased by 25 percent of any additional income earned in the interval between roughly 60,000 and 93,000 SEK. For incomes in the interval between 93,000 and 98,000 SEK the standard deduction was kept constant at its maximum level, and for incomes above 98,000 it was gradually reduced by 10 percent of any additional income earned until it reached its minimum level at an income of around 180,000 SEK. This dependence of the standard deduction on the income level explains the irregularity of the solid line in Figure 2.1 which illustrates the effective marginal personal tax rate on labour income in 1991.

It must be kept in mind that the Swedish personal income tax is levied on the taxpayer's income after deduction for the employer's social security contributions. The total social security tax rate in 1991 amounted to about 28 percent of the employer's gross labour cost (about 39 percent of the wage paid out to the employee), so the overall top marginal income tax rate amounted to 28+(1-0.28)*51 = 64.7 percent after the tax reform when social security contributions are accounted for. To estimate the total marginal tax wedge on labour income, one must also include the indirect taxes on consumption which erode the purchasing power of nominal wage income. Figure 2.2 shows estimates of the evolution of the marginal net-of-tax wage, defined as one minus the total marginal effective tax rate on labour income, including social security tax, personal income tax plus VAT and excises.

We see that the tax reform implied a significant increase in the marginal take-home pay of blue-collar as well as white-collar workers. In relative terms, the increase from 1989 to 1991 was 23 percent for blue-collar workers and an impressive 76 percent for white-collar workers. The larger relative gain for the latter group mainly reflected that these taxpayers were only allowed to take home about 15 öre of each additional krona earned prior to the reform.

It should be noted that while the majority of wage earners experienced a cut in their marginal tax rate as a result of the 1991 reform, about a quarter of them actually faced an increase in their marginal effective tax rates (Agell, Englund and Södersten, 1996, p. 653). These taxpayers were mainly part-time workers entitled to income-dependent housing benefits and child benefits. As a

distributional measure, these benefits were increased as part of the reform, and consequently the phase-out of the larger benefits with rising income levels tended to increase the effective marginal tax rates for many part-time workers.

Figure 2.2 The marginal take-home pay per krona of employer costs, 1952-93

Högre tjänsteman = high-income white-collar worker. Industriarbetare = average blue-collar worker.
Source: Figure 5.2 in Agell, Englund and Södersten (1995), based on Du Rietz (1994).

2.3 The reform of the personal capital income tax

The most innovative feature of the 1991 tax reform was the switch to a dual income tax with a flat uniform 30 percent tax rate on all personal capital income without any exemption level. The capital income tax base under the new dual income tax included interest, dividends, capital gains and rental income. The reform abolished the long-time practice of including an imputed rent on owner-occupied housing in the owner's taxable income, but at the same time the property tax on owner-occupied housing was raised from 0.47 to 1.5 percent of the ratable value, intended to correspond to 75 percent of the fair market value. Under a fully proportional capital income tax one can of course impose the same effective tax rate on home-ownership via a proportional property tax and via a personal capital income tax on an imputed rent which is calculated as a certain percentage of the property value.

Before the tax reform taxpayers could deduct their interest expenses against a marginal tax rate of up to 47 percent. After the 1991 tax reform a taxpayer with negative net capital income became entitled to a tax credit amounting to 30 percent of the negative net capital income, to be deducted against the tax liability on other income. However, if net interest expenses exceeded 100,000 SEK, only 70 percent of the excess amount would give rise to a tax credit.

The reform implied a substantial tightening of capital gains tax rules. For example, before the reform only 40 percent of a capital gain on a share would be taxable if the share had been held for more than two years. After the reform essentially all realized nominal capital gains became fully taxable regardless of the length of the holding period. Capital losses on listed shares were fully deductible against capital gains on such shares, but otherwise only 70 percent of a realized loss on a share was made deductible from the capital income tax base. This limitation was intended to offset the benefit from the deferral of tax on gains until the time of realization. Gains and losses on debt instruments became subject to similar rules. In principle, all realized nominal capital gains on the sale of real estate, including owner-occupied dwellings, were likewise subjected to capital income tax. However, to reduce lock-in effects in the housing market, the capital gains tax was limited to 9 percent of the sales price for permanent residences and 18 percent for other private real estate.

In Sweden as elsewhere, savings for retirement via pension funds and life insurance companies constitute a significant share of total private savings. While most countries exempt the return to retirement savings from tax, the Swedish 1991 reform introduced a 10 percent tax rate on the return to savings channelled through life insurance companies as part of a collective bargaining agreement, and a 15 percent tax rate on the return to private individual retirement savings.

Table 2.3 shows that the reform of capital income taxation led to a much higher degree of uniformity in the taxation of different asset types. The table presents estimates of the real pre-tax rate of return required on the different assets in order to obtain a two percent real after-tax rate of return, assuming a capital income tax rate of 60 percent before the reform and 30 percent after the reform, and accounting for the changes in personal as well corporate tax rules. It is noteworthy from the table that although

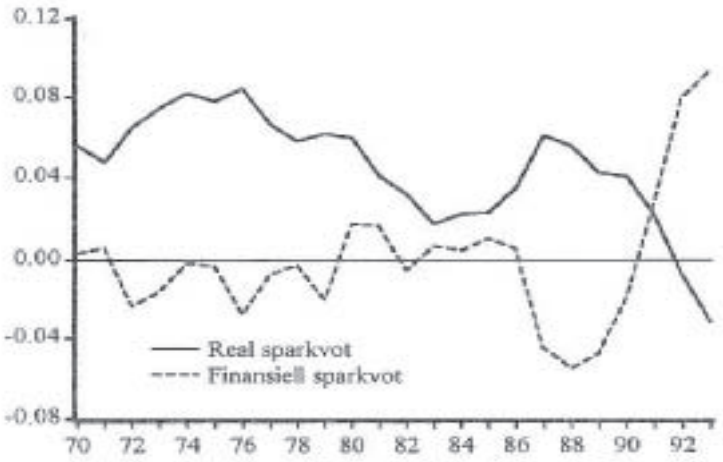
the new dual income tax after 1991 imposed capital income tax on the full nominal returns, the level and dispersion of the required returns on different forms of saving nevertheless became less sensitive to inflation after the reform, due to the much lower statutory marginal tax rate.

Table 2.3 Required real pre-tax rate of return (percent) to obtain a two percent after-tax real rate of return

Savings vehicle	*Before 1991 tax reform*		*After 1991 tax reform*	
	0% inflation	5% inflation	0% inflation	5% inflation
Shares in own company	4.1	9.8	2.9	4.8
Owner-occupied dwelling	3.7	3.7	2.9	3.4
Bank account	5.0	12.5	2.9	5.0
Durable consumer good	2.0	2.0	2.0	2.0

Source: Agell, Englund and Södersten (1995, Table 3.2).

Figure 2.3 Real and financial savings rate of Swedish households, 1970-1993 (percent)



Real sparkvot = savings in real estate and consumer durables in percent of household disposable income
Finansiell sparkvot = savings in net financial assets in percent of household disposable income
Source: Agell, Englund and Södersten (1995, Figure 3.5).

Table 2.3 also reveals that the reform significantly reduced the tax benefits to savings in real assets such as villas and consumer durables. After the tax reform one would thus expect to see a household portfolio shift away from such assets towards financial assets. Figure 2.3 shows that this is exactly what happened, although part of this shift was caused by the sharp recession in the Swedish economy after 1991 (to which we shall return later).

2.4 The reform of the taxation of business income

The corporate tax reform

The new 1991 rules for the corporate income tax marked a decisive break with the long-standing Swedish policy of stimulating business investment in fixed capital through a combination of a high statutory tax rate and generous capital allowances. Whereas this policy was previously believed the to be growth-promoting, the debate of the late 1980s rather stressed that the high rates of profit retention required to take advantage of the various allowances slowed down the necessary structural adjustment and reallocation of capital across firms and industries and tended to favour capital-intensive manufacturing firms at the expense of the service sector.

The 1991 tax reform reduced the statutory corporate tax rate from 52 to 30 percent, in line with the new personal capital income tax rate. Since the reform also eliminated the so-called profit sharing tax (see Södersten, 1993), the statutory tax rate was in fact almost cut in half.

To maintain an unchanged revenue from the corporation tax, the previous allowance to write down inventories by up to 50 percent of the FIFO value was abolished, as was the time-honoured Swedish Investment Fund system which allowed firms to set aside tax-free reserves that could later be used to fund investment. The corporate tax base was further broadened by the full inclusion of realized nominal capital gains on financial investments and real estate and by elimination of the so-called primary deductions for building investment.

However, the special Swedish Annell scheme of mitigating the double taxation of dividends at the corporate level was maintained. Under this regime Swedish corporations were allowed to deduct

dividends on newly issued shares from taxable corporate income. The annual deduction could not exceed 10 percent of the revenue from the share issue, and the total accumulated dividend deduction could not exceed the total revenue from the issue. Moreover, a dividend deduction could be taken no longer than 20 years after the time of the share issue.

Further, the 1991 tax reform introduced a new reserve option referred to as the SURV (SkatteUtjämningsReserV). Under the SURV system companies were allowed to deduct up to 30 percent of the net increase in the book value of equity, including the increase in equity stemming from retained (taxable) profits. This deduction – which took the form of a tax-free allocation to a so-called tax equalization fund – was economically equivalent to a partial (30 percent) deduction for the nominal cost of equity. The SURV system was partly intended as a substitute for loss carry-backward, since accumulated SURV allocations could be used as an offset against tax losses.

Table 2.4 The real cost of corporate capital (percent) before and after the 1991 tax reform

	Before 1991 tax reform		*After 1991 tax reform*	
	Inflation rate		Inflation rate	
	0%	4%	0%	4%
Type of asset				
Inventories	4.5	4.9	4.7	5.5
Machinery	4.1	4.0	3.9	3.8
Buildings	4.9	4.7	4.5	4.4
Source of finance				
Debt	3.2	3.1	3.7	3.1
New equity	3.8	3.9	3.6	3.8
Retained earnings	5.4	6.0	4.8	5.4
Average	4.5	4.5	4.4	4.5

Note: The calculations assume that the investment must yield a real rate of return of 4% after corporation tax.
Source: Agell, Englund and Södersten (1995, Table 4.1 and 4.2)

Table 2.5 presents estimates of the cost of corporate capital, that is, the required real pre-tax return on corporate investment before and after the 1991 tax reform. The estimates were produced by means of the so-called King-Fullerton method which will also be used in Chapters 4 and 7 of this report. They assume that the investment

must yield a rate of return corresponding to an internationally determined real interest rate of 4 percent after corporation tax, but before personal tax. The averages at the bottom of the table are calculated using weights reflecting the relative importance of the various asset types and the different modes of finance in Sweden in the late 1980s.

According to the estimates in Table 2.5, the corporate tax reform hardly affected the average cost of capital for Swedish corporations, as the effect of the lower corporate tax rate was on average offset by the broadening of the corporate tax base. The cost of capital associated with investment in machinery and buildings did fall somewhat, but this was counteracted by a higher cost of capital for inventories due to the abolition of the favourable rules for inventory write-down. The variation in the cost of capital across asset types does not appear to have fallen as a result of the reform; if anything, it seems to have increased slightly because of the rise in the cost associated with the holding of inventories. However, the 1991 corporate tax reform did improve tax neutrality towards the choice of the mode of investment finance. As shown in the bottom part of Table 2.5, the tax benefits to debt finance relative to equity finance were significantly reduced by the reform. In Section 2.6 we shall further discuss the extent to which the corporate tax reform improved tax neutrality.

The taxation of companies with active owners

An important challenge under a dual income tax is to prevent highly taxed labour income from being transformed into lightly taxed capital income. For example, controlling shareholders who work as managers in their own company can choose to receive income from the firm in the form of a management salary or in the form of dividends or capital gains on shares. Even though the tax reform of 1991 maintained the double taxation of corporate equity income, the sum of the corporation tax and the personal capital income tax on dividends and capital gains was somewhat lower than the sum of social security contributions and personal labour income tax levied on high-income earners. Active owners of closely held companies could therefore potentially avoid part of their tax burden by receiving dividends or capital gains rather than wage and salary income from the company.

To prevent such tax avoidance, the tax reform introduced special rules for the taxation of income from shares in closely held corporations (fåmansföretag) where a shareholder – or a closely related person – is working to a significant degree in the company. For such shareholders a dividend from the company would only be taxed as capital income up to a limit given by a so-called "normal dividend" (normalutdelningen), while dividends above this limit would be taxed as labour income. The normal dividend was calculated by multiplying the acquisition cost of the shares by an imputed rate of return equal to the average interest rate on government bonds plus a risk premium of five percentage points. If the actual dividend in any year fell short of the imputed normal dividend, the remaining amount would be carried forward and added to the normal dividend in future years, and it would also be added to the base for calculating the future imputed returns. When an active shareholder of a closely held company realized a capital gain on his shares, any gain up to a limit given by the accumulated normal dividends would be taxed as capital income. Gains in excess of the accumulated normal dividend would be split into one half being taxed as labour income and another half being taxed as capital income. In addition, there was a cap on the total amount of capital gain that could be taxed as labour income.

These rules for taxation of dividends and capital gains on shares in closely held corporations (popularly referred to as the "3:12 rules"[6]) clearly limited the scope for active owner-managers to engage in tax avoidance. However, the rules were also controversial and were changed several times during the subsequent years, as we shall see in the next chapter.

The taxation of sole proprietorships and partnerships

From an economic viewpoint income from self-employment consists partly of a remuneration of the work effort of the entrepreneur and partly of a return on the capital he/she has invested in the firm. Under a dual income tax with separate taxation of labour income and capital income, an equal tax treatment of employees and the self-employed therefore requires that the income of the latter be split into a labour income

[6] The rules were named so because they were previously incorporated in paragraph 3:12 of the Swedish state income tax code.

component and a capital income component. Further, there is the issue of ensuring an equal tax treatment of the retained profits of incorporated and unincorporated firms when the marginal labour income tax rate is far above the corporate tax rate and capital gains on shares are untaxed until the time of realization.

The fathers of the 1991 tax reform recognized these point as a matter of principle, but it was not until the beginning of 1994 that the owners of sole proprietorships and partnerships were given the option to have parts of their income taxed as capital and corporate income. The new optional income splitting rules treated an imputed rate of return to the net equity of the firm as capital income. The residual profit was subject to social security tax and personal labour income tax in so far as it was distributed from the firm. However, if the residual profit was retained in the firm and allocated to a so-called expansion fund, it would only be subject to a preliminary tax of 30 percent, corresponding to the corporate income tax rate. The expansion fund system was intended to enable the owners of unincorporated firms to retain and accumulate profits on the same tax terms as corporations. When income allocated from the expansion fund was subsequently distributed from the firm, it was "grossed up" by the preliminary tax already paid, and the grossed-up amount was taxed as labour income, with a credit being granted for the preliminary tax.

Although complex, the main rules for the taxation of proprietorships have remained fairly stable since their introduction. In Chapter 7 we shall return to the issue of the taxation of small business firms.

2.5 The reform of consumption taxes

The 1991 tax reform involved an increase in consumption taxes which contributed a substantial part of the financing of the cuts in the personal labour income tax. The reform also changed the structure of indirect taxation.

The reform of the VAT

Before the tax reform the Swedish VAT base was rather narrow. Services were for the most part exempt, although a reduced rate of

60 percent of the standard VAT rate was applied to hotel and restaurant services. A similar reduced rate applied to building constructions. The consumption of energy was fully exempt from VAT and subject only to excises.

The tax reform implied a substantial broadening of the VAT base and brought the base much closer in line with the VAT base in the EU. Most of the previously untaxed consumption items became taxable, and all taxable consumption was subjected to the standard VAT rate of 23.47 (as a temporary stabilization policy measure, the VAT rate was actually raised to 25 percent from mid-1990 to the end of 1991, but this was not a part of the tax reform itself). Thus the reduced rates for hotel and restaurant services and construction were abolished, and all kinds of energy consumption became taxable, as did a number of other previously untaxed services such as collective passenger transport. However, some important consumption items remained tax exempt, including medical and dental care, education, child care, housing rents and financial services. Certain cultural services also remained exempt.

The reform of excise taxes

In the area of excise taxation the tax reform introduced a new carbon tax on fossil fuels as well as a sulphur charge. Moreover, the existing fuel taxes became more systematically differentiated according to their environmental effects.

To limit the increase in the overall tax burden on energy products, the existing excise taxes on oil, coal and natural gas were lowered by 50 percent. As a result of the switch from excises to value added taxation of energy products, the tax burden on these products actually fell for Swedish exporting firms which received a refund of the VAT paid on their inputs and were exempt from VAT on their export sales, in accordance with the general destination principle underlying the European VAT.

Finally, as a simplification measure, the tax reform abolished a number of minor excise taxes.

2.6 Evaluation of the Tax Reform of the Century

The Tax Reform of the Century implied a major reshuffling of the Swedish tax structure. One might therefore think that the reform offered a very good opportunity to identify the effects of tax policy changes on income distribution and resource allocation. However, unfortunately the Swedish economy fell into a deep recession right after the reform. Between 1991 and 1993 GDP fell by more than five percent, and open unemployment (excluding persons enrolled in various labour market programs) rose from less than two percent to more than eight percent of the labour force. Asset prices tumbled, and residential construction activity came almost to a standstill. Moreover, as a result of the speculative attack on the European Monetary System, Sweden was forced to abandon its fixed exchange rate policy and switch to a floating exchange rate in November 1992. The resulting exchange rate adjustments led to significant short-run changes in the relative prices of traded and non-traded goods. Because of these dramatic changes in business cycle conditions from a state of overheating in 1990-91 to a state of deep recession bordering on depression a couple of years later, it is very difficult to disentangle the economic effects of the tax reform from the effects of the business cycle, as emphasized by Agell, Englund and Södersten (1996).

With this important caveat in mind we will briefly report the findings from some of the many studies of the effects of the tax reform which were undertaken in the years following the reform.

Effects on income distribution

Despite the large cut in marginal tax rates and the extensive broadening of tax bases, the politicians behind the tax reform were keen to emphasize that it would be distributionally neutral. The study by Björklund, Palme and Svensson (1995) suggests that the reform did in fact have very little impact on the aggregate amount of redistribution of personal annual incomes. The limited distributional impact of the tax reform resulted from several counteracting changes in the structure of the tax-transfer system. The sharp drop in marginal tax rates on earned income certainly tended to increase the degree of inequality, but the broadening of the capital income tax base and the resulting rise in the average

effective tax rate on capital income (as opposed to the marginal statutory rate) worked in the direction of greater equality, since capital income is concentrated in the upper part of the income distribution. Moreover, the reform increased child and housing allowances, and this also tended to benefit individuals and families with relatively low annual incomes. The net effect of these changes was that the overall income distribution was not very much affected in the longer term.[7]

Effects on resource allocation and economic efficiency

As indicated by Table 2.3, the tax reform substantially reduced the variations in effective marginal tax rates across different savings vehicles. In particular, the reform reduced the tax discrimination against financial saving and the tax benefits to savings in real assets, and Figure 2.3 strongly suggests that household portfolios did indeed respond to this change in incentives. This impression is confirmed by the econometric study by Agell, Berg and Edin (1995) and by the analysis in Agell, Englund and Södersten (1995, Ch. 3). These authors find that the tax reform explains a significant part of the increase in the financial savings rate of Swedish households and the concomitant drop in savings invested in owner-occupied housing and consumer durables, although the changing macroeconomic environment was also an important explanatory factor.

In a long run perspective, the greater neutrality in the taxation of different savings vehicles improved the allocation of savings. But perhaps the greatest achievement of the 1991 tax reform was the reduction of the average and marginal tax burden on labour (which was extremely high before the reform) combined with a higher average and marginal effective tax rate on housing investment (which was heavily subsidised by the old tax system). Even with very conservative assumptions on the responsiveness of labour supply to taxation, the cut in marginal tax rates significantly reduced the loss of economic efficiency from the taxation of labour, as indicated by the estimates presented by Agell, Englund and Södersten (1996, p. 658). The reason is that since marginal tax

[7] However, in the short term high-income earners did not contribute as much as planned to the financing of the tax reform, mainly because the sharp recession of 1992-93 and the concomitant capital losses on shares and other assets temporarily reduced the capital income tax base.

rates were so high before the reform, the marginal tax rate cuts implied large increases in take-home pay, as we saw in Figure 2.2. The increase in the tax burden on housing capital helped to finance the labour income tax cuts, but it also improved economic efficiency by significantly reducing the previous tax subsidies to housing investment.

However, these long run efficiency gains did come at a short term cost. In the short run the improved incentives for financial saving and the heavier tax burden on investment in housing and other consumer durables reduced the aggregate demand for goods and services, thereby exacerbating the serious recession of the early 1990s.

According to the estimates in Table 2.5, the corporate tax reform of 1991 hardly affected the average cost of corporate capital. On this basis one would not expect to find significant effects of the tax reform on the aggregate volume of corporate investment. The econometric study by Auerbach, Hassett and Södersten (1995) did in fact indicate that investment was more or less unaffected by the reform.

Indeed, Kanniainen and Södersten (1994) have suggested that the pre-reform corporate tax system may have been close to neutral, in contrast to the widespread belief among policy makers. Kanniainen and Södersten pointed out that a large fraction of Swedish corporations did not fully exploit all available tax allowances before the reform. They attribute this to the Swedish civil law convention of so-called uniform reporting which means that companies cannot pay dividends in excess of their accumulated and current after-tax profits as measured by the tax code, that is, profits after deduction for fiscal depreciation and other tax allowances. If a company wanted to pay dividends, it thus had to report positive taxable profits, and this often implied that it could not fully exploit all of the very generous deductions and allowances before the reform. The existence of unused allowances means that if a company undertakes an investment that increases taxable profits, this additional profit can be shielded from tax by making greater use of available tax allowances. At the margin of investment, the effective corporate tax burden will then be zero, so the corporation tax will be non-distortionary.

However, for companies whose earnings enabled them to take full advantage of all available deductions, as assumed in the calculations underlying Table 2.5, the corporation tax did in fact

distort the cost of capital and the choice between debt finance and equity finance. At a four percent inflation rate, these companies faced a cost of capital that could vary between 2 and 6 percent depending on the mode of investment finance, as indicated by the bottom part of the second row in Table 2.5. By contrast, because it did not have to pay tax at the margin, a company with unutilized allowances would face a cost of capital of 4 percent, corresponding to the real pre-tax rate of return assumed in Table 2.5. Hence the required pre-tax returns on investment could vary significantly across firms under the old tax system.

After the tax reform the available tax allowances were greatly reduced. This suggests that the corporate tax reform improved the allocation of capital across companies by putting most corporations in a situation where they could utilize all available deductions and therefore faced the same cost of capital for any given mode of finance.

In the area of indirect taxation the introduction of new environmental taxes and the differentiation of existing fuel taxes according to their detrimental environmental effects probably improved the efficiency of resource allocation by helping to internalize environmental externalities. The move towards greater uniformity of the VAT could in theory have been harmful to economic efficiency if the goods and services that became subject to higher VAT were more highly substitutable for leisure than the goods already subject to the standard VAT. In such a scenario the move to a uniform VAT would have exacerbated the existing tax distortions to labour supply by encouraging substitution away from work towards leisure. However, there is no indication that the VAT reform had such a systematic bias, and the move towards a uniform VAT helped to finance a cut in other taxes that were probably more distortionary at the margin.[8]

In summary, the tax reform of 1991 represented a bold experiment in tax policy based on a clear set of principles that led to a much more consistent tax system. Although the timing of the reform turned out to be unfortunate by tending to exacerbate a serious recession, there are strong reasons to believe that the Tax Reform of the Century contributed to a more efficient allocation of resources in the long run without sacrificing the goal of equity in taxation.

[8] Chapter 5 will discuss the arguments for and against a uniform VAT in more detail.

The next chapter will study how the principles of the 1991 tax reform have stood up against the test of time.

3 Trends in Swedish tax policy since the tax reform of the century

Although based on a clear set of principles, the new Swedish tax system created by the tax reform of 1991 soon came under pressure due to the economic and political instability created by the severe economic crisis of the early 1990s. In more recent years the tax policy principles of uniformity and neutrality underlying the Tax Reform of the Century have also been challenged as policy makers have experimented with new tax designs and selective tax cuts in their efforts to promote employment and entrepreneurship. Furthermore, tax policy has come to play a more important role as a means of supporting environmental policy goals.

To set the stage for our discussion of current and future Swedish tax policy in the subsequent chapters, this chapter briefly surveys the most important tax policy changes since the tax reform of 1991.

3.1 Changes in tax structure since 1991

Table 3.1 shows how the Swedish tax structure has evolved since the Tax Reform of the Century. We see that the personal income tax accounted for a smaller share of total tax revenue in 2008 than in 1991, but to a large extent this has been offset by a rise in the revenue share generated by the corporate income tax. The latter development does not reflect a tightening of corporate tax policy. Instead, it seems to stem from structural changes that have boosted the corporate tax base relative to GDP. For example, when the tax code allows accelerated depreciation of physical business assets, the declining importance of physical relative to intangible assets on

corporate balance sheets will strengthen the corporate tax base. Over time a greater share of total business activity also tends to be carried out in the corporate organizational form as the number of farmers and small shopkeepers goes down. As a consequence, the corporate tax base will expand at the expense of the personal income tax base.

Table 3.1 Evolution of the Swedish tax structure since the tax reform of 1991 (percent of total receipts)

	1991	2008
Taxes on personal income	33.5	29.4
Taxes on corporate income	3.5	7.0
Social security contributions	29.1	24.9
Payroll taxes	3.5	8.4
Property taxes	4.0	2.3
Taxes on goods and services	26.4	27.9
VAT	16.4	20.1
Excise taxes	10.0	7.8
Miscellaneous taxes	0.1	0.1
Share of taxes in GDP (percent)	53.7	47.1

Source: Revenue Statistics of OECD Member Countries (SourceOECD).

Just as the sum of corporate and personal income taxes contributed almost the same share of total revenue in 2008 as in 1991, the sum of social security taxes and payroll taxes also generated about the same revenue share, although payroll taxes have become more important relative to social security contributions. At the margin the economic effects of a payroll tax and a social security contribution are roughly the same if the latter does not entitle the taxpayer to additional social security benefits. Hence it may not matter much from an economic viewpoint whether an impersonal tax on labour income is labelled as a social security contribution or as a payroll tax.

As indicated in Table 3.1, property taxes have become a less important revenue source, but this has been roughly offset by an increase in consumption taxes. The greater consumption tax revenue has come from the VAT, whereas excises taxes provide a smaller share of total revenue.

Let us now consider some recent changes in tax design within each of the main categories of tax.

3.2 Trends in consumption taxes

The Value Added Tax

The 1991 tax reform package included a uniform VAT rate of 23.46 percent applied to a broad base defined in accordance with the EU VAT Directives (as a temporary stabilisation policy measure which was not part of the tax reform itself, the VAT rate was raised to 25 percent between July 1 and December 31, 1991).

Although the policy makers behind the 1991 tax reform stressed the advantages of a broad-based uniform VAT, the new VAT regime began to unravel already from the beginning of 1992. As the economic crisis deepened, politicians had to strike a difficult balance between competing goals such as the desire to stabilise the economy, the need to protect government revenue, and the wish to secure a fair sharing of the burden of the crisis. As part of their crisis management, politicians resorted to a differentiated VAT, and as their emphasis on the various policy goals shifted back and forth over time, and when new policy objectives emerged after the crisis, numerous changes in VAT legislation resulted. The following chronological list of changes in VAT rates illustrates the frequency of policy shifts and the lack of consistency in VAT policy since the Tax Reform of the Century:

- 1992-01-01: food, waiting services, hotel and camping, passenger transport, ski lifts (VAT rate reduction from 25% to 18%)
- 1993-01-01: food, waiting services, hotel and camping, passenger transport, ski lifts (VAT rate increase from 18% to 21%)
- 1993-07-01: hotel and camping, passenger transport, ski lifts (VAT rate reduction from 18% to 12%)
- 1994-03-01: postal services (VAT rate reduction from 25% to 12%)
- 1995-01-01: waiting services (VAT rate increase from 21% to 25%)

- 1995-01-01: postal services (VAT rate increase from 12% to 25%)
- 1995-11-01: works of art and antiques (from exemption to reduced VAT rate of 12%)
- 1996-01-01: food (VAT rate reduction from 21% to 12%)
- 1996-01-01: newspapers (from zero rating to reduced VAT rate of 6%)
- 1996-07-01: movie theatres (from exemption to reduced VAT rate of 6%)
- 1997-01-01: koncerts, opera, ballet etc. plus certain copyrights (from exemption to reduced VAT rate of 6%)
- 1997-01-01: certain sports (from exemption to VAT of 6%)
- 1997-01-01: certain museums and libraries (from exemption to reduced VAT rate of 6%)
- 1997-01-01: certain archives (from exemption to standard VAT rate of 25%)
- 1997-01-01: certain types of education (from exemption to standard VAT rate of 25%)
- 2001-01-01: passenger transport (VAT rate reduction from 12% to 6%)
- 2001-01-01: animal parks (VAT rate reduction from 25% to 6%)
- 2002-01-01: books and periodicals etc. (VAT rate reduction from 25% to 6%)

The end result of all the above policy changes is a current Swedish VAT system involving a standard VAT rate of 25% applied to most goods and services, a reduced rate of 12% applied to foodstuffs, non-alcoholic beverages, hotel services and ski-lifts, and another reduced rate of 6% applied to a number of cultural services as well as sports events, passenger transport and books, newspapers, and periodicals.

Table 3.2 summarises the reasons that were given for the various VAT policy changes since the 1991 reform. The stated reasons include a variety of policy goals (note that some consumption items appear more than once in the table because they have been subject to VAT rate changes on more than one occasion). The bottom row of Table 3.2 shows that the reduced VAT rates have been estimated to imply a revenue loss of about 2 percent of the actual total tax revenue collected, compared to a situation with a uniform 25% VAT rate on all taxable consumption.

The bulk of the revenue loss stems from the reduced VAT rate on food items. This rate reduction was originally seen as a way of curbing inflation, but later it was defended as a way of offsetting the distributional effects of the cuts in social welfare benefits forced by the fiscal crisis that followed in the wake of the general economic crisis. In Chapter 5 we shall argue that a reduced VAT on food is a very inefficient way of pursuing distributional goals.

Despite the revenue loss from the introduction of reduced VAT rates, Table 3.1 showed that the VAT has come to account for a larger share of total tax revenue since 1991. However, since the overall tax burden has fallen, the ratio of VAT revenue to GDP has grown by a relatively modest amount, from 8.8% in 1991 to 9.4% in 2008.

Table 3.2 Reductions in VAT rates implemented after the tax reform of 1991*

Purpose of VAT reduction	Goods and services favoured	VAT rate (%)	Revenue loss (% of total tax revenue)
Sports: cost neutral treatment compared to exemption	Sports events and sports exercise	6	0.14
Culture: cost neutral treatment compared to exemption	Concerts, circus, theatre, opera, ballet, libraries, commercial museums, archives, copyrights	6	0.12
Neutral competitive position vis á vis imports	Works of art	12	0+
Strengthening of democracy	Newspapers	6	0.10
Stimulus to reading	Books, periodicals	6	0.14
Promotion of tourism	Hotel services, camping, skilifts, passenger transport	12	0.07
Compensation for excise tax increase on diesel	Passenger transport	6	0.27
Reducing inflation	Food and non-alcoholic beverages	21	
Offsetting distributional effect of reduced social transfers	Food and non-alcoholic beverages	12	1.31
Total revenue loss from reduced VAT rates (% of total revenue)			**2.01**

* The estimated revenue losses are based on 2005 data. Some consumption items appear more than once in the table because they have been subject to several VAT rate changes.

Source: Adapted from Table 13.1 in SOU 2005:57 (p. 419).

Excise taxes

For many years Sweden has followed the general international trend towards a lower share of excise tax revenue in total tax revenue, as indicated in Table 3.1. One reason for this trend is that the demand for traditional exciseable products such as alcohol and tobacco tends to grow at a slower pace than income and total consumption. Specifically, the expenditure elasticity of demand for alcohol and tobacco in Sweden has been estimated to be less than 0.6, meaning that the demand for these products rises by less than 0.6 percent for every one percent increase in total consumer expenditure (Assarsson, 2005).

In 1995 Sweden became a member of the European Union. Under the general rules of the EU internal market, consumers can freely engage in cross-border shopping and import exciseable products from other EU countries for personal use. This has imposed some constraints on Swedish excise tax policy which has traditionally relied on high excises to curb the consumption of alcohol and tobacco. To ease the transition to the EU internal market regime, Sweden was allowed up until 2004 to maintain quantitative restrictions on the amount of exciseable products that could be imported by private consumers free of Swedish tax. The constraints on Swedish excise tax policy have also been softened by the fact that the "sin" taxes on alcohol and tobacco are likewise very high in the neighbouring countries of Finland and Norway. However, Swedish consumers do have the opportunity to buy cheaper alcohol in other neighbouring countries like Denmark and Germany as well as in the Baltic countries and Poland which joined the EU in 2004. In 1997 Sweden felt it necessary to reduce the excise duty rate on beer by 39%, and in 2001 there was a 19% decrease in wine taxes. The sharp decrease in beer taxes in 1997 was partly reversed in 2008 by a 13% increase, but at the same time wine taxes were further cut by 2%.

Taxes on energy and fossil fuels provide a large share of total excise tax revenue in Sweden. As part of a policy of "tax shifting" ("skatteväxling") towards greater reliance on environmentally-related taxes, the tax rates on many energy products and CO2 emissions have been increased on various occasions during the last two decades, although reduced rates or exemptions have been applied to energy use in the business sector to protect the international competitiveness of Swedish firms. Despite these

attempts at tax shifting, we saw in Chapter 1 that the revenue from environmentally-related taxes in Sweden has been roughly constant relative to GDP since 1995. Again the reason is that the base for these taxes tends to grow at a slower pace than total output, as households and firms have engaged in energy savings that have reduced the average input of fossil fuels per unit of GDP. Nevertheless, since total tax revenue relative to GDP has fallen since 1991, environmentally-related taxes have come to account for a larger share of total revenue. In Chapter 5 we shall discuss whether there is scope for a continuation of this trend.

The tax credit for purchase of household-related services

A much-debated recent tax policy initiative was the introduction in 2007 of a tax credit for the purchase of so-called household-related services (hushållstjänster). Inspired by a similar Finnish experiment, this initiative was intended to promote employment among low-skilled workers and to counter tax evasion. Under the new Swedish scheme taxpayers are entitled to a credit against their personal income tax amounting to 50 percent of the labour costs associated with the purchase of certain consumer services such as cleaning, window-cleaning, gardening, washing, cooking, child care, snow clearing etc. The services must be performed in the taxpayer's home or in close connection with it, and the tax credit cannot exceed 50,000 SEK per year per person. From December 2008 the tax credit was expanded to include refund of 50 percent of the labour costs related to repair and expansion of single-family homes and owner-occupied apartments, although the 50,000 SEK limit was maintained.

In 2007 the Swedish government also announced plans to exempt certain parts of the service sector from social security tax, subject to approval from the European Commission. The exemption was supposed to apply to repair and maintenance of cars and boats, restaurant and hotel services, taxis, cleaning services, shoemakers, hairdressing, personal care etc. However, based on its interpretation of the EU rules that restrict state aid to the business sector, the European Commission was only willing to approve an exemption from social security tax for small and medium-sized enterprises, defined as firms with less than 250 employees. Fearing that such a threshold would distort competition between small and

large firms, the Swedish government gave up its plans to introduce social security tax exemptions targeted at the service sector (Finanspolitiska rådet, 2008).

Some critics have seen the introduction of selective tax cuts for household-related services as an unwarranted deviation from the principles of uniform and neutral taxation underlying the 1991 tax reform. However, Chapter 5 will argue that such targeted tax cuts may be justified as a second-best policy measure, since the services in question are near-perfect substitutes for untaxed home production and for untaxed services delivered from the underground economy.

3.3 Recent trends in labour income taxation

Värnskatten

The Tax Reform of the Century aimed to keep the top marginal personal tax rate on labour income down to 50 percent in an average municipality. In reality the average top marginal personal tax rate ended up at around 51 percent in 1991, due to increases in the local government income tax.

The deep economic crisis of the early 1990s and the fiscal adjustments forced by the crisis intensified political discussions on how to secure a fair sharing of the burden of adjustment. Shortly after a new Social Democratic government had taken office in late 1994, it introduced the so-called "värnskatt" ("protective tax") as part of a fiscal package intended to consolidate the public finances. The värnskatt was originally a temporary tax, levied for the income years 1995-1998 at a rate of 5 percent on the earned income of all individuals paying the ordinary central government income tax of 20 percent, giving a total central government tax rate of 25 percent. However, from 1999 a part of the värnskatt was made permanent by the introduction of a second bracket in the central government income tax schedule with a tax rate of 25 percent, whereas the tax rate for the lower bracket was taken back to the original 20 percent.

As a consequence of the värnskatt and of further increases in local income taxes, high income earners now face a top marginal personal tax rate of about 57 percent in an average municipality. The värnskatt has created some controversy over the years, since it has been seen as a step back from the philosophy of the 1991 tax

reform which tried to avoid the very high marginal tax rates that had created so many distortions and tax planning activities in the past. In Chapter 6 we shall see that the värnskatt may well cause a net revenue loss, once the behavioural responses of taxpayers are allowed for.

The Earned Income Tax Credit (jobskatteavdraget)

In line with many other OECD countries, Sweden has recently introduced an Earned Income Tax Credit (EITC, "jobbskatteavdraget" in Swedish terminology). The EITC is a tax credit that depends on the taxpayer's labour income, and it was gradually expanded in four steps between 2007 and 2010. The size of the credit increases with earned income up to a certain level, so for taxpayers in these income ranges the EITC reduces the marginal as well as the average tax rate on labour income. For earned income above 296,800 SEK (in 2010), the EITC is a fixed amount which only reduces the average tax rate.

The EITC was introduced with the purpose of increasing employment through a higher labour supply, especially among low-income earners by raising their participation rate. The detailed rules for calculating the EITC are complex, as we shall see in Chapter 6, and they have been criticised for being so intransparent that the incentive effect of the credit may be weakened. In response to this critique, the special EITC rules for individuals above 65 years of age were simplified from the beginning of 2010.

Another important change in the taxation of labour income was introduced in 1997 when recipients of earned income were compensated for the so-called general pension contribution (den allmänna pensionsavgiften). This social security contribution is levied at a rate of 7 percent on labour and transfer incomes up to a certain threshold, but from 1997 taxpayers receive a tax credit amounting to 7 percent of their income up to that same threshold. However, unlike the principle underlying the EITC, the relief for the general pension fee is granted to recipients of transfers (apart from pensions) as well as to earners of labour income, so the tax relief does not increase the incentive for individuals of working age to move from non-employment into employment. The revenue loss from this policy measure is somewhat lower than the revenue shortfall implied by the EITC.

Selective cuts in social security taxes

Recently the Swedish government has also experimented with selective social security tax cuts for certain groups in the labour market, starting from mid-2007. Social security tax rates for individuals aged 18-25 years have been roughly cut in half. Moreover, individuals who have been out of work for a longer period due to unemployment or illness are now exempt from social security tax for a similar period after the time of unemployment (up to a maximum period of five years). Targeted social security tax cuts are also applied to certain newly arrived groups of immigrants and to individuals above 55 years with a long period of unemployment behind them.

The recent selective social security tax cuts are discussed by the Swedish Fiscal Policy Council (2008, pp. 208-212) which notes that these changes have made the tax system more complex and less transparent. The Council is critical of the tax cut for youngsters, arguing that this selective measure is poorly targeted at groups with few employment opportunities. At the same time the Fiscal Policy Council argues that the social security tax cuts for newly arrived immigrants and people with a long period of unemployment behind them may be justified, since these groups have indeed had difficulties finding stable employment.

3.4 Trends in the taxation of business income

The taxation of corporate source income

The rules for taxation of corporate source income were characterized by considerable instability in the years following the 1991 tax reform. Under the new system of capital income taxation established by the reform, dividends and realized capital gains on shares were fully included in the taxpayer's personal capital income, but as Chapter 2 explained, there was some double tax relief at the corporate level in the form of the Annell deduction for new share issues and in the form of the new deduction for allocations to the so-called SURV reserve.

However, motivated by a desire to stimulate household investment in shares, the new Swedish centre-right government taking office in 1991 preferred to alleviate the double taxation of corporate income at the shareholder level. Impressed by growing

capital mobility, the new government also wanted further cuts in taxes on capital. From 1994 the corporate tax rate was therefore reduced to 28 percent, and the government announced its intention to further cut the corporate tax rate as well as the flat personal capital income tax rate to 25 percent from 1995. Moreover, from the start of 1994 the personal capital income tax on dividends paid out from Swedish companies to Swedish residents was abolished, and the personal capital income tax on capital gains on shares was reduced to 12.5 percent. To finance these measures, the Annell deduction and the SURV system were abolished.

The Social Democratic opposition party opposed these changes, and when it came back into government in the fall of 1994, it reinstated the 30 percent personal capital income tax on dividends and capital gains on shares, taking effect from 1995. The Social Democrats considered shareholder tax relief to have undesirable implications for income distribution, and they believed that double tax relief at the corporate level would be a more effective means of reducing the cost of corporate capital in the open Swedish economy. Yet, in the short term the 1995 tax changes took Sweden back to a classical corporate tax system with full taxation at the corporate as well as the shareholder level. There was a growing perception that the domestic personal taxes on dividends and capital gains did not have much impact on the cost of capital for large corporations which could raise capital in the international equity market, whereas these taxes might have a significant impact on the cost of capital for the smaller corporations without access to the international capital market. From 1997 dividends received from *unlisted* companies therefore became exempt from personal capital income tax in so far as they did not exceed an imputed after-tax rate of return on the sum of the acquisition cost of the shares and the company's wage bill. If no dividends were paid out, the amount of dividend which could have been distributed free of personal tax were added to the basis value of the shares, thereby ensuring relief of capital gains tax when the shareholder sold the shares.

This method of partial double tax relief lasted until 2006 when it was abolished at the same time as the personal tax rate on dividends from unlisted companies was reduced to 25 percent.

From 2009 the statutory corporate tax rate was cut from 28 percent to 26.3 percent, financed by the introduction of certain restrictions on the deductibility of interest on debt incurred to

finance the acquisition of shares in a related entity within a corporate group. These changes were motivated by a desire to promote investment in Sweden and to reduce the vulnerability of the Swedish tax base to tax planning activities and corporate takeovers exploiting the deductibility of interest.

The taxation of companies with active owners

As mentioned in Chapter 2, the 1991 tax reform introduced special rules for the taxation of income from companies with a few active owners to prevent corporate owner-managers from transforming highly taxed labour income into lightly taxed capital income. These so-called 3:12 rules (named after the paragraph of the income tax code in which they were originally included) turned out to be a bone of contention in the subsequent years, with business representatives arguing that they were much too harsh.

The original 3:12 rules implied that dividends and capital gains up to an imputed "normal" dividend on the basis value of the shares would be taxed as capital income, whereas additional income from the shares would be taxed progressively as labour income (with some limitations on the amount of capital gain that could be taxed as labour income). Representatives of the business community argued that under these rules much income that was in fact a reward for risk-taking or a return to investment in intangible assets became subject to the high marginal labour income tax rate whereas it should have been taxed as capital income.

In the period 1995-97 the government responded to this critique by allowing an increasing share of the wage bill to be included in the base for calculating the imputed normal dividend under the 3:12 rules. For the owner-managers of larger companies this so-called wage bill rule (lönesummeregeln) became the most important tax shield against progressive labour income tax on the income from their company. However, for smaller firms the wage bill rule only implied a modest tax relief, since only wage bills above a certain threshold could be included in the base for calculating the normal dividend (Lodin, 2009, p. 300).

Continued dissatisfaction with the 3:12 rules therefore led to further relaxation of the rules from 2006. The wage bill rule became more generous in that 25 percent of the company's total wage bill plus a further 25 percent of the wage bill above a certain threshold

could be included in the normal dividend. In addition, the risk premium included in the imputed normal dividend was raised. Finally, from 2009 the minimum management salary allowing owner-managers to take advantage of the wage bill rule was lowered.

As a consequence of all the changes implemented since 1995, the rules for the taxation of companies with active owners are now a lot more liberal than they were in 1991. Chapter 7 will return to the issue of how these firms and their owners can be taxed in a fair and efficient manner under a dual income tax.

3.5 The decline in property taxes

The level and structure of property taxes have changed significantly since the Tax Reform of the Century. Between 1991 and 2008 the share of property taxes in total revenue and in GDP was almost cut in half, as indicated in Table 3.3. This remarkable development was mainly the outcome of a cut in taxes on immovable property and a reduced reliance on stamp duties, but it also reflected the abolition of the inheritance and gift tax from 2005 and the abolishment of the wealth tax from 2008. The wealth tax was scrapped because it was seen as highly distortionary, involving very different effective tax rates on different asset types, and because it created an incentive for capital flight from Sweden. The motives for the abolition of the inheritance and gift tax are less clear, but apparently one concern was that this tax was perceived as an obstacle to the smooth transfer of ownership of small businesses from one generation to the next.

As mentioned in Chapter 2, the tax reform of 1991 involved some increase in the tax on immovable property (fastighetsskatten), as part of the effort to secure a neutral tax treatment of different forms of saving and investment. However, as a result of its continued unpopularity, the recurrent property tax was significantly reduced over the period 2006-2008. Indeed, from January 1, 2008 the central government tax on immovable property was completely abolished and replaced by a very low property tax payable to the local municipality. Whereas the previous property tax was proportional to the assessed value of the property, the new property tax for villas is a fixed amount of 6,000 SEK per year, although with a cap equal to 0.75 percent of the assessed property

value. For apartment buildings the new property tax amounts to 1,200 SEK per apartment, with a cap of 0.4 percent of the property value.

Table 3.1 The evolution of property taxes in Sweden

	1991		2008	
	Percent of total revenue	Percent of GDP	Percent of total revenue	Percent of GDP
Recurrent taxes on immovable property	2.13	1.14	1.62	0.76
Recurrent taxes on net wealth	0.32	0.17	0	0
Estate, inheritance and gift taxes	0.20	0.11	0	0
Taxes on financial and capital transactions	1.38	0.74	0.71	0.34
Property taxes in total	**4.03**	**2.16**	**2.33**	**1.10**

Source: Revenue Statistics of OECD Member States (Source OECD).

For the bulk of all residential property, this reform means that the tax is no longer related to the market value of the property and that the recurrent property tax is significantly lower than before. To make up for part of the resulting revenue loss, the tax rate on realized capital gains on owner-occupied villas and apartments was raised from 20 to 22 percent. To limit lock-in effects, taxpayers were previously allowed to defer all of their capital gains tax bill in so far as they reinvested their gains in a new residential property, but under the new rules the amount of gain that may be deferred is capped at 1.6 million SEK. Moreover, to limit the benefit from tax deferral, taxpayers are obliged to include an imputed interest rate of 1.67 percent of the deferred capital gain in their annual taxable capital income.

Despite this tightening of the capital gains tax, the net result of the 2008 property tax reform was that investment in owner-occupied housing is now much more lightly taxed than investment in business assets. By contrast, right after the 1991 tax reform the tax system was roughly neutral towards investment in these two asset types, according to estimates presented by the Swedish Fiscal Policy Council (2008, p. 223).

3.6 Trends in Swedish tax policy since the Tax Reform of the Century: a summary

The new design for the Swedish tax system emerging from the ambitious tax reform of 1991 has stood the test of time in several important ways. In the sphere of personal income taxation, the basic principles of the dual income tax have by and large been maintained. The introduction of an Earned Income Tax Credit in 2007 was an important innovation in the taxation of labour income. The EITC was mainly intended to stimulate labour force participation, whereas the marginal tax rate cuts included in the 1991 reform were perhaps more focused on the goal of increasing the hours worked by those already employed. Yet both of these policy measures aimed at increasing total labour supply, so in this sense they are quite consistent.

Moreover, in the area of corporate income taxation Swedish policy makers have stuck to the important principle of combining a broad tax base with a relatively low tax rate, rather than trying to fine tune the level and composition of business investment through various special deductions and allowances that would require a higher tax rate to generate the same revenue. Still, it is highly debatable whether the various tax concessions granted to active owners of closely held corporations since the 1991 tax reform have improved the neutrality of the tax system towards the choice of alternative forms of business organization, as we shall see in Chapter 7.

The move towards reduced social security taxes for selected groups in the labour market and the introduction of a tax credit for the purchase of household-related services might be seen as an unwarranted departure from the principles of uniform taxation underlying the Tax Reform of the Century. But as we will discuss in chapters 5 and 6, there may be a good theoretical case for policies of this kind, even if the specific design of the current policies may be less than optimal.

The most important departures from the principles of the 1991 tax reform have been the move towards a differentiated VAT, the introduction of an additional surtax on high-income earners (the värnskatt), and the substantial tax subsidy to investment in owner-occupied housing implied by the 2008 property tax reform. As our analysis of future challenges for Swedish tax policy will suggest,

these breaks with the principles of the 1991 tax reform were unfortunate and should be reconsidered.

4 The deadweight loss from taxation in Sweden

Along with the public services and transfers they finance, taxes are important instruments for redistributing income. But since taxes drive a wedge between the social (pre-tax) and the private (after-tax) returns to work, saving and investment, they distort economic incentives in a way that reduces the total "size of the pie" available for redistribution. Because of this so-called deadweight loss from taxation, tax policy faces a dilemma between equity and economic efficiency: a higher degree of redistribution from the rich to the poor requires higher marginal tax rates, and the resulting weakening of incentives creates a greater deadweight loss.

A rational tax policy must trade off the goal of redistribution against the goal of minimizing the deadweight loss that makes society as a whole poorer. When designing the tax system, policy makers must think about the weight they attach to the economic welfare of different individuals and groups in society, but they must also consider the likely size of the deadweight losses generated by the various tax policy instruments. This chapter focuses on the measurement of these deadweight losses.

As we shall see below, the deadweight loss from an increase in some tax rate may be measured by the share of the initial revenue gain which is lost again when taxpayers change their behaviour in response to the tax increase. As a simplified example, suppose a 1 percentage point increase in the top marginal income tax rate generates an immediate revenue gain of 800 million SEK. If taxpayers react to the tax increase by reducing their labour supply so that tax revenues subsequently fall by 200 million SEK as a result of a smaller tax base, the deadweight loss from the tax increase is 200/800 = 0.25, indicating that 25 per cent of the initial revenue gain is lost again due to the negative labour supply response. If taxpayers react symmetrically to increases and

decreases in taxation, the fractional deadweight loss from a tax increase is identical to the so-called degree of self-financing associated with a tax cut. The degree of self-financing is the fraction of the initial revenue loss from a tax cut that is subsequently recouped when taxpayers react to the lower tax rate by increasing their labour supply etc. so that the tax base expands.
This chapters offers estimates of the deadweight losses caused by increases in (or the degree of self-financing associated with reductions in) the most important taxes in Sweden, namely taxes on labour income, consumption taxes, taxes on business income, and taxes on the return to financial savings. Such estimates should provide useful background information for decisions on future Swedish tax policies. For example, if it turns out that capital income taxes are associated with much larger deadweight losses than labour income taxes, it is natural to ask whether the distributional effects of capital income taxes are sufficiently attractive to justify the current tax structure, or whether there should be some shift from capital income taxes to labour income taxes to improve economic efficiency.

The method we use to estimate deadweight losses accounts for the fact that Sweden is a small open economy with free capital mobility. In such a setting it is very important to distinguish between taxes on savings (mainly the personal tax on capital income) and taxes on investment (mainly the corporation tax), since the two types of tax have very different effects, as we shall see. Our calculation of deadweight losses also accounts for the *interaction* among tax bases, that is, the fact that a higher tax rate on a certain tax base triggers a behavioural response that tends to reduce not only that tax base itself, but which may reduce other tax bases as well. For example, a higher tax rate on labour income will not only reduce the labour income tax base by discouraging labour supply; it will also reduce the disposable income available for consumption and saving, thereby eroding the consumption tax base and the capital income tax base. In addition, the lower labour supply and the resulting upward pressure on wages will reduce the profitability of business investment in Sweden, thereby diminishing the business income tax base. Our method will allow a decomposition of the total deadweight loss from the increase in some tax rate into the losses stemming from the reduction of the various tax bases and the resulting losses of public revenue.

Section 4.1 explains the general principles underlying our estimates of deadweight losses and the degree of self-financing. Section 4.2 presents the estimated deadweight losses from labour income taxes, consumption taxes, business income taxes, and taxes on the return to financial saving. Section 4.2 also explains the economic mechanisms generating the deadweight losses. In section 4.3 we explore the sensitivity of the size of the deadweight losses to variations in a number of key parameters, to give an impression of the degree of uncertainty attached to the estimates. The final section 4.4 sums up our main findings and discusses their policy implications.

4.1 Measuring the deadweight loss from taxation in a small open economy: general principles

The marginal deadweight loss from taxation: an intuitive account

Suppose the government raises some tax rate so that total net tax revenue increases by 1 billion kronor when taxpayers have fully adjusted their behaviour to the new higher tax rate. Suppose further that taxpayers would in fact be willing to pay a total lump sum amount of 1,200 million kronor if by so doing they could continue to pay the original lower tax rate. It would then be natural to say that the tax increase has created a "deadweight loss" or an "excess burden" equal to 1,200 – 1,000 = 200 million kronor, corresponding to the difference between the burden that the tax hike imposes on taxpayers – measured by the amount they are willing to pay to avoid the tax increase – and the extra net revenue generated by the tax hike.

This is the idea behind the measure of deadweight loss used by tax economists: the marginal deadweight loss (ΔDWL) from an increase in some tax rate equals the difference between the maximum amount that taxpayers would be willing to pay to avoid the tax increase (ΔE) and the additional net revenue accruing to the government (ΔR), that is,

$$\text{Marginal deadweight loss:} \quad \Delta DWL = \Delta E - \Delta R. \qquad (1)$$

Note that ΔE may be seen as the minimum total lump sum transfer that taxpayers would need to receive in order to be just as

well off after the tax increase as they were initially. Thus the marginal deadweight loss may also be described as the difference between the amount that would be needed to compensate taxpayers for the tax hike and the additional revenue actually collected by the government.

The additional revenue generated by the tax increase can be split into the "static" revenue change ΔR^s that would occur if taxpayers did not change their behaviour, and the "dynamic" revenue change ΔR^d resulting from the behavioural responses to the change in the tax rate, i.e., $\Delta R = \Delta R^s + \Delta R^d$. Hence we may rewrite equation (1) as:

$$\Delta DWL = \Delta E - \left(\Delta R^s + \Delta R^d \right). \tag{2}$$

The decomposition of the total revenue change into a "static" and a "dynamic" component is extremely useful, since standard economic theory implies that $\Delta E = \Delta R^s$, as demonstrated formally in Sørensen (2010, section 4). In other words, the static revenue gain will be just sufficient to compensate taxpayers for the tax increase, so the marginal deadweight loss will equal the dynamic revenue loss from the behavioural responses to the tax change.

The intuition for this important result may be explained as follows: if taxpayers did *not* change their behaviour, it is immediately clear that the amount needed to compensate them would equal the static revenue gain from the tax increase, since this compensation would keep disposable incomes unchanged and allow taxpayers to maintain the same level of consumption with the same amount of work effort as before. In reality taxpayers do of course change their behaviour since the tax increase faces them with a new set of net wages and/or consumer prices. However, the behavioural responses induced by a small tax change have a negligible impact on taxpayer welfare when taxpayers have optimized their consumption and labour supply before the tax change, since they will then be indifferent to working and consuming a little more or a little less.[9] Because the behavioural responses to a small tax change have a negligible effect on the economic welfare of taxpayers, an amount equal to the static revenue gain is still (roughly) sufficient to

[9] When households have optimized their labour supply and savings, the after-tax wage received for an extra hour of work is just sufficient to compensate for the loss of an hour of leisure, and the after-tax real return to saving just suffices to compensate for the postponement of one krona of consumption. In that situation the taxpayer is indifferent between working one hour more or less and between saving one krona more or less.

compensate them. To a first approximation, the net deadweight loss to society therefore equals the government's revenue loss from the reductions in labour supply and consumption etc. induced by the tax increase. When the initial tax rates are positive, these behavioural responses to a tax hike generate a negative revenue effect on the public budget, resulting in a net loss to society.

In other words, since optimizing household behaviour implies that $\Delta E = \Delta R^s$, it follows from (2) that $\Delta DWL = -\Delta R^d$. To obtain a measure of the efficiency loss that is independent of the units in which income and revenue are measured, it is useful to express the marginal deadweight loss as a fraction of the static revenue gain. When doing so, we obtain the so-called degree of self-financing:

$$\text{Degree of self-financing:} \qquad DSF = \frac{\Delta DWL}{\Delta R^s} = -\frac{\Delta R^d}{\Delta R^s}. \qquad (3)$$

The *DSF* measures the fraction of the initial revenue gain from a tax increase which is lost again due to behavioural responses. In the case of a decrease in some tax, the *DSF* indicates the degree to which the tax cut pays for itself through behavioural changes that increase the tax base. A positive marginal deadweight loss is thus equivalent to a positive degree of self-financing. When some tax rate is cut, the static revenue effect will always be negative whereas the dynamic revenue effect will typically be positive, since the tax base normally responds positively to a decrease in the tax rate. Thus the degree of self-financing in (3) will normally be a positive number.[10]

Different taxes involve different degrees of self-financing since they have different effects on economic behaviour and hence on tax bases. To illustrate this, and to facilitate the interpretation of the estimates of *DSF*s presented later on, the next subsection will explain the very different effects of taxes on saving versus taxes on investment.

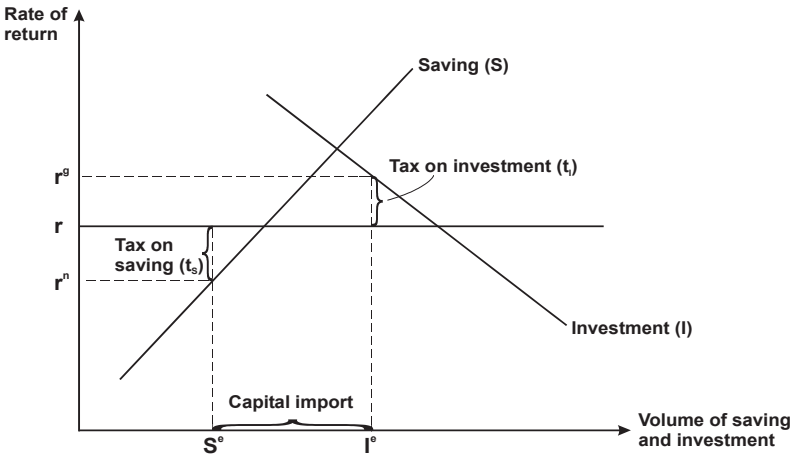
[10] A technical note: our measure of *DSF* involves a thought experiment where taxpayers are kept at the same level of economic welfare before and after the tax change (through appropriate adjustment of some hypothetical lump sum transfer from the government). Hence there are no income effects of the tax change, but only substitution effects, so the behavioural elasticities determining the dynamic revenue effect are compensated wage and price elasticities.

Taxes on saving versus taxes on investment

In an open economy with free international mobility of capital one must distinguish between sourced-based and residence-based taxes on capital. Under the source principle, tax is applied in the country where the investment takes place. In Sweden, the corporate income tax is the most important example of a source-based tax. Under the residence principle, tax is levied on the worldwide savings income of residents, regardless of whether the income derives from foreign or from domestic sources. In Sweden as elsewhere in the OECD area, personal capital income taxes are based on the residence principle.

For an open economy too small to affect the return to internationally mobile capital, the economic impacts of source and residence based taxes can be very different. This is illustrated in Figure 4.1 where the volumes of domestic saving and investment are measured along the horizontal axis and their rates of return are indicated on the vertical axis. The downward-sloping *I*-curve reflects the marginal pre-tax return to domestic investment which declines as a growing volume of investment exhausts the more profitable investment opportunities. The upward-sloping *S*-curve shows how the volume of domestic saving is assumed to increase as the after-tax return to saving goes up. The horizontal line labelled *r* indicates the exogenous world interest rate, or the required international rate of return on shares if we consider equity-financed investment. If the domestic government levies a source-based "tax on investment" t_I (which could be the domestic corporation tax), domestic investment must yield a minimum rate of return r^g in order to provide investors with the rate of return *r* they are able to earn elsewhere in the world. Hence the level of domestic investment will be I^e. If the government also imposes a "tax on saving" t_S, say, in the form of a residence-based personal tax on interest income, the volume of domestic saving will be S^e. The excess of domestic investment over domestic saving must be financed through capital imports, so the current account deficit will be $I^e - S^e$.

Figure 4.1 Taxes on saving versus taxes on investment in a small open economy



In the simple world described by Figure 4.1, it is clear that taxes on investment such as a source-based corporation tax will discourage domestic investment and reduce capital imports whereas they will have no impact on domestic saving. By contrast, taxes on saving such as the residence-based personal capital income tax will lead to lower domestic savings and increased capital imports but will not affect domestic investment.[11] If policy makers wish to stimulate domestic real investment, they should thus concentrate on lowering domestic source-based taxes on investment. On the other hand, if the policy aim is to stimulate total wealth accumulation, the government should focus on lowering taxes on saving.

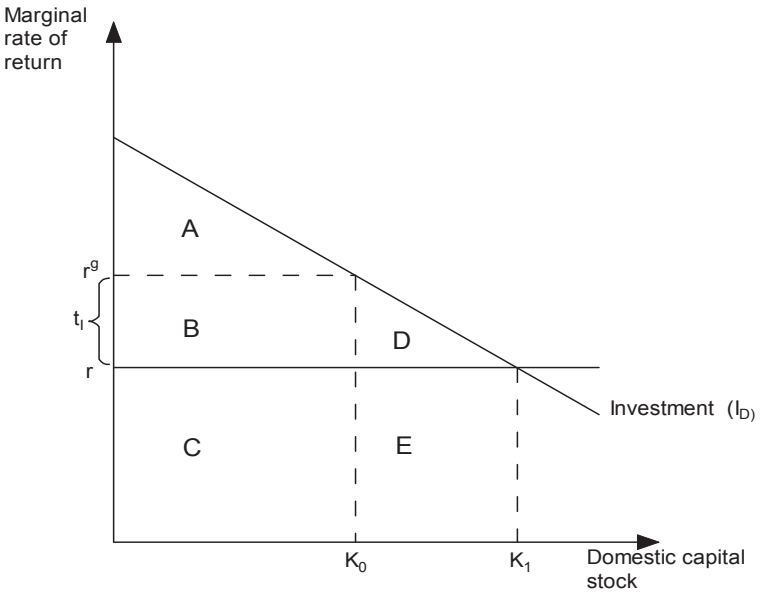
Building on the above analysis, we may now use Figure 4.2 to illustrate that the deadweight loss from a source-based capital tax like the corporation tax will be larger than the *DWL* from the labour income tax in a small open economy whenever the initial (effective) capital tax rate is positive.[12] Along the horizontal axis in Figure 4.2 we measure the total stock of capital invested in the domestic economy by domestic and foreign investors. The *I* -curve

[11] This analysis is somewhat simplified. In practice savings and investment will not be completely decoupled from each other. For example, via its impact on real wages a tax on investment may cause a change in labour supply which will generate a shift in the *S*-curve as well as the *I*-curve in Figure 4.1. Our estimates of deadweight loss will account for such interactions among tax bases.
[12] The analysis in Figure 4.2 is inspired by Benge (1999).

shows how the marginal pre-tax rate of return to capital (capital's marginal product) declines as the stock of capital increases. Since capital will tend to more productive the greater the pool of labour with which it is combined, the position of the I -curve will depend on the existing level of employment. The horizontal r-curve shows the return capital owners can obtain by investing elsewhere in the world, net of any source-based taxes that foreign governments may choose to impose. If the domestic government levies the source-based tax t_I on domestic investment, the marginal pre-tax rate of return on such investment will thus have to equal r^g to ensure that domestic investment earns an after-tax return that matches the net return obtainable in other countries. Hence the domestic capital stock will be taken to the level K_0 in Figure 4.2. Since the I-curve indicates the rise in total output generated by each additional unit of capital, the total area under the curve measures total domestic GDP. With an investment tax t_I, domestic GDP will thus be equal to the area A+B+C. The rectangle C measures the net income accruing to the suppliers of capital to the domestic economy, and the rectangle B is the government's capital tax revenue. The triangle A therefore measures that part of total income which accrues to domestic labour (which is taken to be the only other factor of production).

Suppose now that the government abolishes the source-based capital tax t_I. The level of domestic investment will then go up, causing an increase in the demand for labour which will drive up the domestic real wage. It will then be possible for the government to raise the labour income tax without reducing disposable real wages. Suppose therefore that the government adjusts the tax schedule for labour income in a way that keeps the marginal after-tax wage rate and the total disposable income of workers constant. In that case the supply of labour will be unchanged, so total after-tax labour income will still be equal to area A. With an unchanged level of employment, the I-curve in Figure 4.2 also remains in the same position as before, but because of the removal of the capital tax, the domestic capital stock increases to the level K_1, so total pre-tax labour income becomes equal to A+B+D. Hence the revenue from the labour income tax must be B+D. By abolishing the capital tax and giving up the capital tax revenue B, the government can thus raise the revenue B+D from the labour income tax without making domestic workers worse off than before.

Figure 4.2 The effects of a source-based capital tax in a small open economy



Since domestic savers still receive an after-tax return equal to r on their savings, it follows that they will likewise be just as well off as before. In other words, replacing a source-based capital tax with a higher labour income tax enables the government to raise the additional revenue D without reducing the welfare of the private sector.

If we compare an increase in the labour income tax to an increase in the corporation tax that has the same effect on private sector welfare – so that the value of ΔE in equation (1) is the same in the two policy experiments – it follows from the above analysis that the revenue increase ΔR in (1) will be higher when the revenue is raised through the labour income tax. Hence the marginal deadweight loss from the labour income tax is lower than the marginal *DWL* from a source-based business income tax like the corporation tax (given our assumption that the initial source-based capital tax is positive).

To understand this result, note that under perfect capital mobility the burden of a source-based capital tax levied by a small open economy is fully shifted onto the less mobile domestic factors of production, i.e., labour in our case. Since the source tax

falls only on domestic investment, investors can escape the burden of the tax by moving their capital abroad, so capital will flow out of the domestic economy until the pre-tax return on domestic investment has risen by the full amount of the tax. This results in a capital shallowing of the economy, which lowers the productivity of labour and forces workers to accept a lower real wage to remain employed. In this way the burden of the source-based capital tax is shifted to labour. The drop in real wages will tend to reduce domestic labour supply, but as long as the elasticity of labour supply is finite and capital is perfectly mobile (and hence in perfectly elastic supply), the burden of the source-based capital tax must in the end be shouldered by labour. Of course, a rise in the labour income tax also implies a lower net real wage which reduces labour supply, but it avoids the disincentive for investment (and the resulting capital outflow) stemming from the higher tax on domestic investment. Because it generates a larger drop in investment, a source-based capital tax creates a greater dynamic revenue loss and hence a larger marginal deadweight loss than the labour income tax.

The theoretical analysis above implies at least two testable predictions. The first one is that the imposition of a source-based capital tax induces a capital outflow. The second prediction is that – in the long run when the capital stock has had sufficient time to adjust – the burden of a source-based capital tax is shifted onto workers through lower wage rates. There is substantial empirical evidence supporting both of these hypotheses. For example, in their comprehensive survey of a wealth of empirical studies, de Mooij and Ederveen (2008) conclude that the typical semi-elasticity of foreign direct investment (FDI) with respect to the effective marginal corporate tax rate is around -4.0, meaning that a one percentage point increase in the effective tax rate causes a four percent drop in the stock of inbound FDI. If the share of the total domestic capital stock owned by foreigners is, say, 30 percent, such a drop in FDI would imply a 1.2 percent fall in the total capital stock, and hence a drop in GDP of around 0.4 percent, on the common assumption that the elasticity of total output with respect to the capital stock is about one third.[13]

[13] With competitive markets the capital income share in GDP will equal the elasticity of output with respect to capital. In most OECD countries the observed capital income share is around one third.

Recent empirical work using cross-country data on corporate taxes and wages also provides mounting evidence that the corporate income tax is shifted onto workers to a very high degree. For example, Hassett and Mathur (2006) find that a 1 percent increase in the corporate tax rate is associated with nearly a one percent drop in wage rates, and Felix (2007) estimates that a ten percentage point increase in the corporate tax rate decreases annual gross wages by seven percent. Moreover, the central estimate of Arulampalam, Devereux, and Maffini (2007) suggests that 61 percent of any additional corporate tax is passed on in lower wages in the short run and around 100 percent in the long run. These econometric findings are broadly in line with the analysis of Harberger (2006) who uses a computable general equilibrium model to estimate that domestic labour bears around 95 percent of the overall burden of the corporation tax.[14]

Despite the supporting empirical evidence just mentioned, the theoretical analysis above invites one obvious objection: if source-based taxes on capital are fully shifted onto workers and generate a larger deadweight loss than the labour income tax, why do governments persist in collecting such taxes like the corporation tax? Part of the answer lies in the important distinction between taxes on the normal return to capital and taxes on rents, that is, pure profits in excess of the going market rate of return on capital. The analysis above applies only to taxes on the normal return. If investors can earn so-called location-specific rents by investing in a particular country, the government can levy a source-based capital tax without inducing a capital flight. Natural resources are perhaps the most obvious factor giving rise to location-specific rents, but such rents may also stem from a good local infrastructure, an efficient public administration, a well-educated and flexible work force, and from so-called agglomeration forces whereby a concentration of business firms in a given location generate cost savings and various positive spillover effects from one firm to another (see Sørensen, 2007a, pp. 184-86). In Chapter 8 we shall discuss how the Swedish corporation tax might be reformed so as to exempt the normal return from tax while still performing the important function of taxing rents.

As a background for this discussion, the next main section will present estimates of the marginal deadweight loss from the labour

[14] Gentry (2007) provides a good overview and discussion of these and related studies on the incidence of the corporate income tax.

income tax and from the corporation tax on the normal return as well as the marginal deadweight losses from taxes on saving and consumption in Sweden.

4.2 Estimating the marginal deadweight loss from taxation in Sweden

General assumptions

To estimate deadweight losses one needs a theory of how economic behaviour is influenced by taxation. The economic model underlying our estimates is specified in detail in Sørensen (2010). The model describes a long-run equilibrium in a small open economy where capital is perfectly mobile across borders whereas labour is imperfectly mobile.[15] With perfect capital mobility, the domestic equilibrium real interest rate is determined in the world capital market. Production requires inputs of capital and labour and households are assumed to optimise their labour supply and to smooth their consumption over time in accordance with the life cycle theory of consumption. The savings undertaken by households during working age help to finance their consumption after they have retired. The remaining part of consumption during retirement is financed by public pensions. Households also receive some tax-financed transfers during working age. The taxes considered are a progressive labour income tax, a proportional indirect tax on consumption, a proportional residence-based capital income tax on the return to domestic savings, and a proportional source-based business income tax on domestic investment (mainly the corporate income tax).

In this framework both labour supply and savings depend on the after-tax real wage and the after-tax real interest rate as well as on government transfers, and aggregate business investment depends on the international real interest rate, on domestic source-based taxes on capital, and on domestic labour supply (since the latter influences real wages and thereby the profitability of investment).

[15] The model does not explicitly incorporate migration flows across borders, but it allows for an elastic supply of labour where the variation in labour supply could stem partly from changes in immigration in response to changes in the domestic after-tax real wage.

When calculating the deadweight losses from the various taxes in a life cycle setting, one must account for the fact that, on average, capital income taxes on saving are collected at a later stage in the individual taxpayer's life cycle than the labour income taxes he pays, since his financial wealth only gradually accumulates during his working career. Our deadweight loss formulas therefore discount the revenue from capital income taxes relative to the revenue from labour income taxes, since our variables ΔR^s and ΔR^d in (3) are intended to capture the change in the *present value* of the taxes paid over the life cycle of a representative cohort of taxpayers. This procedure ensures that our deadweight loss measures do reflect pure efficiency effects rather than revenue changes that serve to redistribute income across generations.[16]

The marginal deadweight loss from taxes on labour income

When analysing the marginal deadweight loss from the taxation of labour income, we will consider the effect of an identical increase in the marginal tax rates of all workers. Note that only the tax rate on labour income is assumed to be changed, whereas after-tax public transfers are kept constant. Box 4.1 displays the formula for the marginal deadweight loss from such a policy experiment, given the assumptions outlined above. We see that the deadweight loss includes four components, representing the effects of behavioural responses on the four major tax bases. First, the higher marginal tax rate on labour income reduces labour supply, thereby reducing the revenue from the labour income tax. Second, because the drop in labour supply reduces disposable income, it also reduces consumption, causing a fall in the revenue from consumption taxes. Third, the lower labour supply generates an upward pressure on real wages that tends to reduce the profitability of business investment. The resulting drop in investment leads to lower business income, thus eroding the revenue from business income taxes. Fourth, the fall in labour income implied by the drop in

[16] Technical note: when the capital income tax rate is raised, there is of course an immediate impact on public revenue, but this revenue gain is exactly offset by the amount needed to compensate the current generation of retirees for the unexpected increase in the taxation of existing wealth. Since our deadweight loss formulas assume that taxpayers are compensated, the net revenue gain from a higher capital income tax does not start to accrue until members of the current young generation start to pay the higher savings tax. See Sørensen (2010) for details.

labour supply reduces savings so that the (present value of the) revenue from savings taxes decline.

To apply formula (B.2) in Box 4.1, we need to insert realistic values of the various tax rates and ratios of business income and savings income to the aggregate wage bill. As documented in Sørensen (2010, Appendix C), plausible parameter values based on the situation prevailing in Sweden in 2008 would be as follows:

Average value of the marginal direct tax rate on gross labour income, including social security taxes paid by employers and employees (t^w): 47.6%
Average effective indirect tax rate on consumption, measured relative to the consumer price (t^c): 24.9%
Average value of the marginal effective tax rate on business income (m^k): 7.6%
Average value of the marginal effective tax rate on the real return to financial saving (t^r): 31.5%
Ratio of business income to total wage bill (θ^k): 13.9%
Ratio of savings income to total wage bill (θ^s): 17.0%
Public transfers to individuals of working age relative to total wage bill (b_1): 22.7%

The effective indirect tax rate on consumption (t^c) is a weighted average tax rate across all the different goods and services. It includes the VAT, excise taxes and the various taxes on housing such as property taxes, capital gains taxes and stamp duties.[17] The marginal effective tax rate on savings income (t^r) is a weighted average of the ordinary personal capital income tax rate and the tax on the imputed return to savings channelled through pension funds and life insurance companies. The estimated effective tax rates on the real return to savings account for the fact that taxes are levied on the full nominal rate of return. The estimates assume a real pre-

[17] While the purchase of a house or an apartment should be seen as an investment, the return to that investment primarily takes the form of the value of the housing service accruing to the owner. Since the consumption of housing services is part of total private consumption, this report classifies property taxes, stamp duties and taxes on capital gains on residential property as consumption taxes. Chapter 5 explains in detail how one may measure the effective tax rate on housing consumption. It also explains how a non-neutral taxation of housing relative to other forms of consumption will distort the incentive to invest in residential property as compared to investment in financial assets.

tax rate of return of 5 percent per annum and an annual inflation rate of 2 percent.[18]

Box 4.1 The marginal deadweight loss from higher taxes on labour

We wish to consider the effect of an identical increase in the marginal tax rates of all taxpayers. For this purpose we may approximate the tax-transfer schedule faced by the working population by the linear tax schedule

$$T = t^w WL - B_1, \qquad 0 < t^w < 1, \qquad B_1 > 0, \tag{B.1}$$

where W is the real producer wage rate (the employer's real labour cost), t^w is the effective marginal tax rate on labour income (including social security taxes as well as personal income tax), and B_1 is a lump-sum transfer to people of working age. Note that although the marginal tax rate is constant, (B.1) implies that taxation is progressive in the sense that the average tax rate $T/WL = t^w - B_1/WL$ is increasing in total labour income WL. In the empirical application of the model t^w is estimated as a weighted average of the effective marginal labour income tax rates across all taxpayers.

From the life cycle model described in the main text above, Sørensen (2010, section 4.2) shows that the degree of self-financing associated with a small change in the (average value of) the marginal labour income tax rate is given by the following expression which decomposes the total deadweight loss into the losses stemming from the changes in each of the four major tax bases:

$$DSF_{t^w} = \overbrace{\left(\frac{t^w \varepsilon_w^L}{1-t^w}\right)}^{\text{loss of labour income tax revenue}} + \overbrace{\left(\frac{t^c\left(1-t^w\right)\varepsilon_w^L}{1-t^w}\right)}^{\text{loss of consumption tax revenue}} + \overbrace{\left(\frac{m^k\theta^k\varepsilon_w^L}{1-t^w}\right)}^{\text{loss of business income tax revenue}} + \overbrace{\left(\frac{pt^r\theta^s\varepsilon_w^S}{1-t^w}\right)}^{\text{loss of savings tax revenue}}, \qquad p \equiv \frac{1}{1+r\left(1-t^r\right)}. \tag{B.2}$$

[18] In the remainder of this report, the 5 percent real rate of return will often be referred to as "the real interest rate", but it should be thought of as the average real rate of return to financial saving which is a weighted average of the return on interest-bearing assets and the long-run return on shares. The fact that the rates of return on these assets include a risk premium explains why we have chosen a rather high value for "the real interest rate".

Box 4.1 cont.
Here t^c is the effective ad valorem tax rate on consumption (measured as a fraction of the consumer price), m^k is the marginal effective tax rate on business investment, t^r is the marginal effective tax rate on the real return to financial saving, r is the real interest rate before tax, θ^k is the ratio of business profits to the aggregate wage bill, θ^s is the ratio of savings income to the aggregate wage bill, ε_w^L is the compensated elasticity of labour supply with respect to the marginal after-tax real wage, and ε_w^S is the compensated elasticity of savings with respect to the marginal after-tax real wage (for an exact mathematical specification of all of these variables, see Sørensen (2010)).

Sørensen also shows that if the marginal savings rate equals the average savings rate, the two compensated elasticities appearing in (B.2) are linked by the relationship

$$\varepsilon_w^S = \left(\frac{1-t^w}{1-t^w+b_1} \right) \varepsilon_w^L, \qquad \text{(B.3)}$$

where b_1 measures public transfers to people of working age relative to the aggregate wage bill. This relationship can be used to estimate the size of ε_w^S on which there is relatively little evidence, compared to the evidence on ε_w^L.

The marginal effective tax rate on business income (m^k) is a weighted average of the estimated marginal effective tax rates on equity-financed and debt-financed investment. The estimated effective tax rate of 7.6 percent is quite low compared to the statutory corporate income tax rate of 26.3 percent. The reason is that 40 percent of the investment expenditure is assumed to be financed by debt (in line with the assumption made by several previous studies of corporate income taxation in Sweden, including Öberg (2003)), so part of the profits from corporate investment are shielded from tax through the deductibility of interest payments. In particular, the tax code allows full deductibility of nominal interest expenses, including the inflation premium in the nominal interest rate which does not reduce real profits since it is offset by the erosion of the real debt burden caused by inflation.

Because of the tax-favoured status of debt finance, taxable business profits are smaller than the true economic business income, and hence the effective tax rate on the latter is much lower than the statutory tax rate.

To apply formula (B.2) in Box 4.1, we also need to make assumptions on the elasticities of labour supply and savings with respect to the (marginal) after-tax real wage. Because of the link between these two elasticities stated in formula (B.3), we actually only need information on the labour supply elasticity (ε_w^L). It is important to keep in mind that this elasticity should be interpreted broadly since it captures all types of behavioural responses affecting the labour income tax base. These responses include changes in labour force participation, changes in hours worked by those already employed, changes in labour productivity stemming from changes in work effort, education and training, shifts between remuneration in fully taxed cash wages and lightly taxed or untaxed fringe benefits, shifts between market work and do-it-yourself activities in the home, shifts between the untaxed "underground economy" and the formal labour market, etc. Changes in all these dimensions of labour supply will affect the labour income tax base and are captured by the so-called elasticity of taxable labour income which measures the response of the labour income tax base to a change in the marginal after-tax rate, defined as one minus the effective marginal labour income tax rate ($1-t^w$ in our notation). Because it includes all the behavioural responses mentioned above, the elasticity of taxable income is likely to be larger than the conventional elasticity of hours worked on which many earlier studies have focused.

Recent empirical studies of the elasticity of taxable labour income in Sweden include Hansson (2007), Holmlund and Söderström (2007), Ljunge and Ragan (2008), and Blomquist and Selin (2009). The estimated elasticities in these studies generally vary from 0.2 to 0.5 (for women, Blomquist and Selin actually estimate elasticities of 1.0-1.4). These estimates are uncompensated elasticities including income effects as well as substitution effects on the tax base. Since the income effect must be assumed to be negative (e.g., when income goes up, the demand for leisure will tend to increase, thereby reducing labour supply), the estimates mentioned above must be seen as lower bounds on the compensated elasticity which is relevant when calculating the deadweight loss (see footnote 2). In our baseline estimates, we will

assume that $\varepsilon_w^L = 0.2$. As the above discussion suggests, this is a rather conservative assumption on the magnitude of the elasticity of taxable income in Sweden, so in our sensitivity analysis presented later in this chapter we will also explore the implications of assuming a higher elasticity. According to formula (B.3) in Box 4.1 plus the estimated values of t^w and b_1 mentioned earlier, the assumption that $\varepsilon_w^L = 0.2$ implies that the compensated elasticity of savings with respect to the after-tax real wage (ε_w^S) is 0.14.

Finally, when applying formula (B.3) we must calibrate the discount factor p appearing in the last term. This discount factor depends on the after-tax real interest rate and on the average time distance between the representative household's earnings of labour income and savings income. Our baseline estimates assume that, on average, a krona of labour income is earned 25 years earlier in the life cycle than a krona of savings income. As we shall see later, most of our results are rather insensitive to changes in the assumption regarding this time distance.

When all the above parameter values are plugged into formula (B.2), we find that

$$DSF_{t^w} = \overbrace{0.182}^{\text{loss of labour income tax revenue}} + \overbrace{0.05}^{\text{loss of consumption tax revenue}} + \overbrace{0.004}^{\text{loss of business income tax revenue}} + \overbrace{0.006}^{\text{loss of savings tax revenue}} = 0.242 \qquad (4)$$

According to this estimate, about 24 percent of the initial revenue gain from a (small) increase in the marginal tax rate on all labour income will be lost again due to the negative reaction of tax bases to the higher tax rate. Equivalently, if the marginal tax rate on all labour income is cut a bit, 24 percent of the initial revenue loss will be recouped via the positive response of the various tax bases.

As indicated in (4), most of the estimated deadweight loss from a higher marginal tax rate on labour income stems from the shrinking of the labour income tax base itself, but a substantial part also reflects a shrinking of the consumption tax base. Losses of revenue from business income taxes and savings income taxes only account for a minor part of the deadweight loss. In part this reflects that these tax bases are relatively small and that the effective marginal tax rate on business income is so low that little business tax revenue is lost when business investment goes down due to the fall in labour supply. The small revenue loss from taxes

on savings income also reflects that these losses are discounted since they are assumed to occur 25 years into the future (on average).

In summary, for plausible parameter values, including a relatively conservative assumption on the elasticity of the labour income tax base, it appears that the deadweight loss associated with higher marginal tax rates on labour income amounts to roughly one quarter of the initial static revenue gain. It is important to keep in mind that this estimate refers to an across-the-board change in the marginal tax rate for all workers. As we shall see in Chapter 6, the deadweight loss associated with a rise in the marginal tax rate for top income earners is likely to be much higher than the estimate presented above.

The marginal deadweight loss from consumption taxes

Taxes on consumption such as the VAT and the excises are typically passed on to consumer prices. In this way they erode the purchasing power of nominal wages, just as social security taxes and the personal income tax cut into net wages. In principle it does not matter for a worker whether his purchasing power is curbed in one way or the other, so consumption taxes may be seen as taxes on labour income, with the same negative effect on labour supply.[19] However, consumption taxes are also paid by individuals outside the labour force, so the consumption tax base is broader than the labour income tax base. By eroding the purchasing power of existing financial wealth, a rise in the consumption tax rate works in part like a capital levy on savings accumulated in the past which are pre-determined by history and hence do not react negatively to a higher tax rate. Moreover, unlike a rise in the labour income tax rate, a higher consumption tax rate does not reduce the relative income gain experienced by a person who moves from non-employment into employment, since the higher consumption tax erodes the real value of transfers as well as the purchasing power of wages. For these reasons the consumption tax base is less elastic than the labour income tax base, and a higher consumption tax does not weaken work incentives to the same degree as a higher labour income tax. As a consequence, the marginal deadweight loss

[19] Selective consumption taxes like excise duties also affect the pattern of consumption. The resulting deadweight losses will be studied in Chapter 5.

from higher consumption taxes is smaller than the marginal deadweight loss generated by higher labour income taxes, as demonstrated in Box 4.2.

Box 4.2 The marginal deadweight loss from a rise in the consumption tax rate

As shown by Sørensen (2010, section 4.3), the degree of self-financing associated with a small change in the average effective indirect tax rate on consumption is given by the following expression:

$$DSF_{t^c} = \left(\frac{1-t^w}{1-t^w+b_1+pb_2} \right) DSF_{t^w}, \qquad \text{(B.4)}$$

where b_2 measures total public transfers to retirees relative to the aggregate wage bill, and where DSF_{t^w} is the degree of self-financing associated with labour income taxes stated in formula (B.2). Formula (B.4) shows that the marginal deadweight loss from consumption taxes will always be smaller than the loss from labour income taxes, because of the appearance of the terms b_1 and b_2 in the denominator of (B.4). These terms represent the public transfers that constitute the inelastic part of the consumption tax base.

In Sweden public after-tax transfers to people above working age amounted to 8.6 percent of the total wage bill in 2008 while individuals of working age received net transfers amounting to 22.7 percent of the wage bill. Plugging these values of b_2 and b_1 into formula (B.4) in Box 4.2 along with the parameter values reported earlier, we obtain the following estimate of the marginal deadweight loss created by a small rise in the average indirect tax rate on consumption:

$$DSF_{t^c} = \overbrace{0.121}^{\substack{\text{loss of labour} \\ \text{income tax revenue}}} + \overbrace{0.033}^{\substack{\text{loss of consumption} \\ \text{tax revenue}}} + \overbrace{0.003}^{\substack{\text{loss of business} \\ \text{income tax revenue}}} + \overbrace{0.004}^{\substack{\text{loss of savings} \\ \text{tax revenue}}} = 0.161 \qquad (5)$$

The numbers in (5) are simply two thirds of the corresponding numbers in (4), reflecting the size of the proportionality factor $\left(1-t^w\right)/\left(1-t^w+b_1+pb_2\right)$ in formula (B.4). The smaller deadweight

loss in (5) reflects that consumption taxes work partly like a labour income tax and partly like a lump sum tax on the inelastic part of the consumption tax base represented by the public transfers mentioned above.

As our analysis makes clear, taxes on consumption are less distortionary than taxes on labour income because consumption taxes also fall on people outside the labour market. The smaller deadweight loss from consumption taxes is thus obtained via a cut in the living standard of benefit recipients. If such a cut is deemed politically unacceptable for distributional reasons, it may be avoided by indexing benefit rates to consumer prices so that transfer recipients are compensated for higher indirect taxes through a rise in nominal benefits. In that case a higher consumption tax rate will in principle work like a proportional labour income tax, generating the same deadweight loss.

The marginal deadweight loss from higher taxes on business income

Consider next the effects of a rise in the source-based tax on business income, that is, a rise in the tax on domestic investment. In practice this could be implemented through a rise in the statutory corporate income tax rate or via measures to broaden the business income tax base such as a cut in depreciation allowances.

The marginal deadweight loss from such a policy change is given by formula (B.5) in Box 4.3. This expression is identical to the formula for the marginal deadweight loss associated with the labour income tax except for the additional term $m^k \left(\frac{c}{c+\delta}\right)\varepsilon_\rho^K \Big/ \left(1-t^w\right)$, where c is the required real pre-tax rate of return on the marginal investment (the cost of capital), δ is the average real rate of depreciation of business assets, and ε_ρ^K is the numerical elasticity of capital demand with respect to the user cost of capital (with the user cost being defined as $c+\delta$). Since this additional term has the same sign as m^k , it follows that the marginal deadweight loss from a higher tax on investment is larger than the loss from a higher labour income tax whenever the initial marginal effective tax rate on investment is positive. The explanation for this important result was given in section 4.1 where we saw that the burden of a source-based capital tax is shifted onto workers via a fall in real wages generated by the drop in investment. In this way the investment tax reduces labour supply just like a

labour income tax. But the investment tax creates an additional capital outflow that further reduces the business income tax base. The resulting effect on business tax revenue is captured by the term $m^k\left(\frac{c}{c+\delta}\right)\varepsilon_\rho^K \Big/ \left(1-t^w\right)$ in (B.5). The magnitude of the additional capital outflow depends on the capital demand elasticity ε_ρ^K. In their survey of empirical studies of the effects of tax policy on investment, Hassett and Hubbard (2002) conclude that the numerical user cost elasticity of capital demand (ε_ρ^K) is probably between 0.5 and 1.0. Here we follow Auerbach and Kotlikoff (1987) in assuming that $\varepsilon_\rho^K = 1$, since this can be shown to be consistent with the empirical observation that the aggregate gross profit share of GDP is relatively constant over the long run.

Box 4.3 The marginal deadweight loss from a source-based business income tax

According to the analysis in Sørensen (2010, section 4.4), the marginal deadweight loss from a source-based business income tax in a small open economy can be expressed in the following manner:

$$DSF_{t^k} = \overbrace{\left(\frac{t^w \varepsilon_w^L}{1-t^w}\right)}^{\text{loss of labour income tax revenue}} + \overbrace{\left(\frac{t^c\left(1-t^w\right)\varepsilon_w^L}{1-t^w}\right)}^{\text{loss of consumption tax revenue}} + \overbrace{\left(\frac{m^k\left(\frac{c}{c+\delta}\cdot\varepsilon_\rho^K + \theta^k \varepsilon_w^L\right)}{1-t^w}\right)}^{\text{loss of business income tax revenue}} + \overbrace{\left(\frac{pt^r\theta^s\varepsilon_w^S}{1-t^w}\right)}^{\text{loss of savings tax revenue}} \quad \text{(B.5)}$$

$$= DSF_{t^w} + \frac{m^k\left(\frac{c}{c+\delta}\right)\varepsilon_\rho^K}{1-t^w}.$$

The parameter ε_ρ^K is the numerical elasticity of capital demand with respect to the user cost of capital, c is the real pre-tax rate of return required on a marginal investment that is just barely worth undertaking, δ is the average real rate of depreciation of business assets, and DSF_{t^w} is the marginal deadweight loss from the labour income tax specified in (B.2) in Box 4.1. From (B.5) we see that when the initial marginal effective tax rate on investment (m^k) is positive, a source-based capital tax generates a larger marginal deadweight loss than the labour income tax, as economic theory predicts.

Given the plausible values of c and δ documented in Sørensen (2010, Appendix C), we can now use formula (B.5) to produce the following estimate of the marginal deadweight loss from a higher source-based business income tax:

$$DSF_{t^k} = \overbrace{0.182}^{\text{loss of labour income tax revenue}} + \overbrace{0.05}^{\text{loss of consumption tax revenue}} + \overbrace{0.058}^{\text{loss of business income tax revenue}} + \overbrace{0.006}^{\text{loss of savings tax revenue}} = 0.296 \qquad (6)$$

Comparing equations (4) and (6), we see that a business income tax like the corporation tax generates a marginal deadweight loss which is about 5½ percentage points higher than the marginal deadweight loss from a higher labour income tax. As mentioned, this additional deadweight loss arises because the source-based corporate income tax has a larger negative impact on the business income tax base. It is remarkable that the marginal deadweight loss from the corporation tax exceeds the marginal deadweight loss from the labour income tax by almost one fourth, despite the fact that the initial marginal effective tax rate on business income is estimated to be quite low, i.e., only about 7.6 percent. However, it should be kept in mind that the large additional efficiency loss from a source-based business income tax relates to a tax on the "normal" return to investment. A tax that is levied only on above-normal returns would have a lower efficiency cost, as we shall discuss in detail in Chapter 7.

The marginal deadweight loss from a higher tax on financial savings

Let us finally consider the effects of a (small) rise in the effective tax rate on the real return to financial saving, and let us assume that the tax increase applies equally to interest income and to income from shares (dividends and capital gains). In that case there is no change in the incentive to invest in shares rather than bonds and bank deposits, so the cost of equity finance for closely held firms without access to the international equity market will be unaffected. However, since the higher tax falls on all returns to savings, including savings invested abroad,[20] the real after-tax return to saving will drop.

[20] This statement assumes that the domestic tax authorities can enforce the residence principle under which taxpayers are liable to tax on their worldwide income.

Our measure of deadweight loss involves a thought experiment in which the taxpayer is compensated for the tax increase through a lump-sum transfer from the government that is paid out in the same time period in which the higher tax has to be paid. This compensation eliminates the so-called income effect of the tax increase that would otherwise have tended to increase savings, since the lower net return to saving means that taxpayers would have had to forego a larger amount of current consumption to ensure a given amount of future consumption if they had not received a higher future transfer from the government. In the absence of an income effect, a lower net return to saving can be shown to reduce the amount of saving (see Sørensen, 2010, Appendix B).

Box 4.4 The marginal deadweight loss from a residence-based savings income tax

Let t^r denote the marginal effective tax rate on the real rate of return to financial savings, including savings channelled through institutional investors such as pension funds and life insurance companies (in Chapter 7 we shall explain how this effective tax rate may be estimated). The real after-tax return to financial savings, denoted r^a, is then given by

$$r^a = r\left(1 - t^r\right) \tag{B.6}$$

where we recall that r is the real pre-tax rate of return to financial saving which is determined in the international capital market. Given the definition in (B.6) and the notation introduced in the previous boxes, Sørensen (2010, section 4.5) shows that the present value of the marginal deadweight loss associated with a small increase in t^r can be decomposed as follows:

Box 4.4 cont.

$$DSF_{t^r} = \overbrace{\left(\frac{t^w \varepsilon_r^L}{\left(1-t^r\right)\left(\theta^s + rpb_2\right)/\left(1+r^a\right)}\right)}^{\text{loss of labour income tax revenue}} + \overbrace{\left(\frac{t^c\left(1-t^w\right)\varepsilon_r^L}{\left(1-t^r\right)\left(\theta^s + rpb_2\right)/\left(1+r^a\right)}\right)}^{\text{loss of consumption tax revenue}} \qquad \text{(B.7)}$$

$$+ \overbrace{\left(\frac{\theta^k m^k \varepsilon_r^L}{\left(1-t^r\right)\left(\theta^s + rpb_2\right)/\left(1+r^a\right)}\right)}^{\text{loss of business income tax revenue}} + \overbrace{\left(\frac{t^r \theta^s \varepsilon_r^S/\left(1+r^a\right)}{\left(1-t^r\right)\left(\theta^s + rpb_2\right)/\left(1+r^a\right)}\right)}^{\text{loss of savings tax revenue}}.$$

The parameters ε_r^L and ε_r^S are, respectively, the compensated elasticities of labour supply and savings with respect to the real after-tax interest rate, and b_2 is the amount of after-tax public transfers (primarily pensions) to retirees, measured relative to the total wage bill. The term $\left(\theta^s + rpb_2\right)/\left(1+r^a\right)$ in the denominators in (B.7) is the present value of the static revenue gain from an increase in t^r. Note that the revenue gain is discounted by $\left(1+r^a\right)$ because the capital income tax is paid at a late stage in the life cycle of the representative taxpayer, after he/she has accumulated savings during his/her working career.

The fall in savings following a (compensated) increase in the taxation of savings income reduces the capital income tax base, thereby generating a dynamic revenue loss and an associated deadweight loss. This effect is captured by the last term in equation (B.7) in Box 4.4.

But a (compensated) fall in the after-tax interest rate will also tend to reduce the supply of labour, as shown by equation (B.8) in Box 4.5. The intuition is that, by reducing the net return to savings made out of labour income, a lower net return to saving makes working less attractive. As we have seen earlier, a drop in labour supply will not only reduce the revenue from taxes on labour income, but also the revenue from taxes on consumption and business income. The resulting deadweight losses are reflected in the first three terms in equation (B.7) in Box 4.4.

Box 4.5 The interest elasticities of labour supply and savings

To apply formula (B.7) one needs to make an assumption regarding the size of the compensated interest elasticity of labour supply (ε_r^L) about which relatively little is known. However, as shown by Sørensen (2010, Appendix B), the standard life cycle model of consumption and labour supply implies that the compensated elasticities of labour supply with respect to the net interest rate and the net wage rate are linked by the relationship

$$\varepsilon_r^L = s \cdot \left(\frac{r^a}{1+r^a} \right) \cdot \varepsilon_w^L, \qquad \text{(B.8)}$$

where s is the net savings rate of the representative taxpayer during his/her working career. This relationship allows us to calibrate a plausible value of the interest elasticity of labour supply, given a realistic assumption on the wage elasticity of labour supply, ε_w^L.

Sørensen (op.cit.) also shows that, when consumers are compensated for a higher savings tax rate via a rise in retirement pensions, the life cycle model implies the following link between the compensated elasticity of savings with respect to the net interest rate (ε_r^S) and the corresponding uncompensated net interest elasticity of savings ($\hat{\varepsilon}_r^S$):

$$\varepsilon_r^S = \hat{\varepsilon}_r^S + \left(\frac{r^a}{1+r^a} \right)(1+b)\left(1-c_Y \varepsilon_Y^C\right). \qquad \text{(B.9)}$$

The fraction b is the amount of consumption during retirement which is financed by public pensions, measured relative to consumption financed by previous savings; c_Y is the fraction of potential lifetime income which is spent on consumption during retirement, and ε_Y^C is the income elasticity of demand for consumption during retirement. Equation (B.9) allows a calibration of the compensated interest elasticity of savings based on plausible values of the parameters on the right-hand side.

Given our earlier assumption that the average time distance between the earning of labour income and capital income is 25 years in the representative taxpayer's life cycle, and assuming an average savings rate of 20 percent during the working career, formula (B.8) in Box 4.5 implies a modest compensated net interest elasticity of labour supply of about 0.023 when the net wage elasticity of labour supply is 0.2.[21] Although it varies considerably in the short and medium term, the household savings rate tends to be roughly constant in the long run, despite the fact that the after-tax real interest rate has varied over time due to changes in the tax law. This suggests that the long-run uncompensated interest elasticity of savings (the parameter $\hat{\varepsilon}_r^S$ in equation (B.9)) is approximately zero. As a benchmark assumption we will therefore assume that $\hat{\varepsilon}_r^S = 0$. This assumption is supported by the early empirical studies by Blinder (1975), Howrey and Hymans (1978) and Skinner and Feenberg (1989) who estimated the uncompensated interest elastiticy of saving in the United States to be essentially zero. In Sweden the parameter b is around 0.25, and plausible values of the parameters c_Y and ε_Y^C in (B.9) could be 0.2 and 1, respectively, as suggested by Sørensen (2010, Appendix C). From (B.9) our estimate of the compensated interest elasticity of savings then becomes roughly 0.57.

Inserting these elasticities etc. along with those used earlier into equation (B.7) in Box 4.4, we obtain the following estimate of the marginal deadweight loss from an increase in the effective marginal tax rate on savings income:

$$DSF_{t^r} = \overbrace{0.142}^{\substack{\text{loss of labour}\\ \text{income tax revenue}}} + \overbrace{0.039}^{\substack{\text{loss of consumption}\\ \text{tax revenue}}} + \overbrace{0.003}^{\substack{\text{loss of business}\\ \text{income tax revenue}}} + \overbrace{0.172}^{\substack{\text{loss of savings}\\ \text{tax revenue}}} = 0.356 \qquad (7)$$

The 35.6 percent marginal deadweight loss from a higher savings income tax is somewhat higher than the marginal deadweight losses from the other taxes considered earlier. The explanation is that, even though the uncompensated interest elasticity of saving was assumed to be zero, the *compensated* interest elasticity of saving (which is the relevant elasticity for the purpose of calculating the deadweight loss) is considerably higher than the compensated elasticities assumed for the other tax bases.

[21] We still interpret the net wage elasticity of "labour supply" broadly to include all behavioural responses of the labour income tax base to a change in the marginal net-of-tax rate (= one minus the marginal tax rate).

Despite the low interest elasticity of labour supply, we see from (7) that the dynamic losses of revenue from taxes on labour income and consumption contribute substantially to the total deadweight loss. The reason is that the deadweight loss is measured as the present value of the dynamic loss of revenue from the taxes paid by a representative cohort of taxpayers, relative to the present value of the static revenue gain from the higher tax imposed on this cohort. Because capital income is earned relatively late in life, the present value of the static revenue gain is heavily discounted. By contrast, taxes on labour income and consumption are paid already at an early stage in the life cycle. Even if the higher capital income tax only generates a small response in labour supply and consumption, the resulting revenue changes may therefore be substantial relative to the present value of the static revenue gain from the capital income tax that only accrues to the government far into the future.

Since it is difficult to estimate the average time distance between the earning of labour income and capital income during the life cycle, section 4.3 will investigate the sensitivity of the deadweight loss to changing assumptions regarding this time interval.

Comparing degrees of self-financing across different tax instruments

As we have explained, the marginal deadweight loss from an increase in some tax rate is identical to the degree of self-financing associated with a corresponding cut in that tax rate. Table 4.1 summarises the results of the analysis above by showing the degrees of self-financing for the four types of tax we have considered. In round numbers Table 4.1 says that a cut in consumption taxes will generate a dynamic revenue gain of about 15 percent of the initial static revenue loss. A cut in the average value of the effective marginal tax rate on labour income has a degree of self-financing of about 25 percent, while a cut in a source-based business income tax such as the corporation tax has a *DSF* close to 30 percent. Finally, the *DSF* generated by a cut in a residence-based savings income tax such as the personal capital income tax is roughly 35 percent. Regardless of the tax rate which is cut, a large part of the dynamic revenue gain stems from a higher labour income tax revenue, since the labour income tax base is relatively large, and especially since it is subject to a much higher initial marginal effective tax rate than the other tax bases.

Since a higher degree of self-financing is equivalent to a larger marginal deadweight loss, taxes with a higher *DSF* in Table 4.1 are more distortionary at the margin. The results in the table may be compared to the findings of a recent empirical study by the OECD secretariat (Johansson et alia, 2008). Using data for the OECD countries, this study suggests a clear ranking of taxes in terms of their (negative) impact on economic growth.[22] By this measure taxes on immovable property are less distortive than consumption taxes, and these are less distortive than personal income taxes which are in turn less damaging to growth than the corporation tax.

Table 4.1 Sweden: Degree of self-financing (DSF) associated with a tax rate cut (%)

Cut in effective marginal tax rate on	***Contribution to DSF from higher revenue from taxes on***				*Total DSF*
	Labour income	Consumption	Business income	Savings income	
Labour income (t^w)	18.2	4.8	0.4	0.6	24.0
Consumption (t^c)	12.1	3.2	0.3	0.4	16.0
Business income (t^k)	18.2	4.8	5.8	0.6	29.4
Savings income (t^r)	14.2	3.7	0.3	17.2	35.4

Assumptions: $\varepsilon_w^L = 0.2,\ \varepsilon_r^L = 0.023,\ \varepsilon_w^S = 0.14,\ \varepsilon_r^S = 0.568,\ \varepsilon_\rho^K = 1.0$, real interest rate = 5%, inflation rate = 2%.

Source: Own calculations based on Sørensen (2010).

When estimating the impact of personal income taxes, the OECD study does not separate the personal tax on labour income from the personal tax on capital income. Since labour income makes up the bulk of taxable personal income, the estimated effect of the personal income tax in the OECD study mainly captures the impact of the labour income tax. Hence the finding in Table 4.1 that a residence-based tax on savings income is more distortionary than a source-based business income tax is not necessarily inconsistent with the OECD study. Moreover, the predictions in Table 4.1 that consumption taxes generate a smaller loss of

[22] While our measure of deadweight loss captures the effect of taxes on the long-run *level* of a country's living standard, the OECD study measures the impact of taxes on the average rate of economic growth over a certain period. However, since it may take a long time for the economy to adjust fully to a new level of taxation, a tax policy change which only changes the level of income in the long run (but not the long-run growth rate) may have an impact on the average rate of economic growth over an extended period. It therefore makes sense to compare our estimates of the *DSF* to the OECD estimates of the impact of taxation on economic growth.

economic efficiency than taxes on labour income which in turn cause a smaller efficiency loss than the corporation tax are quite in line with the OECD study.

4.3 Sensitivity analysis

Our estimates of the degree of self-financing associated with tax cuts (= the marginal deadweight losses created by tax hikes) depend in part on economic variables for which data can be found in the national income accounts and partly on a number of elasticities etc. which can only be estimated with a considerably degree of uncertainty. This section considers the sensitivity of the *DSF* to variations in a number of key parameters.

The importance of the elasticity of the labour income tax base

The (compensated) elasticity of the labour income tax base with respect to the marginal after-tax real wage (ε_w^L) is such a key parameter. This elasticity appears directly in the formulas for the *DSF* associated with cuts in the marginal effective tax rates on labour income, business income and consumption, and it also influences the *DSF* for the effective marginal savings tax rate through the link between ε_w^L and the compensated interest elasticity of labour supply. As mentioned earlier, recent empirical studies based on Swedish data have typically estimated values of ε_w^L in the range from 0.2 to 0.4. Against this background, a value of ε_w^L equal to 0.1 seems very conservative, whereas a value equal to 0.4 seems more optimistic, but still a bit smaller than the preferred elasticity estimates in the 0.4-0.5 range found by Hansson (2007). Table 4.2 compares the *DSF* implied by these alternative values of the taxable income elasticity to the *DSF* implied by our benchmark assumption that $\varepsilon_w^L = 0.2,$ while maintaining all the other parameter values assumed in our benchmark scenario.

Table 4.2 Degree of self-financing (%) under alternative assumptions on the elasticity of taxable labour income

	Elasticity of taxable labour income (ε_w^L)		
Cut in	0.1	0.2	0.4
Labour income tax (t^w)	12	24	48
Consumption tax (t^w)	8	16	32
Business income tax (t^w)	17	29	53
Savings income tax (t^w)	26	35	54

Note: Rounded numbers.

Source: Own calculations based on Sørensen (2010).

We see that *DSF*s for the labour income tax and the consumption tax are simply proportional to the size of the elasticity of taxable labour income. This strict proportionality stems from the link between the (compensated) wage elasticities of savings and labour supply reported in equation (B.3). Once this link is accounted for, all terms in the formulas for DSF_{t^w} and DSF_{t^c} in (B.2) and (B.4) vary in proportion to ε_w^L. With a relatively optimistic elasticity estimate of 0.4, Table 4.2 shows that almost half of the static revenue loss from an across-the-board cut in marginal labour income tax rates will be recouped via an increase in the various tax bases.

Table 4.2 also shows that the *DSF*s associated with cuts in business income taxes and savings income taxes are quite sensitive to the elasticity of taxable labour income. By raising investment, a business income tax cut raises the demand for labour and drives up the real wage, so the greater the net wage elasticity of labour supply, the greater is the resulting increase in the revenue from taxes on labour income, consumption and savings (since consumption and savings increase with labour income). Further, because the (compensated) elasticity of labour supply with respect to the after-tax interest rate varies positively with ε_w^L (see equation (B.8)), a cut in the tax on savings income generates a larger positive labour supply response – and hence a larger dynamic revenue gain – the larger the value of ε_w^L.

Overall, it appears that any degree of uncertainty relating to the size of the elasticity of taxable labour income with respect to the marginal after-tax wage rate translates into a roughly corresponding degree of uncertainty regarding the degree of self-financing associated with a tax cut.

The marginal deadweight loss from the corporation tax: sensitivity analysis

The dynamic effects of tax cuts on business tax revenue depend in part on the initial marginal effective tax rate on business income (m^k). Estimating this variable can be quite complex, since one has to allow for the various rules defining the business income tax base (see Sørensen, 2010, Appendix A). The estimate for m^k used in our benchmark calculations of the degrees of self-financing accounts for the fact that the tax code subsidises debt finance through the full deductibility of nominal interest payments, as explained in Section 2. Because of this tax shield, the average value of the marginal effective tax rate on business income was estimated to be only 7.6 percent, considerably below the statutory corporate income tax rate of 26.3 percent.

However, this estimate for m^k assumes that the deductions for depreciation allowed by the tax code correspond to the true rates of depreciation of business assets. Yet in practice depreciation allowances often exceed the actual rates of depreciation of assets such as buildings and machinery. Such accelerated depreciation for tax purposes reduces the marginal effective tax rate on business income by driving taxable business income below the actual economic income.

Based on the current Swedish rules for depreciation allowances and the best available estimates of true rates of economic depreciation, one can estimate the degree to which taxable business profits fall below the true economic profits flowing from investments in buildings and in a "typical" piece of machinery (see Sørensen, 2010, Appendix C). Such a calculation suggests that the average value of m^k may be as low as minus 2.4 percent. In other words, at the margin it appears that the current Swedish tax rules imply a small *subsidy* to business investment, stemming from the combination of accelerated depreciation and the favourable tax treatment of debt finance.

It turns out that when the initial value of m^k plugged into the formulas (B.2), (B.4) and (B.7) is minus 2.4 percent rather than the 7.6 percent assumed in our benchmark calculations, the degrees of self-financing associated with cuts in the taxes on labour income, consumption and savings income are barely affected. However, the estimated degree of self-financing for a business income tax cut (DSF_{t^k}) changes significantly, falling from 29.7 percent to 21.8

percent, as shown in the first column in Table 4.3. The 21.8 percent *DSF* is lower than the 24 percent *DSF* associated with a labour income tax cut in our benchmark scenario. The reason is that since the marginal business investments are now *subsidised* by the tax system, the boost to investment generated by a business tax cut (i.e., a further increase in the tax subsidy) will now cause an additional loss of revenue from the business income tax which will reduce the overall dynamic revenue gain from the higher economic activity. In other words, when the initial marginal effective tax rate on business investment is negative, a cut in a source-based business income tax like the corporation tax actually generates a smaller efficiency gain than a cut in marginal tax rates on labour income, as the bottom line in equation (B.5) makes clear.

Table 4.3 The degree of self-financing (%) associated with a business income tax cut

	m^k	DSF_{t^k}	ε_ρ^K	DSF_{t^k}
Benchmark scenario	0.076	29.4	1	29.4
Alternative scenario	-0.024	21.8	0.5	26.7

m^k = marginal effective tax rate on business income

ε_ρ^K = numerical elasticity of capital demand w.r.t. the user cost of capital

Source: Own calculations based on Sørensen (2010).

From (B.5) we see that the degree of self-financing for a business income tax cut also depends on the numerical elasticity of capital demand with respect to the user cost of capital (ε_ρ^K), since this elasticity determines the magnitude of the investment response to a lower business tax. As mentioned earlier, most empirical studies suggest that ε_ρ^K is between 0.5 and 1, where the latter estimate is often used as a benchmark since it is consistent with a constant capital income share of GDP. It is reassuring to note from the last column in Table 4.3 that the degree of self-financing is not very sensitive to variations in the value of the elasticity of capital demand.

The marginal deadweight loss from the capital income tax: robustness checks

Empirical research has found it hard to pin down the magnitude of the net interest rate elasticities of savings and labour supply. These elasticities do not matter for the degree of self-financing associated with cuts in the taxes on labour income, business income and consumption, but they do matter for the degree of self-financing in case of a cut in the marginal effective tax rate on savings income (DSF_{t^r}), e.g., a cut in the personal capital income tax rate. Our benchmark scenario assumed a zero uncompensated interest elasticity of saving, consistent with the observation of a fairly stable household savings rate over the long run. However, because of offsetting income and substitution effects of a change in the net interest rate, the uncompensated interest elasticity of saving ($\hat{\varepsilon}_r^S$) could actually be negative. Table 4.4 shows that the degree of self-financing associated with a cut in the savings income tax drops from roughly 35 percent to 29 percent if $\hat{\varepsilon}_r^S$ drops from 0 to minus 0.2. In this "low-elasticity" scenario the *compensated* net interest elasticity of saving implied by equation (B.9) (for plausible values of the other parameters) drops to 0.37, compared to a value of 0.57 in our benchmark scenario. An alternative "high-elasticity" scenario could be represented by an uncompensated interest elasticity of saving of 0.4, corresponding roughly to the early and much disputed estimate by Boskin (1978). In this case the compensated elasticity implied by (B.9) would be 0.97, and the degree of self-financing under a capital income tax cut would rise to almost 48 percent, as reported in Table 4.4.

Table 4.4 The degree of self-financing (%) associated with a cut in the savings income tax

	Uncompensated interest elasticity of savings	DSF_{t^r}	*Length of savings period (years)**	DSF_{t^r}
Benchmark scenario	0	35.4	25	35.4
Alternative scenario	-0.2	29.4	20	30.5
Alternative scenario	0.4	47.5	30	40.3

*Average time distance between earning of labour income and earning of savings income.

Source: Own calculations based on Sørensen (2010).

As we explained in Section 4.2, the average time distance between the earning of labour income and capital income in the life cycle of the representative taxpayer matters for the *DSF* when the capital income tax is cut. The longer the time distance, the longer it takes before the government suffers a loss of revenue from the capital income taxes payable by the current young generation of taxpayers over their life cycle, so the heavier is the discounting of the future static revenue loss from the tax cut. When workers increase their labour supply in response to the higher net return to saving, the resulting extra revenue from taxes on labour income, consumption and business income will therefore be larger relative to the (more heavily) discounted future static revenue loss from the capital income tax cut. Measured in present value terms, the degree of self-financing will therefore be higher. It is difficult to estimate the time distance between the earning of labour income and capital income for the average taxpayer, but in the standard life cycle model underlying our analysis it is likely to fall within the range of 20 to 30 years. The right-hand part of Table 4.4 shows that the degree of self-financing varies between roughly 30 and 40 percent within this range; a variation that is not disturbingly high.

High versus low elasticities: how much does it matter overall?

To highlight the importance of each individual parameter, we have so far varied one parameter value at a time while keeping other parameters constant. To illuminate the degree of uncertainty associated with tax policy experiments, it is also of interest to compare alternative scenarios where several key parameters take on either "favourable" or "unfavourable" values at the same time. For example, debates on tax policy often feature a controversy between those who believe in strong taxpayer responses to changes in tax rates and those who do not. In the case of a tax increase, a favourable scenario is one with low behavioural elasticities, since this will imply a low marginal deadweight loss. In case of a tax cut, a favourable scenario is characterized by high elasticities which will secure a high degree of self-financing.

The "low-elasticity" scenario in Table 4.5 assumes that *all* key elasticities take on the lowest of the values that we have considered above, whereas the "high-elasticity" scenario in the table assumes that all elasticities have the highest of the values considered earlier.

In the low-elasticity case we see from Table 4.5 that the degrees of self-financing for the various taxes vary between 8 and 20 percent, reflecting relatively small tax distortions simply because taxpayers do not respond very much to the disincentives generated by taxation. By contrast, the high-elasticity scenario involves degrees of self-financing in the 32-66 percent range as economic activity responds quite strongly to taxation.

Table 4.5 The degree of self-financing (%) under alternative elasticity assumptions

Cut in	*Low-elasticity scenario* $\varepsilon_w^L = 0.1 \;\; \varepsilon_r^L = 0.01$ $\varepsilon_w^S = 0.07, \;\; \hat{\varepsilon}_r^S = -0.2, \; \varepsilon_\rho^K = 0.5$	*High-elasticity scenario* $\varepsilon_w^L = 0.4 \;\; \varepsilon_r^L = 0.05$ $\varepsilon_w^S = 0.28, \;\; \hat{\varepsilon}_r^S = 0.4, \; \varepsilon_\rho^K = 1.0$
Labour income tax	12	48
Consumption tax	8	32
Business income tax	15	53
Savings income tax	20	66

Source: Own calculations based on Sørensen (2010).

In other words, the degrees of self-financing are about three to four times as large in the high-elasticity than in the low-elasticity scenario, reflecting the considerable degree of uncertainty regarding the magnitude of tax base responses to changes in tax rates. However, even in the case of high elasticities the degree of self-financing remains well below 100 percent for all tax instruments, implying that general tax cuts are far from being fully self-financing.

Of course there is no guarantee that the two scenarios in Table 4.5 actually span the full range of possible degrees of self-financing. On the other hand, recall that recent empirical estimates of the elasticity of taxable income in Sweden (corresponding roughly to our parameter ε_w^L) tend to fall in the range between 0.2 and 0.5, and note that our estimates of the elasticities ε_r^L and ε_w^S are derived from the value of ε_w^L. Against this background our low-elasticity scenario does in fact seem to represent a rather conservative set of elasticity assumptions, and our high-elasticity scenario does capture the upper region of prevailing empirical elasticity estimates.

The present approach versus other approaches to the calculation of deadweight loss

The order of magnitude of the marginal deadweight losses estimated above is fairly well in line with most of the traditional public finance literature on the efficiency costs of taxation. It is particularly interesting to compare our analysis with the early study by Ingemar Hansson (1984) of the efficiency cost of taxation in Sweden. Like many other previous and later studies, Hansson measured the efficiency cost in terms of the so-called Marginal Cost of Public Funds (*MCPF*) which is defined as the welfare cost to taxpayers of raising an additional krona of tax revenue. In Section 4.1 we introduced the notation ΔE to denote the amount that would be needed to compensate taxpayers for a tax rate increase which generates the additional revenue ΔR. Thus ΔE is a measure of the welfare cost of the tax increase. Recalling that this welfare cost equals the static revenue gain from the tax hike ($\Delta E = \Delta R^s$) and that the degree of self-financing is defined as $DSF = -\Delta R^d / \Delta R^s$, we may write the welfare cost per extra krona of revenue raised (the Marginal Cost of Public Funds) as follows:

$$MCPF = \frac{\Delta E}{\Delta R} = \frac{\Delta E}{\Delta R^s + \Delta R^d} = \frac{\Delta R^s}{\Delta R^s + \Delta R^d} = \frac{1}{1 - DSF}. \qquad (8)$$

Equation (8) shows that there is a close link between the Marginal Cost of Public Funds and our concept of the degree of self-financing. The *MCPF* is sometimes calculated on the assumption that the extra tax revenue is used to finance an additional supply of public services. In that case the dynamic revenue effect ΔR^d will be influenced by the income effect of the tax increase, as taxpayers may change their behaviour in response to the fall in their disposable income. By contrast, the analysis in this chapter assumes that taxpayers are compensated for the tax hike, so in our context it is natural to assume that the extra tax revenue is spent on (lump sum) transfers to households. In the study by Hansson (1984) mentioned above, the author used Swedish 1979 data to estimate the *MCPF* in Sweden for different tax instruments and different uses of the additional tax revenue.[23] For increased spending on

[23] Note that the *MCPF* will differ across different tax instruments and different uses of the extra public funds unless policy makers have optimized the fiscal system so that the marginal

transfer payments financed by a general increase in the marginal tax rates on labour income, Hansson found an *MCPF* equal to 1.47, assuming a labour supply elasticity of roughly the same magnitude as the one assumed in our bencmark scenario. In that scenario we estimated the *DSF* for the labour income tax to be 0.24, based on Swedish 2008 data. When that estimate is inserted into (8), it implies an *MCPF* equal to 1.32. This is of the same order of magnitude as Hansson's estimate, although somewhat lower. Because marginal tax rates on labour income have fallen between 1979 and 2008, we would indeed expect to find a lower *MCPF* for the latter year, since our formula (B.2) implies that the DSF (and hence the *MCPF*) is lower the lower the marginal labour income tax rate.

While our estimates of the *DSF* square reasonably well with the traditional public finance literature, the recent years have witnessed the emergence of an alternative macroeconomic literature on so-called "dynamic scoring" which tends to find considerably higher degrees of self-financing of tax cuts (for an example of this approach which includes estimates of the welfare costs of taxation in Sweden, see Jonsson and Klein (2003)). This literature typically uses some version of the neoclassical "work horse" model of economic growth which is often used for the purpose of theoretical macroeconomic analysis.[24]

A recent example of this approach is provided by Trabandt and Uhlig (2009) who set up a neoclassical growth model which is calibrated to data from 1995 to 2007 for the United States and 14 western European EU countries with the purpose of studying the quantitative effects of changes in tax rates on labour income, capital income and consumption. Based on their benchmark calibration of the model, the authors claim that the degree of self-financing associated with a labour income tax cut in Sweden is 86

cost of raising an extra krona of revenue is the same regardless of the tax instrument used and regardless of the way the revenue is spent.

[24] Technical note: we are referring here to the so-called Ramsey model of economic growth where successive generations are linked by altruistic bequest motives so that consumers act as if they had an infinite horizon. By contrast, the standard life cycle model underlying our analysis of the deadweight loss from taxation assumes that consumers have a finite horizon. It should be noted that some of the recent macroeconomic literature studying public finance issues works with models in which not only the level of economic activity, but also the long-run rate of economic growth is affected by taxation. In these models the distortionary effects of taxation are typically even higher than in the Ramsey model. For an example of this approach, see Ireland (1994), and for a critical evaluation of its quantitative implications for the "Laffer curve", see Agell and Persson (2001).

percent and that the *DSF* for a capital income tax cut in Sweden is 116 percent. Since a *DSF* of 100 percent means that no additional revenue can be raised through a rise in the tax rate – because the static revenue gain is fully offset by the dynamic revenue loss – these estimates imply that Sweden is quite close to the revenue-maximizing labour income tax rate and that the Swedish government could actually *increase* total tax revenue by lowering the capital income tax rate.[25]

There are at least two reasons why the study by Trabrandt and Uhlig (op.cit.) and related macroeconomic studies find much higher degrees of self-financing than those indicated by the present report. First, these authors assume a compensated wage elasticity of labour supply which is five times as high as the elasticity of 0.2 assumed in our benchmark scenario. The adoption of such a high labour supply elasticity reflects a convention introduced by the macroeconomic literature on so-called real business cycles. In this literature the short-run fluctuations in aggregate employment are taken to reflect voluntary changes in labour supply, including movements in and out of the labour force. To be able to explain the empirically observed employment fluctuations in this way, one has to assume a labour supply elasticity that is much higher than the one estimated in most empirical microeconometric studies of labour supply.

Second, in neoclassical growth models of the type used by Trabrandt and Uhlig (op.cit.) the long-run equilibrium real interest rate *after* tax is closely tied to the representative consumer's rate of time preference (the rate at which the consumer discounts future economic welfare relative to welfare today). Since the time preference rate is treated as a constant in these models, the after-tax real interest rate is also constant in the long run, so any increase in the capital income tax rate leads to a corresponding increase in the pre-tax real interest rate over the long haul. This assumption of full tax shifting is equivalent to assuming that the elasticity of savings with respect to the after-tax interest rate is infinitely high in the long run. With an infinite savings elasticity, it is hardly surprising that a capital income tax is found to be highly distortionary. Indeed, in the type of model used by Trabrandt and Uhlig, the optimal long-run capital income tax rate is zero (see Sørensen (2007).

[25] In the area of capital income taxation Sweden has thus passed beyond the peak of the "Laffer curve" which shows the amount of tax revenue as a function of the tax rate.

As these remarks suggest, the empirical microeconometric foundation for the high factor supply elasticities assumed by Trabrandt and Uhlig (2009) and similar macroeconomic studies is weak. If these studies motivate policy makers to engage in tax cuts (or to abstain from necessary tax increases) based on highly optimistic assumptions on the degree of self-financing, the end result could be serious macroeconomic instability.

Moreover, the analysis of Trabrandt and Uhlig (op.cit.) suffers from two further methodological problems. First, unlike the study by Hansson (1984) discussed earlier, it does not make the distinction between taxes on saving and taxes on investment which is so important in a small open economy. Instead, all taxes on capital are lumped together and assumed to be based on a pure source principle. Second, the authors' method of estimating effective tax rates (adopted from Mendoza, Razin and Tesar (1994)) makes no distinction between the average and the marginal tax rates, assuming instead that the estimated average tax rates are good proxies for the marginal tax rates. However, under a progressive tax the marginal and average tax rates deviate from each other by definition.

Unfortunately the weaknesses mentioned here are characteristic of many recent macroeconomic studies of the effects of taxation. Hence there are reasons to be skeptical of the very high degrees of self-financing typically found in these studies.

4.4 Summary and policy implications

Main findings

This chapter has estimated the marginal deadweight loss from the most important taxes in Sweden. The marginal deadweight loss is the difference between the amount that would be needed to compensate taxpayers for a rise in some tax rate and the government's net revenue gain from the tax hike. As we explained, the marginal deadweight loss created by an increase in some tax rate is equal to the degree of self-financing (*DSF*) associated with a cut in this tax rate, where the *DSF* is defined as the fraction of the initial static revenue loss which is recouped as the various tax bases expand due to the behavioural responses to the lower tax rate. Our method of calculating degrees of self-financing allowed for the

interaction among tax bases, i.e., the fact that an expansion (contraction) of one tax base has positive (negative) spillover effects on other tax bases. Our analysis also accounted for the different impacts of residence-based taxes on saving (such as the personal capital income tax) and source-based taxes on investment (e.g. the corporation tax).

We calculated degrees of self-financing associated with a cut in the marginal effective tax rates on 1) labour income, 2) consumption, 3) business income (taxed under the source principle), and 4) savings income (taxed under the residence principle). Our calculations were based on recent national income accounts data and revenue data for Sweden, and our benchmark estimates of the *DSF* assumed an elasticity of taxable labour income which was a bit conservative in the light of recent empirical estimates of this parameter for Sweden. When calibrating the interest elasticities of savings and labour supply about which relatively little is known, we exploited the links between these elasticities and the elasticity of taxable labour income implied by economic theory.

Given the set of benchmark parameter values that we considered to be most plausible, we estimated that a cut in consumption taxes will generate a dynamic revenue gain of about 16 percent of the initial static revenue loss. A cut in the marginal tax rate on labour income was found to have a degree of self-financing of about 24 percent, and a cut in the business income tax was estimated to have a *DSF* close to 30 percent, while the *DSF* generated by a cut in the savings income tax was found to be almost 36 percent.

In all the scenarios considered, we found that the *DSF* associated with a cut in indirect taxes on consumption is lower than the *DSF* for the three other tax instruments included in our analysis. The reason is that part of the consumption tax base is inelastic, since a part of aggregate consumption is financed out of public transfers to retirees and other individuals who have permanently left the labour market so that their labour supply does not respond to a change in the consumption tax rate.

When the initial marginal effective tax rate on business income is positive, we also saw that a business income tax cut (e.g. a cut in the corporate income tax rate) will always have a higher *DSF* than a cut in the labour income tax rate. The explanation is that in a small open economy with perfect capital mobility, the business tax cut induces a capital inflow and a resulting rise in domestic investment

which continues until the benefit from the tax cut has been fully passed on to domestic workers through a rise in real wages. Just like a labour income tax cut, a business tax cut therefore stimulates labour supply, but in addition it generates a capital import which expands the business income tax base further, thereby inducing a larger dynamic revenue gain than the dynamic gain from a labour income tax cut with the same static revenue cost. However, if the initial marginal effective tax rate on business income is negative, the capital inflow and extra investment caused by a further business tax cut will create a further loss of business tax revenue, since the marginal investments are subsidized by the tax system. In that case the DSF for a business tax cut *is smaller* than the *DSF* under a labour income tax cut.

In our benchmark calibration a cut in the marginal effective tax rate on savings income involves a larger degree of self-financing than a cut in the other tax rates included in our analysis. This may seem surprising since we assumed the uncompensated net interest elasticity of saving to be zero, in line with several empirical studies. However, our analysis revealed that even in this case the compensated interest elasticity of saving (the elasticity when the income effect of the tax change is neutralized) could be substantial, and it is the compensated elasticity that matters for the *DSF*.

To illustrate the degree of uncertainty attached to our estimates, we calculated the DSF for a range of different values of the key parameters. When all the (compensated) elasticities of labour supply and saving were set at values in the upper range of prevailing empirical estimates, the *DSF* for the various tax instruments was found to be three to four times as high as when all elasticities were set at values in the low range of empirical elasticity estimates. Yet, even in the high-elasticity scenario the *DSF* for all tax rates remained well below the 100 percent level that would make tax cuts self-financing. In all the alternative scenarios considered, the *DSF* for a cut in the savings income tax was higher or at least as high as the *DSF* for any other tax.

Policy implications

One robust conclusion from our analysis is that indirect consumption taxes have a lower *DSF* than the other taxes considered. Since a lower *DSF* indicates a lower marginal efficiency

loss from taxation, this finding might seem to suggest the desirability of a shift from direct to indirect taxation. However, the reason for the low marginal deadweight loss from consumption taxes is that they are partly paid by individuals outside the labour force whose labour supply does not respond negatively to a higher consumption tax rate. Many (perhaps most) of these individuals have relatively low current incomes. Moreover, an indirect consumption tax cannot account for the specific circumstances of the individual taxpayer, whereas the progressive personal labour income tax is based on the taxpayer's ability to pay (at least in principle). Concerns about equity may therefore make a shift from direct to indirect taxation undesirable even though such a shift would improve economic efficiency.

Another robust finding was that the *DSF* for a source-based business income tax like the corporation tax is always higher than the *DSF* for the labour income tax when the initial marginal effective tax rate on business investment is positive. In that case the corporation tax works in part like a labour income tax and partly as a selective tax on the use of capital inputs in domestic production. By lowering the marginal effective tax rate on investment to zero and recovering the revenue loss through a higher tax on labour income, policy makers can avoid the distortion to the use of capital inputs without making workers worse off, as demonstrated by our theoretical analysis in Section 1. To put it another way, since the marginal deadweight loss for the business income tax is larger than that for the labour income tax, it is efficient to shift from the former to the latter tax, and since the burden of the business income tax falls on workers anyway, there is no negative impact on income distribution from such a tax shift.

If the initial marginal effective tax rate on business investment is *negative*, the business income tax works instead like a subsidy to workers combined with a subsidy to capital inputs in production. In this case the demand for inputs is still distorted, and an efficiency gain can be reaped by raising the marginal effective investment tax rate to zero while lowering the labour income tax, since the latter tax now has the larger marginal deadweight loss.

However, the prescription of a zero effective tax rate applies only to the *normal* return to business investment, that is, the return on the marginal investment which is just barely worth undertaking. As stressed in Section 4.1, intra-marginal profits arising from location-specific rents can be taxed without distorting

investment incentives. Chapter 7 will discuss how the taxation of the normal return can be separated from the taxation of rents in practice.

As a final policy observation, the sensitivity analysis in Section 4.3 indicated that even though there is considerable uncertainty regarding the *DSF* for the savings income tax, the *DSF* for this tax is larger or at least as large as the *DSF* for the other taxes, unless the uncompensated interest elasticity of saving takes an implausibly large negative value. This suggests that the Swedish dual income tax system which allows the statutory (marginal) capital income tax rate to be lower than the marginal labour income tax rate promotes economic efficiency by avoiding an excessively high marginal deadweight loss from the taxation of savings income.

The nature and time horizon of the tax policy experiments

For a proper interpretation of the results presented in this chapter, it is important to be clear about the nature and the time horizon of the policy experiments considered. The estimated degrees of self-financing relate to a long time horizon where the economy has fully adjusted to the changes in tax rates. In particular, while our assumption of perfect capital mobility may be a reasonable approximation in the long run, it may take considerable time for the domestic capital stock to adjust fully to a change in tax rates, since there are costs of installing new capital equipment, and since firms cannot easily shift their operations and productive assets across borders. In the short and medium term (physical) capital is therefore only imperfectly mobile, so in the shorter run a part of the burden of a source-based business tax on the normal return will be borne by the owners of business assets.

Further, when considering the effects of a change in the labour income tax, we were in fact assuming an identical change in the marginal tax rate on all labour income, from the first to the last krona earned. We did not consider the specific effects of changing the marginal tax rate for top income earners. As we shall see in Chapter 6, the degree of self-financing associated with such a policy experiment will be higher than the *DSF* for an across-the-board change in the marginal tax rate for all workers.

In a similar way, when analyzing changes in the marginal tax rates on business income and savings income, we implicitly

assumed that the tax rate changes applied uniformly to all forms of investment and saving, respectively. In so far as a change in the average value of the effective marginal tax rate stems from a selective tax rate change applying only to certain forms of investment or savings, there will be additional distortions that were not accounted for in our measures of marginal deadweight losses. In Chapter 7 we shall see how one may quantify these additional efficiency losses from non-uniform taxation.

Our measure of the *DSF* for a change in the effective indirect tax rate on consumption likewise assumed that the tax rate change applied equally to the consumption of all goods and services. If the change in the tax rate applies only to certain goods and services, there will be additional effects on economic efficiency which we shall explore in the next chapter.

5 Taxes on consumption and pollution

Indirect taxes on goods and services are an important source of tax revenue in Sweden. In 2008 the value added tax (VAT) and excise taxes on specific goods and services generated almost 28 percent of total revenue, slightly higher than the 26.4 percent of total revenue collected through these taxes right after the Tax Reform of the Century in 1991.

This chapter discusses how indirect taxes should be designed and offers some proposals for reform of indirect taxation in Sweden. We start in Section 5.1 by briefly discussing the basic roles of indirect taxes: why is it useful to supplement the direct taxes on income by indirect taxes? Section 5.2 then considers the most important indirect tax, i.e., the VAT. A main issue is whether the VAT rate should be differentiated across different goods and services or whether the VAT should be levied at the same uniform rate on all forms of consumption. We discuss this issue at length since it has played a prominent role in the Swedish tax policy debate. In Section 5.3 we turn to a discussion of excise taxes, paying particular attention to the role of "green taxes" as an instrument of environmental policy. We also discuss the case for a further shift from taxes on income towards greater reliance on environmentally-related indirect taxes. Section 5.4 summarizes the main points and policy proposals made in the chapter.

5.1 The role of indirect taxes

By definition, indirect taxes on goods and services are impersonal taxes which cannot be conditioned on the individual taxpayer's ability to pay. In contrast, a direct tax like the personal income tax or a personal expenditure tax can take account of distributional

goals, since it can be based on the taxpayer's total income or consumption. One might therefore argue that indirect taxes are inherently inferior to direct taxes.

Governments nevertheless collect indirect taxes for a variety of reasons. The first one is pragmatic: by avoiding exclusive reliance on a single tax like the personal income tax, the risk of "overburdening" a single revenue source is reduced. In particular, some forms of income may be difficult to tax under the personal income tax, but when these incomes are spent, they can be subjected to indirect consumption taxes in so far as these are easier to enforce. Hence the total amount of tax avoidance can be reduced by relying on a mixture of direct and indirect taxes. Indirect taxes may also be easier and cheaper to administer exactly because they do not have to account for the specific circumstances of the individual taxpayer.

In addition to these practical arguments, the economic literature on taxation has pointed out that indirect taxes can help to alleviate market distortions, including distortions caused by the existence of direct taxes. For example, a personal income tax distorts labour supply by inducing taxpayers to work less and consume more leisure than they otherwise would have done. By taxing goods and services that are consumed jointly with leisure, and by subsidizing goods and services that tend to be consumed mainly while taxpayers are at work, indirect taxes can offset the tendency for the income tax to induce substitution from work to leisure. In this way differentiated indirect taxes can reduce the negative impact of the income tax on labour supply.

Further, the consumption of certain goods and services may generate so-called negative externalities, that is, one individual's consumption of some goods may have a negative impact on the welfare of other individuals. Tobacco, alcohol, and various polluting products (e.g. gasoline) are examples of goods whose consumption tends to generate negative externalities. In the absence of government intervention the consumption of such goods is too high from a social viewpoint. By levying excise taxes on these goods, the government can confront individual consumers with the social cost of the negative externalities and bring total consumption of these particular goods closer to the socially optimal level.

In practice, the use of differentiated indirect tax rates has often been motivated on distributional grounds. By levying high tax rates

on luxury goods that are mainly consumed by the rich, and by setting low or even negative tax rates on "necessities" that weigh heavily in the budgets of the poor, the system of indirect taxes may help to redistribute income towards the needy. As we shall see in the next section, this may be a legitimate use of indirect taxes if there are serious constraints on the possibilities of using direct taxes and targeted income transfers to redistribute income. However, we shall also see that in the absence of such constraints, the use of differentiated indirect taxes is an inefficient way of redistributing income.

Governments also frequently motivate the use of differentiated indirect taxes by a desire to promote or discourage the consumption of certain goods, even in cases where the consumption of these goods does not create any obvious external effects on the welfare of other consumers. For example, policy makers may set a low indirect tax rate on certain cultural goods and services because they think it is "good" for citizens to consume these products, or they may set a high tax rate on certain goods if they think it is "bad" for the individual citizen to consume too much of it. This so-called merit good argument for the use of differentiated indirect taxes is conceptually different from the externality argument, since the merit good argument involves a paternalistic judgement that consumers do not always know what is best for themselves. The merit good argument goes against the idea of consumer sovereignty, but it may be well founded in areas where high levels of consumption could cause addiction problems that are not fully anticipated by consumers, or in areas where some consumers may have self-control problems relating to consumption of goods with potentially negative long-term consequences for their physical or mental health. For example, if consumers have a tendency to procrastinate ("I want to quit smoking, but I'll wait until next month before I do so"), a high excise tax rate may help them to change their consumption pattern in a way they know will be in their own best interest in the long run even if it involves sacrifices in the short run. As this reasoning suggests, the merit good argument can potentially justify higher "sin" taxes on items such as tobacco and alcohol than would be warranted solely on the basis of a pure externality argument.

With these general observations in mind, we now turn to a more detailed discussion of indirect taxation in Sweden. In the next section on the Value Added Tax we will abstract from the existence

of externalities and focus on the problem of designing the VAT so as to minimize the distortions created by the tax system itself. In section 5.3 we will address the problem of countering externalities through the use of excise taxes.

5.2 The Value Added Tax

Basic VAT principles

The VAT is by far the most important indirect tax in Sweden, securing more than 20 percent of total tax revenue in 2008. The VAT has turned out to be a very effective revenue raiser and has accounted for a growing share of total revenue over time, in Sweden as well as in almost all other countries, as we saw in Chapter 1. Indeed, in the United States which is the only OECD country that has not yet adopted a VAT, opponents of this form of tax have frequently used the argument that introduction of a VAT would make it "too easy" to expand the size of the federal government!

One reason for the growing reliance on the VAT may be that a general tax on goods and services generates a relatively low deadweight loss because it falls on a relatively broad and inelastic base, as the previous chapter explained. The mechanics of the European-style VAT based on the invoice method also facilitates tax collection. A key feature of the VAT is that it is levied at multiple stages of production, with taxes on inputs credited against taxes on output. That is, while sellers must charge the tax on all of their sales, they can also claim a credit for the tax they have paid on their inputs. The advantage of this system is that revenue is secured by being collected throughout the process of production, but with tax being levied only on the value added in each stage of production and distribution so that there is no distortion of the vertical division of labour among firms in the production chain. Moreover, the invoice method of VAT collection essentially eliminates the incentive for evasion of tax on transactions among VAT-registered firms, since the gain for a seller who underreports the value of his sales is offset by the loss for the buyer who cannot document the value of his purchase so as to obtain credit for the input VAT. Finally, since exports are "zero-rated" - meaning that the VAT rate applied to export sales is zero, though credit is still

given for taxes paid on inputs – and because imports are subject to full domestic VAT, the VAT does not distort competition between domestic and foreign producers.[26]

Uniform versus differentiated value added taxation: some lessons from optimal tax theory

As described in Chapter 3, the 1991 Swedish tax reform package included a uniform VAT rate of 23.46 percent levied on a broad base, but as part of their management of the economic crisis of the early 1990s Swedish policy makers soon returned to a differentiated VAT. Today the Swedish VAT system involves a standard VAT rate of 25% applied to most goods and services, a reduced rate of 12% applied to foodstuffs, non-alcoholic beverages, hotel services and ski-lifts, and another reduced rate of 6% applied to a number of cultural services as well as sports events, passenger transport and books, newspapers, and periodicals. In accordance with the EU VAT directives, certain goods and services (e.g. education and health care) are tax exempt while others (e.g. financial services) are zero-rated. Under exemption no VAT is charged on the sale of these services, but the sellers do not receive a refund of the VAT paid on their inputs, so the value added in the earlier stages of production does get taxed. Under zero-rating, full credit is given for the input VAT and no VAT is charged on sales, so all of the value-added through the production chain is free of tax.

A basic policy issue in Sweden and elsewhere is whether the VAT should be uniform or whether the rates of VAT should be differentiated across the different goods and services? Before introducing more practical considerations, it may be useful to briefly review what the theory of optimal taxation can tell us about this long-standing issue.[27] A basic result in this strand of literature was established early on by Ramsey (1927) who considered how the government can raise a given amount of revenue from commodity taxes in a way that minimises the deadweight loss from

[26] In principle a uniform VAT levied on an origin basis (where exports bear domestic tax while imports are exempt) would also avoid distortions of competition once the domestic level of wages and prices has fully adjusted to the tax. However, this adjustment process may be time-consuming and/or may involve nominal exchange rate adjustments which could trigger speculative capital flows.

[27] The theory of optimal taxation and its practical policy relevance is discussed in more detail in Sørensen (2007 and 2009).

taxation (recall from Chapter 4 that the deadweight loss is the difference between the amount that would be needed to compensate taxpayers for the imposition of taxes and the actual tax revenue collected). Ramsey showed that minimisation of the deadweight loss requires a structure of indirect tax rates that induces the same proportional reduction in the (compensated) demand for all goods and services.[28] Thus the optimal indirect tax system seeks to avoid distorting the quantitative pattern of consumption, but since the demand for some commodities is likely to be more elastic than the demand for others, commodity tax rates should generally be differentiated to generate the same relative reduction in all quantities demanded. In other words, uniform taxation will generally not be optimal.

In the special case where the demand for each commodity depends only on the price of that commodity itself but not on the prices of other goods (i.e. when the so-called cross-price elasticities are zero), Ramsey's analysis implies that the optimal commodity tax rates are proportional to the inverse (compensated) own-price elasticities of demand, so goods with a high price elasticity of demand should be taxed at a relatively low rate, and vice versa. This famous "inverse elasticity rule" essentially seeks to minimise tax distortions to labour supply, for when consumers do not react to a tax-induced rise in the price of some good *A* by consuming more of other goods (that is, when cross-price elasticities are zero), the price elasticity of demand for good *A* only reflects that a higher price of that good makes working less attractive, because a given work effort now generates a smaller purchasing power. If the price elasticity of demand for good *A* is low, it thus means that this good can be taxed at a relatively high rate without reducing labour supply very much, and vice versa, so taxation according to the inverse elasticity rule will minimise the negative impact of commodity taxes on labour supply.

Another special case of Ramsey's optimal tax rule is the so-called Corlett-Hague rule derived for a simple economy where households consume two taxed commodities plus leisure (which cannot be taxed). In such a setting minimisation of the deadweight loss from taxation requires a relatively high tax rate on the

[28] Since the measurement of deadweight loss involves a thought experiment in which consumers are compensated for the imposition of tax through a lump sum transfer, their behavioural responses to taxation (and hence the optimal commodity tax rates) will be determined by the compensated rather than the uncompensated price elasticities of demand.

commodity which is less substitutable for or more complementary to the consumption of leisure (Corlett and Hague (1953)). By imposing a relatively high tax on goods that are consumed jointly with leisure, the government can thus offset the tendency of the tax system to boost the consumption of leisure at the expense of work. Thus the Corlett-Hague rule provides another illustration of the point that indirect taxes should be designed so as to minimise the tax distortions to labour supply that inevitably occur when only commodities (but not leisure) can be taxed.

The intuition behind the inverse elasticity rule and the Corlett-Hague rule helps us understand the conditions under which uniform commodity taxation is in fact optimal. As shown by Sandmo (1974), the following two conditions must hold for uniform indirect taxation to be optimal: First, all goods must be equally substitutable for leisure.[29] Second, the income elasticity of demand for all goods must be identical, i.e., if real disposable income falls by x percent, the demand for each commodity must also fall by *x* percent. When these two conditions are met, the introduction of a uniform tax will ensure the same relative reduction in the (compensated) demand for all goods, as required by the general Ramsey rule, for even though the uniform commodity tax makes working less attractive and induces consumers to substitute leisure for material consumption, it does not affect the composition of consumption when all goods are equally substitutable for leisure and have the same income elasticity of demand. Sandmo's study is important by demonstrating the strong conditions that must be met for uniform commodity taxation to be theoretically optimal when the only goal of indirect taxation is to minimise the deadweight loss from taxation.

The study by Diamond (1975) showed how the Ramsey rule is modified in a world where consumers differ in terms of their preferences as well as their earnings potential, and where the government trades off the goal of minimising deadweight loss against the goal of redistributing income from the rich to the poor via the system of indirect taxes. Diamond's analysis indicated that while concerns about economic efficiency still call for relatively high taxes on goods that are inealastic in demand (as in Ramsey's original analysis), concerns about equity call for relatively low tax rates on commodities that weigh heavily in the budgets of low-

[29] In the technical jargon of economists, the consumer's utility function must be separable in leisure and commodities. See, e.g., Sørensen (2009, section 2) for further explanation.

income families. Since such goods tend to be "necessities" with a relatively low price elasticity of demand, whereas the luxury goods predominantly consumed by the rich tend to be more elastic in demand, the study by Diamond suggests a dilemma: while the pursuit of efficiency seems to require high tax rates on necessities and low tax rates on luxuries, the goal of equity may often require exactly the opposite.

The "Ramsey literature" referred to above assumes that the government wishes to collect a given amount of revenue from indirect taxes. The perspective broadens when the government can freely decide whether it wants to raise the necessary revenue from indirect taxes or from the progressive personal income tax. When the government cares about equity as well as efficiency, as Diamond (op.cit.) assumed, and when the personal income tax can be conditioned on the taxpayer's total income whereas indirect taxes cannot, is there any role for indirect taxes at all?

The benchmark result in the literature on this issue was established by Atkinson and Stiglitz (1976). They showed that if all goods are equally substitutable for leisure, and if the government can use a progressive personal income tax to accommodate its revenue needs as well as its distributional goals, it is inoptimal to impose differentiated commodity taxes even if different goods have different income elasticities, that is, even if some goods are consumed primarily by the rich while other goods are consumed mainly by the poor. The intuition for this result may be explained as follows. If no goods are better substitutes for leisure than others, the government cannot make the consumption of leisure less attractive by levying a relatively high tax on any particular good. In other words, differentiated indirect tax rates cannot be used to offset the negative impact of the income tax on labour supply, so the desire to minimise the deadweight loss from taxation does not justify a deviation from uniform indirect taxation. Nor does the desire to redistribute income justify differentiated taxation, for even if certain goods are consumed mainly by the rich, there is no case for taxing these goods at relatively high rates, since the progressive personal income tax is a more precise instrument for redistributing income from the rich to the poor.

Atkinson and Stiglitz (op.cit.) thus found that when the government can freely deploy a progressive personal income tax, the income elasticities of demand for the different consumer goods do not need to be identical to justify uniform indirect taxation. But

like Sandmo (1974), they also found that the optimality of uniform taxation does require all goods to be equally substitutable for leisure. This assumption is hardly realistic, since it is easy to think of goods that tend to be consumed jointly with leisure, e.g., golf club services, movie theatre services, visits to museums and natural parks, etc. Against this background, Christiansen (1984) analysed how indirect taxes should be designed when the government can also deploy a progressive income tax and when some goods are better substitutes for (or more complementary to) leisure than others. Christiansen found that relatively high indirect tax rates should be levied on goods that are complementary to leisure in the sense that more of those goods is consumed if more leisure is obtained at constant income. To understand this result, note that high-wage earners do not have to work as much as low-wage earners to earn a given amount of income. At any given income level, high-wage earners can therefore enjoy more leisure than low-wage earners. But if certain goods are consumed jointly with leisure and if these goods are taxed at relatively high rates, the government can make it less attractive for high-wage earners to engage in leisure rather than work. In this way the government can offset the negative impact of the progressive income tax on the high-wage earners' incentive to work, so differentiated indirect taxes can reduce the efficiency cost of redistributing income from the rich to the poor via the income tax. Note that this finding by Christiansen has the same flavour as the Corlett-Hague rule: the indirect tax system should discourage the consumption of commodities that tend to be consumed jointly with leisure.

Like Atkinson and Stiglitz (1976), Christiansen (1984) assumed that taxpayers have the same preferences and differ only in their innate ability to earn income. Saez (2002) extended Christiansen's analysis to a setting where consumers have different tastes and showed that the optimal tax system does not only involve relatively high indirect tax rates on goods that are consumed jointly with leisure, but also high tax rates on commodities for which high-income earners have a relatively strong taste. In other words, if differences in income levels are the only reason why consumption patterns differ across taxpayers, there is no case for imposing relatively high indirect tax rates on commodities that weigh heavily in the budgets of the rich, since the progressive income tax is a more effective instrument for redistributing income (this is the Atkinson-Stiglitz result mentioned above). But when consumption

patterns also differ because of differences in tastes, so that individuals at similar income levels may have different consumption bundles, Saez (op.cit.) found a case for imposing relatively high tax rates on goods that tend to be preferred by individuals with a high earnings potential. For example, people with a strong taste or gift for higher education will end up with a high earnings potential, and at the same time such individuals may also have a strong taste for consuming certain cultural products and services, say. In that case Saez' analysis implies that these cultural goods should carry a high indirect tax rate since this helps to redistribute income away from people with a high ability to earn income towards those with smaller abilities. The reason is that the progressive income tax becomes a less well targeted instrument for redistribution from high-ability to low-ability individuals when tastes differ. In particular, a low-ability person may yet end up with a relatively high income simply because he is a 'workaholic' who works very hard, and it is not optimal to punish such individuals through a very progressive income tax when there is a possibility of taxing high-ability people via indirect taxes on the goods they prefer to consume.

Beyond optimal tax theory: the case for a uniform VAT

Our review of optimal tax theory indicates that uniform commodity taxation is optimal only if all goods and services are equally substitutable for leisure. Since this is not realistic, there might seem to be a strong case for a differentiated value added tax with many different VAT rates reflecting the different degrees of substitutability with leisure across the spectrum of goods and services. A number of arguments nevertheless speak in favour of a uniform VAT.

First of all, the government does not have and probably never will obtain sufficiently reliable information on the various compensated own-price elasticities and cross-price elasticities with leisure that is needed to implement the optimal differentiated VAT rate structure. Although it is not difficult to point out certain goods and services that tend to be consumed jointly with leisure, it is much more difficult to estimate the compensated cross-price elasticities across all taxable goods and services. The empirical studies by Assarsson (2005) and Morin (2005) carried out for the

Swedish VAT commission (SOU 2005:57) illustrate this point. Although carefully designed, using state-of-the-art econometric techniques and comprehensive data sets, these studies failed to obtain precise and plausible estimates of the compensated cross-price elasticities with leisure which are a key to designing an optimal indirect tax structure. Assarsson (2005, p. 471) concluded his study by stating that "In the context of optimal taxation the cross-price elasticities are interesting, especially those between Leisure and the various consumption goods. Generally, these elasticities use to be estimated with much less precision than the own-price elasticities and this is the case here also." Moreover, Morin (2005, p. 438) reported that when he attempted to calculate optimal differentiated VAT rates using Assarsson's elasticity estimates, he ended up with negative optimal tax rates for all goods and services, and when he used elasticity estimates from his own econometric study of consumer demand in Sweden, he obtained a similar unrealistic result. Further, when consumer tastes differ across taxpayers, we saw that optimal tax theory calls for relatively high indirect tax rates on goods for which the people with a high earnings ability have a relatively strong taste (unless such goods are close substitutes for leisure). Although examples of such goods may not be so difficult to find (we have already mentioned cultural goods as one possible example), the government may not have the comprehensive knowledge of the distribution of consumer tastes needed to implement this taxation principle in a consistent manner. As long as our knowledge of the relevant price elasticities and consumer tastes is so imperfect, there is no guarantee that attempt to differentiate VAT rates in accordance with optimal tax theory would lead to a better result than a uniform VAT.

Second, since technological progress produces new consumer goods all the time, and since consumer tastes may also change, the own-price and cross-price elasticities determining the optimal differentiated commodity tax rates will also change over time. This instability is an important reason why it is so difficult to obtain reliable econometric estimates of the relevant elasticities. But even if these elasticities could easily be reestimated with a high degree of precision, the recurrent changes in price elasticities would necessitate frequent changes in VAT rates to maintain consistency with the principles of optimal taxation. Such frequent and virtually unpredictable changes in tax rates would introduce an element of

risk and uncertainty into the tax system that would in itself tend to reduce economic welfare.

Third, as stressed by the Swedish VAT commission (SOU 2006:90), a uniform VAT is easier to administer and less susceptible to fraud than a VAT system with several differential VAT rates, since a uniform VAT does not require any borderlines to be drawn between different goods categories.

Fourth, a VAT with many different rates may distort product innovation, as firms try to develop new products or services that fall on the "right" side of the borderline between high-taxed and low-taxed goods. Kleven and Slemrod (2009) and Sallee and Slemrod (2009) mention several examples of such socially wasteful tax-driven product innovation.[30]

Fifth, when consumer tastes differ across taxpayers, we saw that optimal taxation requires high indirect tax rates on goods that tend to be preferred by people with a high earnings ability. However, people with roughly the same earnings capacity may also have different tastes. A differentiation of tax rates according to tastes would therefore violate the principle of horizontal equity, since it would mean that taxpayers with the same earnings potential but different tastes (and hence different consumption bundles) would pay different amounts of indirect tax. This might be seen as unfair.

Sixth, acceptance of differentiated taxation as a general principle may invite special interest groups to lobby for low tax rates on particular economic activities, so adherence to a principle of uniformity may provide a stronger bulwark against wasteful lobbyism.

Seventh, the EU VAT directives do not allow EU member states to introduce more than two reduced VAT rates as exceptions from the standard rate. This rules out the possibility of the extensive differentiation of tax rates that would be needed for a rigorous implementation of optimal tax principles.

It is also worth noting that the current Swedish VAT rate structure goes against the principles of optimal taxation in several ways. Despite the general uncertainty regarding price elasticities mentioned earlier, it is fairly well established that the price elasticity of demand for most food items tends to be quite low.

[30] An amusing example reported by Kleven and Slemrod (2009, p. 2) comes from Indonesia where preferential indirect tax treatment of motorcycles led to the creation of a new type of motorcycle with three wheels and long benches at the back seating up to eight passengers – car-like vehicles, but not so car-like as to be taxed as cars!

According to "Ramsey principles" of optimal taxation the VAT rate on food should therefore be relatively high, whereas Sweden applies a reduced VAT rate to foodstuffs. The Swedish policy is officially motivated by a desire to redistribute income towards low-income households. But as our discussion of optimal tax theory suggests, the distributional argument for a low VAT on food is relevant only if the government cannot use a progressive income tax (coupled with targeted income transfers) to redistribute income towards the most needy groups, and/or if people with a high innate earnings capacity have a systematically weaker taste for food than other individuals. Neither of these assumptions seems plausible. In particular, although the poor tend to spend a larger share of their budget on food than the rich, this probably reflects a low income elasticity of demand for food rather than a systematic difference in the taste for food across different income groups. Indeed, even though the income elasticity of food demand is low on average, there may be rich individuals whose preferences lead them to spend a lot of money on (expensive) food, and there may be poor people who choose to spend a relatively small share of their budget on food. A reduced VAT rate on food is therefore a rather imprecise instrument for redistributing income towards the poor. A more precise instrument would be an appropriate degree of progressivity of the personal income tax combined with targeted income transfers to selective groups with special needs such as single-parent families with children, pensioners with low incomes, etc.

The low Swedish VAT rate on books, newspapers, periodicals and a number of cultural services also seems hard to defend from the viewpoint of optimal tax theory. In fact that theory suggests that these goods should be taxed at a relatively high rate, in part because they tend to be consumed jointly with leisure, and partly because highly-educated people with a strong earnings potential seem to have a relatively strong taste for cultural goods and services. The low Swedish VAT rate on sports events and ski-lifts likewise goes against the principles of optimal taxation, since these goods also tend to be complementary to leisure. Of course, Swedish policy makers may feel that there are "merit good" arguments for supporting cultural activities and sports events etc., but in that case it might be preferable to grant the support in the form of direct subsidies rather than through a (hidden) tax subsidy. A direct subsidy is a more transparent form of support that could help to ensure a high-quality public budgeting process where the

different public policy goals are traded off against each other in a rational manner.

When all the above arguments are taken together, the case for a move to a uniform VAT in Sweden seems strong. This would be a return to the uniformity principle underlying the Tax Reform of the Century, and it would accord with the recommendation of the Swedish VAT commission (SOU 2006:90). As suggested by that commission, a part of the revenue gain from the abolition of the reduced VAT rates could be reserved for an increase in targeted transfers to single-parent familes and pensioners. According to the commission's estimates, the impact on income distribution of an abolition of the reduced VAT rates would be minor, so compensating the losing groups would only cost about 1 billion SEK per year (2005 level). The remaining revenue gain could be used to lower the standard VAT rate. The very limited impact of eliminating the reduced VAT rate on food confirms that the current Swedish VAT policy is a rather ineffective way of redistributing resources towards the poor.

As shown in Box 5.1, a uniform VAT would tend to work like a proportional tax on the sum of wages, income transfers, bequests and "pure" profits, i.e. profits above the normal rate of return required by the capital market. In principle, pure profits can be taxed with little distortionary effects under the VAT as long as consumers are relatively immobile across borders, since emigration from Sweden is the only way of avoiding the Swedish VAT (which is based on the destination principle according to which goods and services are taxed in the country where they are consumed). Income transfers are also a tax base that is little affected by the VAT, as we explained in Chapter 4. Moreover, since many bequests may be accidental (representing wealth that was held by the deceased donor as a buffer to finance consumption in case he/she turned out to live for very long), the amount of bequests is likely to be rather insensitive to the imposition of VAT. All of these factors tend to make the VAT base relatively inelastic, implying a relatively low deadweight loss from this form of tax.

Box 5.1 What gets taxed under a uniform general VAT?

The VAT is usually seen as a tax on consumption, but a general VAT levied at a uniform rate on all goods and services may also be seen as a proportional income tax which includes net bequests received in the tax base but exempts the normal return to saving from tax. To illustrate, suppose the consumer's life cycle is divided into two periods, indicated by subscripts 1 and 2. Let C_i, W_i, Π_i and T_i denote consumption, wage income, rents ("pure profits" exceeding the going market interest rate) and transfer income in period i, respectively, and suppose the consumer receives an inheritance I in period 1 and leaves a bequest B at the end of period 2. If S is the saving undertaken in period 1, r is the interest rate, and t is the uniform indirect tax on consumption, assumed constant over time, the consumer's budget constraints in the two periods are:

Period 1: $S = W_1 + \Pi_1 + T_1 + I - (1+t)C_1$, Period 2: $(1+t)C_2 + B = (1+r)S + W_2 + \Pi_2 + T_2$.

Eliminating S and consolidating, one obtains the lifetime budget constraint:

$$C_1 + \frac{C_2}{1+r} = (1-\tau)\left(W_1 + \Pi_1 + T_1 + \frac{W_2 + \Pi_2 + T_2}{1+r} + I - \frac{B}{1+r} \right), \qquad \tau \equiv \frac{t}{1+t} .$$

This shows that a uniform ad valorem commodity tax levied at the rate t is equivalent to a proportional tax levied at the rate $\tau = t/(1+t)$ on the sum of wages, rents, transfers and the present value of net bequests received $\left(I - \frac{B}{1+r}\right)$.

How big is the potential efficiency gain from a uniform VAT?

In Box 5.2 we offer a method for estimating the gain in economic efficiency that would result from a move to a uniform broad-based VAT in Sweden. The method assumes that the new uniform VAT rate is set at a level that ensures an unchanged overall level of consumer prices. In that case the VAT reform will not affect consumer welfare; nor will it affect labour supply, savings and

business investment, so there will be no spillover effects on other tax bases. We may then ask whether such a VAT reform will enable the government to collect an additional indirect tax revenue. If the answer is "yes", there is a net gain to society, since the government has gained revenue without reducing consumer welfare (the extra revenue can of course be returned to the private sector in the form of lower taxes or higher transfers, or it can be used to expand the supply of public services).

Our method of calculation is designed to estimate the efficiency gain that could be reaped if all goods and services other than housing services could be subjected to a uniform VAT (in Chapter 7 we shall estimate the further gain which could be made by moving to a uniform tax treatment of housing and all other goods). It should be stressed that some of the current exemptions from VAT in Sweden are mandated by the EU VAT Directives, so eliminating these exemptions would require a change in EU rules or a special permission for Sweden to impose VAT in these areas. In so far as this is unrealistic, our method will somewhat overestimate the gain from moving to a uniform VAT only on those goods and services that can be taxed under EU rules.

Formula (B.4) in Box 5.2 expresses the revenue gain from a VAT reform of the type just mentioned as a proportion of the value of the total consumption of goods and services other than housing. In applying the formula, we have split total non-housing consumption into a number of goods categories corresponding to the number of VAT categories, including goods that are zero-rated or exempt from VAT. The use of the formula requires an assumption on the degree of substitutability between the different goods categories, measured by the so-called elasticity of substitution which reflects the willingness of consumers to substitute between goods as their relative prices change. Consumer spending on each of our broad goods categories tends to be fairly stable relative to total consumption, so we assume a substitution elasticity equal to one, since this can be shown to imply constant budget shares for each goods category. We also need an estimate of the total VAT and excise tax rate on each goods category. In Sweden the excises fall only on goods that are subject to the standard 25 percent VAT rate, so we have calculated the effective excise tax rate on this goods category as the ratio of excise tax revenue to the value of the consumption of goods subject to standard VAT. With these assumptions we can calibrate the other

parameters in formula (B.4) to make them consistent with the observed pattern of consumption in Sweden, as explained in Box 5.2.

Following this procedure, we estimate that a move towards a uniform broad-based VAT at a level that keeps the general consumer price level constant would require a VAT rate of 19.5 percent on all categories of goods and services other than housing services. Formula (B.4) then implies that the total revenue from the VAT and the excises would increase by about 0.8 percent of total non-housing consumption, corresponding to roughly 0.64 percent of total private consumption, including housing. Measured in 2008 prices, the revenue gain would be about 9.4 billion SEK. Since this gain to the government is obtained without reducing private sector welfare, it is a measure of the total efficiency gain from the move to a uniform VAT.

The explanation for the efficiency gain from the move to a uniform VAT is the following: indirect taxes drive a wedge between the consumer price that reflects the consumer's marginal benefit from the good and the producer price which reflects the marginal cost of producing the good. The tax wedge therefore measures the marginal social gain (the difference between marginal benefit and marginal cost) from an extra unit of consumption and production. The move to a uniform VAT triggers an increase in the consumption and production of goods that were burdened with the highest initial tax wedges, and a fall in consumption and production of the goods where the tax wedges were the lowest. Since the marginal social gain from an increase in consumption and production is greater where the initial tax wedge is higher, this substitution from initially low-taxed to initially high-taxed goods generates a net welfare gain to society.

Note how this estimate of the welfare gain from the VAT reform squares with the analysis in Chapter 4: here as in that chapter the effects of a tax policy change on economic efficiency is given by the impact on the public budget generated by the behavioural responses to the change in tax rates. Nevertheless, our estimate of the gain from a uniform VAT should be taken with a pinch of salt, since formula (B.4) is based on two simplifying assumptions.

First, it assumes that the different goods categories in the current Swedish VAT system are equally substitutable for each

other.[31] This assumption was made because of lack of solid evidence on the actual degrees of substitution between the broad goods categories considered. It is unlikely to hold in practice, but the assumption of identical substitution elasticities does not imply a systematic upward or downward bias in the estimated efficiency gain.

Box 5.2 Estimating the efficiency gain from a move to a uniform Swedish VAT

Suppose there are N different categories of goods and services subject to VAT (including zero-rated and exempt goods), and suppose the representative consumer's utility from consuming these goods is given by the CES goods aggregate

$$C_o = \left[\sum_{n=1}^{N} \beta_n^{1/\sigma_o} x_n^{(\sigma_o - 1)/\sigma_o} \right]^{\frac{\sigma_o}{\sigma_o - 1}}, \qquad \sum_{n=1}^{N} \beta_n = 1, \tag{B.1}$$

where x_n is the consumption of goods in category n, and σ_o is the constant elasticity of substitution between the different goods categories. To maximise their utility, consumers must minimise the expenditure needed to attain any given level of utility. When they do so, the demand for each individual goods category will be given by

$$x_n = \beta_n \left(\frac{p_n}{P_o} \right)^{-\sigma_o} C_o, \qquad p_n = 1 + t^n, \qquad P_o = \left[\sum_{n=1}^{N} \beta_n p_n^{1-\sigma_o} \right]^{\frac{1}{1-\sigma_o}}, \tag{B.2}$$

where t^n is the total indirect tax rate on goods in category n, p_n is the consumer price of those goods (the producer price has been normalized to one), and P_o is the consumer price index for the goods aggregate C_o. The total indirect tax rate on goods of category n is

$$t^n = t_e^n + t_v^n \left(1 + t_e^n \right), \tag{B.3}$$

where t_v^n is the VAT rate, and t_e^n is the excise tax rate in case the goods category in question is also subject to excise taxation.

[31] Technically this is seen by the fact that the utility function (B.1) only includes one single substitution elasticity σ_o.

Box 5.2 cont.
Now consider a VAT reform which equalizes the VAT rates for all goods categories at a level that keeps the consumer price index P_o constant. As shown in Sørensen (2010) the constancy of P_o ensures that the level of consumer utility is unchanged and that consumers will not want to change their labour supply and savings etc. Hence there is no effect on other tax bases than the VAT base. We may now ask how much extra VAT revenue the government will be able to collect from this VAT reform that keeps consumer welfare constant. Sørensen (2010, section 5.3) shows that the answer to this question is given by the equation

$$\frac{dR_o}{P_o C_o} = \underbrace{\sum_{n=1}^{N} \sigma_o \beta_n \overbrace{\left(\frac{p_n}{P_o}\right)^{1-\sigma_o} \left(\frac{-dt^n}{1+t^n}\right)}^{\text{change in consumption of goods category } n} \overbrace{\left(\frac{t^n}{p_n}\right)}^{\text{initial tax rate on goods category } n}}_{\text{dynamic revenue gain from substitution across goods categories}}, \qquad \text{(B.4)}$$

where dR_o is the VAT revenue gain, and dt^n is the change in the total indirect tax rate on goods category n implied by the move to a uniform VAT. In the absence of externalities and other non-tax distortions, t^n represents the difference between the marginal utility of good n and its marginal social cost of production. Hence the dynamic revenue gain from the production and consumption of an additional unit of good n also reflects a net social gain. If there are externalities that have been perfectly internalized through the excise tax rates t_e^n, the total indirect tax rate t^n in (B.4) should be replaced by the initial VAT rate t_v^n to obtain a correct measure of the initial difference between marginal utility and marginal social cost. Equation (B.4) will then give the externality-corrected revenue gain from the move to a uniform VAT. Sørensen (op.cit.) shows how the parameters β_n in (B.4) may be calibrated so that the demand functions in (B.2) reproduce the observed consumption pattern in Sweden in 2008, given the assumed substitution elasticity σ_o.

Second, the economic model underlying formula (B.4) (described in detail in Sørensen (2010)) assumes that all goods and services are

equally substitutable for leisure and that they all have the same income elasticity of demand. With these assumptions the move to a uniform VAT is bound to generate an efficiency gain, since uniform taxation is the optimal policy, as our discussion of the contribution by Sandmo (1974) made clear. It may therefore seem that we have deliberately "stacked the deck" in favour of the proposed VAT reform. This is not necessarily the case, however, even though some goods are in practice closer substitutes for (or complements to) leisure than others. As we explained earlier, the current Swedish VAT system involves reduced VAT rates on certain items (cultural activities, sports events, skilifts etc.) that seem to be complementary to leisure. Raising the VAT rate on such items would tend to stimulate labour supply, thereby generating a further dynamic revenue gain. Our assumption that all goods are equally substitutable for leisure means that this gain is not included in our estimate of the efficiency gain from a uniform VAT. In other words, an analysis based on correct quantitative information on the relationship between the demand for the different consumption goods and the demand for leisure would not necessarily lead to a lower estimated efficiency gain than the one presented here. But since such exact quantitative information is not available, we have based our calculations on the "neutral" benchmark assumption that all goods are equally close substitutes for leisure.

It is also worth noting that we have not accounted for the savings in administrative and compliance costs that would accrue when it is no longer necessary to draw a borderline between goods in different VAT rate categories.

Nonetheless, there is one important reason to believe that the estimated efficiency gain from a uniform VAT mentioned above is too optimistic. The reason is that part of the gain stems from an increase in excise tax revenue as consumers substitute towards goods subject to excises that become cheaper as a result of the cut in the standard VAT rate (recall that all goods subject to excises are currently taxed by the standard 25 percent VAT rate). Excise taxes are often levied to correct for some negative external effect such as pollution. In the ideal case where an excise tax rate correctly reflects the marginal social damage from the negative externality, the rise in excise tax revenue generated by an increased consumption of the taxed good will be exactly offset by the social cost of the additional negative external effects. When calculating

the net social welfare gain from the VAT reform, we should therefore exclude the gain in excise tax revenue if the excises correctly reflect the negative externalities associated with the consumption of certain goods.[32] If we do so, we find that the move to a uniform VAT will only generate an efficiency gain of about 0.3 percent of total private consumption, corresponding to the dynamic VAT revenue gain. In other words, the efficiency gain from a uniform VAT is roughly cut in half if the boost to the consumption of goods currently subject to the standard rate creates additional negative externalities that offset the gain in excise tax revenue. In reality, the efficiency gain probably lies somewhere between the two estimates presented here, since excise taxes are levied not only to "internalize" externalities, but also to generate revenue, so it seems likely that a part of the dynamic excise revenue gain from the VAT reform will reflect a genuine efficiency gain.[33]

Finally, it should be noted again that the VAT reform considered here is very ambitious, involving a complete abolition of all the current exemptions and zero-ratings for all non-housing goods and services, except the usual zero-rating of exports needed to implement the destination principle. As mentioned earlier, some exemptions and zero ratings such as those for financial services and privately provided health and educational services are mandated by EU rules and hence cannot be abolished unilaterally by Sweden. This is another reason why, from a practical perspective, the above analysis may overestimate the potential gain from a Swedish VAT reform. Moreover, even if the EU rules were not a constraint, designing a way of taxing financial services in accordance with VAT principles would be an administrative challenge, even though several authors including Poddar and English (1997) and Crawford, Keen and Smith (2008) have suggested various ways in which this challenge can be overcome.

[32] Technically this means that the total indirect tax rate t^n in formula (B.4) should be replaced by the VAT rate, as we explain in Box 5.2.

[33] Admittedly, this observation is somewhat speculative. If the current excise tax rates on externality-generating goods are in fact far lower than the marginal social costs of the externalities, the dynamic excise revenue gain may actually underestimate the increase in total external costs.

The informal economy: another limit to uniform taxation

A main argument for a uniform VAT was that we lack the reliable detailed information on own-price and cross-price elasticities that would be needed to implement a differentiated indirect tax structure in accordance with optimal tax theory. However, there is at least one area where strict adherence to the principle of uniform taxation is likely to generate significant distortions. This is the area where consumer services delivered from the formal market economy compete directly with do-it-yourself activities by the households themselves or with services delivered from the underground economy. Examples that come to mind are services such as housing repair and repair of other consumer durables, child care, garden care, cleaning and window-cleaning, washing, cooking, snow-clearing etc. Household-related services of this kind ("hushållsnära tjänster" in Swedish) delivered from the formal market economy are often near-perfect substitutes for services that households can produce for themselves. A high direct and indirect tax burden on market services of this type is therefore likely to cause a substantial shift of service production from the formal market economy to do-it-yourself home production and to the underground economy.

The basic problem is that a truly uniform taxation can never be implemented since household production cannot be taxed, and since tax enforcement cannot realistically be 100 percent effective. In these circumstances a uniform tax on those activities that *can* be taxed is likely to cause a particularly large reduction of formal market activity in areas such as household-related services where firms in the formal economy compete most directly with household production and underground production. A tax on market production of these services will not only induce substitution away from work towards leisure; it will also cause substitution from formal (i.e. taxed) market work towards work in the household and work in the underground economy. Because of taxation, work in the informal economy can be privately profitable even if it is much less productive than work in the formal economy.

In Finland and Sweden considerations such as these have led to the introduction of tax breaks for the purchase of household-related services from the formal market. The Swedish tax scheme for "hushållstjänster" was approved by the Riksdag in 2007 and extended in December 2008 to include repair and maintenance of

single-family homes and owner-occupied apartments. The scheme involves an income tax credit for 50 percent of the labour cost component of expenses on a list of household-related services of the kind mentioned above. The maximum credit allowed is 50,000 SEK per person per year. The official goal of the scheme is to stimulate labour supply to the formal market and to replace underground activity with formal market production. The scheme has also been motivated as a way of promoting the equal position of women who currently perform most of the work within households.

Obviously there are several possible ways of reducing the tax burden on household-related services. The Swedish tax credit scheme for these services may be seen as an alternative to a reduced or zero indirect tax rate on such services. As we explain in Box 5.3, modern optimal tax theory does in fact provide a rationale for such a policy, once one allows for the interaction between the formal and the informal economy. The point is that the optimal tax system must minimise the distortionary substitution away from formal *market* activities towards untaxed activities. Taxes should distort the pattern of market activity as little as possible, and this calls for lenient taxation of those market activities that can most easily be replaced by home production (and underground production). These activities would typically include the household-related services covered by the new Swedish tax scheme.

Box 5.3 Optimal indirect taxation with household production

The following simple model may illustrate the case for a reduced tax rate on market services that compete directly with home production. The model is a special case of the one set up in Kleven, Richter and Sørensen (2000) who in turn built on the earlier work of Sandmo (1990). Suppose the representative consumer produces services within the household (S^h) subject to the concave household production function

$$S^h = h(H), \qquad h' > 0, \quad h'' < 0, \tag{B.5}$$

where H denotes hours spent working in the home. Suppose further that services can also be purchased in the market place so that total service consumption (S) is the sum of services bought in the market (S^m) and services produced at home:

Box 5.3 cont.

$$S = S^m + S^h. \tag{B.6}$$

If the consumer spends L hours working in the market and his total time endowment is $E=1$, his consumption of leisure (ℓ) will be

$$\ell = 1 - L - H. \tag{B.7}$$

Apart from leisure and services, the consumer also consumes "goods" (G). For concreteness, let utility be given by

$$U = \ell^{\alpha}\left(G^{\beta}S^{1-\beta}\right)^{1-\alpha}, \qquad 0<\alpha<1, \qquad 0<\beta<1. \tag{B.8}$$

These preferences are weakly separable in leisure and commodities (G and S are equally substitutable for ℓ), and the sub-utility function $G^{\beta}S^{1-\beta}$ is homothetic (implying identical income elasticities of demand for G and S). As mentioned earlier, with such preferences uniform commodity taxation would be optimal in the absence of home production. Without loss of generality we may assume that it takes one unit of market work to produce one unit of each of the two commodities G and S. Choosing leisure as the numeraire good (i.e. normalising the net wage rate w at unity) and assuming that labour is the only factor of production, the producer prices of G and S will then both be equal to one. With t_G and t_S denoting the unit commodity taxes imposed on G and S, respectively, the consumer's budget constraint therefore becomes

$$P_G G + P_S S^m = L, \qquad P_G = 1 + t_G, \qquad P_S = 1 + t_S, \tag{B.9}$$

where P_G and P_S are consumer prices, and L $(=wL)$ is the consumer's market income. The consumer maximises utility (B.8) subject to the budget constraint (B.9). As shown by Sørensen (2009), the solution to this problem implies among other things that

$$P_S h'(H) = 1 \quad \Rightarrow \quad H = H(t_S), \qquad H' = -\tfrac{h'}{P_S h''} > 0. \tag{B.10}$$

Box 5.3 cont.
According to (B.10) the consumer engages in home production until the resulting marginal saving on services bought in the market, $P_S h'(H)$, equals the marginal opportunity cost of working at home rather than in the market $(=w=1)$. Since $P_S = 1+t_S$, we see that this behaviour implies that the time spent on home production rises with the tax rate imposed on services delivered from the market.

The government's revenue (R) from the taxation of the two market goods is

$$R = t_G G + t_S S^m = t_G G + t_S \left(S - S^h\right). \quad \text{(B.11)}$$

Consider now an initial situation with uniform taxation where $t_G = t_S$. From such a starting point Sørensen (2009) shows that the government can increase welfare by moving towards a situation where $t_G > t_S$, that is, by differentiating indirect taxation in favour of household-related services. Specifically, Sørensen demonstrates that an indirect tax reform which raises t_G and lowers t_S in a way that maintains constant utility will have the following impact on public revenue, where t is the initial uniform indirect tax rate:

$$dR = -\left(\frac{t}{1+t}\right)\left[\alpha S^h + H'(t_S)\right]\cdot dt_S > 0 \quad \text{for} \quad dt_S < 0. \quad \text{(B.12)}$$

Thus the government's revenue increases, enabling it to raise consumer welfare by recycling the extra revenue. There are two reasons for the rise in revenue. First, even if home production were unchanged, the fall in t_S reduces the revenue loss caused by the fact that services produced in the home cannot be taxed. This effect is captured by the first term in the square bracket in (B.12). In addition, the fall in t_S induces consumers to substitute market-produced services for home production, thereby increasing the tax base. This is captured by the last term in the square bracket in (B.12). Note that in the absence of home production we would have $S^h = H' = 0$, so in that case there would be no revenue gain and hence no welfare gain by deviating from uniform taxation, according to (B.12). Absent

Box 5.3 cont.
home production, our model thus reproduces the standard result that uniform commodity taxation is optimal when preferences are separable in leisure and commodities and utility is homothetic in commodities. But once home production is allowed for, it follows from our analysis that commodities which can be produced at home as well as in the market economy should be taxed more lightly than commodities that cannot be produced within the household. Kleven, Richter and Sørensen (2000) show that this conclusion will almost surely hold also when preferences are not separable and homothetic.

However, although a reduced tax burden on household-related services can be defended on theoretical grounds, the new Swedish tax scheme is not without problems. The scheme only provides a tax break for the labour cost component of expenses on household-related services. This will tend to distort the use of inputs in the production of such services, by favouring the use of labour. On the other hand, since the more labour-intensive services are probably the closest substitutes for do-it-yourself activities, it may be that this distortion of the input composition in the market sector helps to reduce the tax-induced distortion in favour of home production.

A potentially more serious problem is that of drawing a line between services eligible for the tax credit and services that are not eligible. Such line-drawing always creates administrative difficulties and may also open the door to lobbying and tax-driven product innovation, as we discussed earlier.

In summary, the arguments for a broad-based, uniform VAT are strong, so uniformity should be the general guiding principle of value-added taxation for all the reasons discussed above. Deviations from uniformity should be accepted only in those areas where the taxed activities compete most directly with closely substitutable activities that cannot be taxed, that is, in areas where a tax break can alleviate an obvious and quantitatively significant distortion. Household-related services is one of the few such areas where a case for lenient taxation seems to exist. But even when such a case can be made, it may be better to implement a tax break through more transparent instruments such as a tax credit or a direct

subsidy rather than complicating the VAT system by deviations from rate uniformity.

5.3 Excise taxes

The role of excise taxes

In Chapter 3 we saw that Sweden has followed the general international trend towards a lower share of excise tax revenue in total tax revenue. Yet excises still account for almost 8 percent of total Swedish tax revenue, as reported in Table 5.1. The bulk of the excise tax revenue comes from the traditional "sin" taxes on tobacco and alcohol and from taxes on energy, carbon and motor vehicles.

Table 5.1 Excise taxes in Sweden, 2008[1]

Excise tax on	Revenue (billion SEK)	Percent of total tax revenue	Percent of GDP
Tobacco	10	0.7	0.3
Spirits	4	0.3	0.1
Wine	4	0.3	0.1
Beer	3	0.2	0.1
Energy	39	2.6	1.2
Carbon	26	1.7	0.8
Other environmental taxes	5	0.3	0.2
Motor vehicles	16	1.1	0.5
Other excises	6	0.4	0.2
Total	**113**	**7.6**	**3.6**

[1.] Rounded numbers.
Source: Ministry of Finance, Stockholm

By nature excise taxes are specific taxes levied on particular commodities, so the use of excises is a way of implementing differentiated indirect taxation, as an alternative to differentiated VAT rates. Our previous discussion of optimal tax theory suggested that when the government can freely deploy a progressive personal income tax, the only rationale for VAT rate differentiation is that a properly designed differentiated VAT could help to offset the negative effect of the income tax on labour

supply. We then went on to argue that, for a number of pragmatic reasons which include the lack of knowledge of the relevant cross-price elasticities, a uniform VAT is in practice preferable. However, this discussion ignored the existence of negative external effects from many forms of consumption and production, e.g., pollution. The case for using specific taxes to "internalize" externalities (i.e. to confront the agents causing an externality with its social cost) was forcefully made already by Pigou (1920) and has been elaborated in the modern literature on optimal taxation in the presence of externalities. In the many cases where externalities are caused by the activities of firms as well as households, a differentiated VAT will often be an ineffective instrument for internalizing externalities, since the crediting of input VAT against output VAT means that the use of polluting inputs by VAT-registered entities cannot be taxed via the VAT system. A proper correction for externalities therefore requires the use of excises.

Further, in a country like Sweden with a need for high public revenue, there may also be a case for supplementing the revenues from the income taxes and the VAT by excise tax revenue to hold down the VAT rate and the marginal income tax rates, since the temptation for tax evasion may be particularly high when the (marginal) tax rate becomes very high. Indeed, historically the excises were in large part introduced as a way of raising revenue, although they have increasingly come to be seen as key instruments for internalizing externalities.

Box 5.4 explains some basic principles of optimal commodity taxation when indirect taxes serve the role of raising revenue as well as correcting for externalities. The optimal indirect tax rate then becomes the sum of a "Ramsey term" calling for a relatively tax on a good that is inelastic in demand and a "Pigovian term" which equals the marginal social cost of the externality created by consumption of the good. One important point made in the box is that the best way of internalizing an externality through the tax system is to impose a tax directly on the externality-generating good at a rate reflecting the full social cost of the externality. When this principle is adhered to, there is no case for countering externalities by imposing a relatively high (low) tax on goods that are complementary to (substitutable for) the externality-creating good.

Our earlier arguments in favour of uniform indirect taxation when externalities are absent suggests that the need for revenue

from indirect taxation is best accommodated through a uniform VAT and that excise taxes should be used solely to correct for externalities. But if excises are also imposed in part because they are an administratively convenient way of collecting revenue, the government might as well exploit whatever solid information on the price elasticities of demand might be available, in order to minimise the distortions from the excises (this is the message from the "Ramsey term" in formula (B.17)). In our discussion of the various excises, we will keep this point in mind.

Box 5.4 Optimal indirect taxation with externalities: Ramsey meets Pigou

What determines the structure of optimal indirect tax rates when the government not only needs to raise a certain amount of revenue from indirect taxes, but also wishes to use them to correct for externalities? A classical contribution addressing this issue was made by Sandmo (1975). He considered an economy with heterogeneous consumers and made no special assumptions on consumer preferences. However, the following highly simplified model may be used to illustrate one of Sandmo's main points regarding optimal taxation in the presence of externalities. Consider an economy inhabited by n identical consumers each of whom has the utility function

$$U = \frac{x_1^{1-1/\varepsilon_1}}{1-1/\varepsilon_1} + \frac{x_2^{1-1/\varepsilon_2}}{1-1/\varepsilon_2} - L - \beta X_2, \qquad X_2 \equiv n x_2, \qquad \varepsilon_1 > 1, \qquad \varepsilon_2 > 1, \qquad \beta > 0, \tag{B.13}$$

where x_1 is the consumption of the "clean" good 1, x_2 is consumption of the "dirty" good 2, L is the number of hours worked, and x_2 is the aggregate consumption of the dirty good which generates a negative external effect on the welfare of all consumers, say, due to pollution. The marginal social damage from pollution (measured in utility terms) is given by the parameter β. For convenience, we normalize the net wage rate (w) to unity so that $L=wL$ is the consumer's total labour income. The representative consumer's budget constraint may then be written as

$$p_1 x_1 + p_2 x_2 = L, \qquad p_1 = q_1 + t_1, \qquad p_2 = q_2 + t_2. \tag{B.14}$$

Box 5.4 cont.
The variables p_i and q_i are the consumer price and the producer price of good i, and t_i is the specific excise tax on that good. Since the number of consumers (n) is large, each individual consumer only has a negligible impact on the aggregate consumption of the polluting good (X_2). When choosing his/her labour supply and consumption of the two goods so as to maximise utility, the individual consumer therefore takes the amount of pollution as given, thus neglecting that his own consumption of the dirty good contributes (a little bit) to pollution. Hence there is a negative external effect of the individual consumer's consumption of the dirty good. The representative consumer's utility-maximising behaviour can be shown to imply that the demand for the two goods and the supply of labour is given by

$$x_1 = p_1^{-\varepsilon_1}, \qquad x_2 = p_2^{-\varepsilon_2}, \qquad L = p_1^{1-\varepsilon_1} + p_2^{1-\varepsilon_2}. \quad \text{(B.15)}$$

Thus the parameters ε_1 and ε_2 are the price elasticities of demand for the two goods. The government's revenue (R) from indirect taxes is

$$R = t_1 x_1 + t_2 x_2. \quad \text{(B.16)}$$

When the government needs to raise a certain amount of revenue from indirect taxes, the optimal tax rates in this simple economy can be shown to be

$$\frac{t_1}{p_1} = \frac{\mu - 1}{\mu} \cdot \frac{1}{\varepsilon_1}, \qquad \frac{t_2}{p_2} = \overbrace{\frac{\mu - 1}{\mu} \cdot \frac{1}{\varepsilon_2}}^{\text{Ramsey tax}} + \overbrace{\frac{MEC}{p_2}}^{\text{Pigou tax}}, \qquad MEC \equiv \frac{n\beta}{\mu}. \quad \text{(B.17)}$$

The variable μ is the shadow price of public revenue, i.e., the drop in consumer welfare occurring if the government needs to raise an additional krona of revenue (since taxes generate a deadweight loss, we have $\mu > 1$). From (B.17) we see that the optimal ad valorem tax rate on the polluting good is the sum of two components. The first one is a "Ramsey" term which is proportional to the inverse price elasticity of demand for the dirty good, in accordance with Ramsey's inverse elasticity rule

Box 5.4 cont.
which is also seen to govern the optimal tax rate on the "clean" good 1. The labour supply function in (B.15) shows that if the price elasticities of demand for the two goods differ, the government can minimise the negative impact of taxation on labour supply by setting a relatively high (low) tax rate on the less (more) price-elastic good, as we explained in Section 5.2. The second component of the tax on the dirty good is a "Pigovian" term that serves to confront consumers with the external cost of consuming an additional unit of that good. The magnitude $MEC = n\beta / \mu$ is the marginal external cost of pollution measured in monetary terms, that is, the marginal welfare loss from pollution arising when the representative consumer increases his/her consumption of the dirty good by one unit. By imposing an additional tax equal to *MEC*, the government ensures that the individual consumer fully internalizes the marginal external social cost generated by consumption of the dirty good. Note that the Pigovian tax term enters additively in the formula for the optimal tax on the dirty good. Sandmo (1975) showed that this additivity property also holds in the general case where the consumption of each good depends not only on its own price, but also on the price of all other goods. Sandmo also found that even in this case, the government should not try to curb pollution by imposing a relatively high (low) tax on goods that are complementary to (substitutable for) the dirty good. In other words, indirect taxes aimed at internalizing externalities should be levied only on the externality-generating goods.
The analysis above assumes that a given amount of revenue has to be collected via indirect taxes, independently of the revenue raised through the personal income tax. Pirtillä and Tuomala (1997) showed that when indirect taxes can be optimally coordinated with a progressive personal income tax, the optimal indirect tax rate on externality-creating goods still consists of the sum of a Ramsey-type component and a Pigovian term. Pirtillä and Tuomala also found that when the welfare effect of the externality enters additively in consumer utility functions – as in our utility function (B.13) – the Pigovian term in the optimal indirect tax rate should still correspond exactly to the marginal social cost of the externality.

The "sin" taxes

The traditional "sin" taxes on tobacco and alcohol have accounted for a falling share of tax revenue over time, in part because of a low income elasticity of demand for these products, and partly because the need to reduce socially wasteful cross-border shopping has forced some reductions in excise tax rates in recent years, as described in Chapter 3. Today the excises on tobacco, spirits, wine and beer generate a little less than 20 percent of total excise tax revenue and about 1.5 percent of total tax revenue.

From the viewpoint of conventional economic theory the main case for the "sin" taxes is that they serve to internalize the negative external effects caused by the consumption of tobacco and alcohol such as the costs of passive smoking and the harm that drunken drivers cause to others, etc. An important part of the externalities is the collectively-borne resource costs of publicly funded medical treatment for smoking- and alcohol-related health problems, including the deadweight loss from the taxes needed to finance public health care.

In recent years several authors including Gruber (2007) have emphasized that standard economic models assuming fully rational forward-looking behaviour may not be well suited for a normative analysis of optimal taxation of items such as tobacco and alcohol. These authors stress the fact that consumption of tobacco and alcohol often starts at a very young age where consumers may not fully appreciate the potential long-term addiction problems caused by excessive consumption. The critics of the traditional approach to optimal taxation of tobacco and alcohol also point to extensive evidence suggesting that adults often act in a so-called time-inconsistent manner: even if they may be fully able to make a rational long-term plan for curbing their (excessive) consumption of tobacco and alcohol, they may lack the self-control to carry out the plan. Hence these consumers may welcome a government-imposed incentive such as a high excise tax rate which increases the reward for sticking to the plan they are trying to follow. Authors such as O'Donoghue and Rabin (2006) who have tried to analyse optimal taxation in the presence of self-control problems typically find that optimal sin taxes can be much higher than the tax rates suggested by most existing estimates of the negative externalities caused by tobacco and alcohol consumption.

Obesity – widely believed to stem from excessive consumption of unhealthy food and beverages - is becoming a growing problem in many countries. Obesity may cause "fiscal" externalities by requiring publicly funded health care for the obese, and it may also reflect a lack of consumer self-control. These observations have started a debate on whether excise taxes on unhealthy food items or "unhealthy" inputs in food production could help to counter obesity. The recent Danish tax reform of 2010 includes a new excise tax on saturated fat in certain food items, expected to raise a revenue of about 1 billion DKK. This new excise is controversial, however, as some health experts have criticized it for being poorly targeted at the substances most likely to generate obesity. Designing the new excise has also raised difficult line-drawing problems about what kinds of products and inputs to tax, and the tax may involve significant compliance costs as firms will have to document the content of saturated fat in their products.

More generally, there are serious obstacles to implementing a rational system of excises to combat obesity, as Gruber (2007) points out. First, while excessive consumption of certain food items could cause obesity, an insufficient level of consumption of some items (caused by a high excise tax) might cause other health problems. Second, there are still considerable scientific uncertainties about the links between food consumption and obesity. Third, it is difficult to predict the nature and health implications of the substitution patterns in the production and consumption of food that could be triggered by "obesity taxes". For example, if producers and consumers were to substitute from fats to sugars when the former is taxed, what would be the net effect on health? Difficulties such as these call for a cautious approach to obesity taxes and suggest the need for careful preparatory analysis before any such taxes are introduced.

Research on optimal sin taxes is still in its infancy, facing difficult questions about the best way of modelling consumer behaviour and public policy objectives when consumers have self-control problems. However, on the basis of the recent literature it seems hard to argue that the current Swedish excises on tobacco and alcohol should be cut, even though they are quite high in an international context. On the other hand, significant increases in the traditional Swedish sin taxes would probably trigger a substantial increase in cross-border shopping by Swedish consumers in the neighbouring countries of Denmark, Germany,

and the Baltic countries where excises are generally lower. A marked increase in cross-border shopping would tend to defeat the purpose of higher excises, be it a higher revenue or a better prevention of health problems etc.

In summary, there does not seem to be a strong case for significant changes in the current Swedish taxes on tobacco and alcohol.

The carbon tax

Sweden was one of the countries to pioneer the introduction of a carbon tax in the early 1990s, and the Swedish carbon tax has been raised and modified on several occasions since then. The tax is levied on the carbon content of fossil fuels used as propellants or for heating purposes. The standard carbon tax rate is currently 1.05 SEK per kilo, but for industries included in the EU Emissions Trading Scheme (ETS) for carbon emission permits the tax rate is reduced to 15 percent of the standard rate, and for agricultural, forestry and manufacturing firms not included in the ETS the carbon tax rate is reduced to 21 percent of the standard rate.

The carbon tax is seen as an important instrument (although not the only one) in the implementation of Sweden's climate and energy policies. The announced main goals of these policies are that 1) the greenhouse gas emissions from the part of the economy not covered by the ETS should be reduced by 40 percent between 1990 and 2020; 2) the share of renewable energy sources in total energy use should increase from 39.8 percent in 2005 to 50 percent in 2020, and 3) total energy use per unit of GDP should be reduced by 20 percent from 2008 to 2020. The first two goals are more ambitious than the targets for Sweden implied by the country's obligations towards the EU (see Finansdepartementet (2009)). For the sectors covered by the ETS, the EU has committed itself to reduce emissions for the EU as a whole by 20 percent between 1990 and 2020, although the EU has declared its willingness to raise this target to 30 percent if a successful global climate agreement can be reached.

The instrument for implementing the greenhouse gas emissions reduction for the ETS sector will be a gradual reduction in the issue of carbon permits, administered by the EU Commission. The rationale for the European ETS scheme is that it establishes a

common "price" of carbon given by the price of the tradeable carbon permits. In principle, a common carbon price ensures that emissions reductions are concentrated in firms and countries where greenhouse gas abatement is the cheapest. Firms with a marginal abatement cost below the permit price will find it profitable to undertake abatement and sell (some of) their allotted carbon permits in the market, while firms with a marginal abatement cost exceeding the permit price will buy additional permits. This process will tend to equalize marginal abatement costs across firms and countries so that the total costs of emissions reductions for the ETS sector as a whole will be minimised.

However, firms in the ETS sector also pay national energy taxes on fossil fuels that differ across EU member states, and in some countries like Sweden and Denmark they pay a carbon tax. These national taxes tend to prevent the cross-country equalization of the carbon price which the ETS scheme was intended to achieve. The Swedish carbon tax on the ETS sector raises the price of carbon for Swedish firms in the sector, thereby reducing their demand for fossil fuels and carbon permits, but it does not reduce total emissions from ETS sector in the EU, since this is determined by the total issue of permits allowed by the EU Commission. By curbing the demand for emission permits, national carbon taxes on the ETS sector will just reduce the permit price so that total demand continues to equal the given supply.

The Swedish carbon tax on the ETS sector thus seems irrelevant for achieving any EU or Swedish climate policy goal. From an EU perspective the Swedish tax may nevertheless be useful if it brings the price of carbon in the Swedish ETS sector closer to the average EU carbon price implied by the coexistence of the ETS with national energy and carbon taxes. However, from a national Swedish perspective the marginal social benefit of greenhouse gas abatement in the ETS sector is given by the permit price, since this price determines the increase in Swedish national income (gross of abatement costs) accruing when Swedish firms in the sector reduce their emissions. A maximisation of Swedish national income would thus require an abolition of the carbon tax on the ETS sector, since firms in the sector would then undertake abatement up to the point where their marginal abatement cost equals the permit price that reflects the marginal social benefit from abatement. From the national perspective it therefore seems well motivated that the

Swedish government is planning to eliminate most of the carbon taxes on firms in the ETS sector from 2011.

On the other hand, the Swedish carbon tax may be a highly relevant instrument for reducing greenhouse gas emissions from emitters outside the ETS sector. A common carbon tax rate for all non-ETS emitters would minimise the total cost of achieving a given abatement target for the non-ETS sector by tending to equalize marginal abatement costs across all emitters in the sector. Ideally, the carbon tax rate on the non-ETS sector should correspond to the (average) price of carbon permits in the ETS sector, since this would minimise the total cost of reducing greenhouse gas emissions from Swedish territory by bringing about a (rough) equalization of marginal abatement costs across the whole economy. However, a carbon tax rate in line with the carbon permit price may not be sufficient to attain the ambitious Swedish target for the reduction of emissions from the non-ETS sector. For Sweden as well as for other EU member states, it would be a great advantage if the EU-mandated national target for emissions reductions in the non-ETS sector could be met either by cutting emissions from national territory or by buying carbon permits in the ETS market and handing them in to the EU Commission (so that the permits are withdrawn from the market). The Swedish government could then set a carbon tax rate for the non-ETS sector equal to the permit price and purchase an amount of permits equal to the difference between the national emissions reduction target and the actual emissions reduction attained in the non-ETS sector. This policy would ensure a minimisation of the total cost of implementing Sweden's contribution to the reduction of global greenhouse gas emissions. If other EU countries followed a similar policy, a common carbon price would be established across all economic sectors throughout the EU, ensuring a cost-effective abatement effort in each member state as well as in the EU as a whole. The potential cost savings from such a liberal scheme for intra-EU trade in carbon permits could be substantial, thereby allowing more ambitious targets for emissions reductions and strengthening the position of the EU in international negotiations on a global climate agreement.

Unfortunately, however, EU policy makers have so far determined that the national emissions reduction targets for the non-ETS sector should primarily be implemented through reduction of each country's emissions from national territory, with

only a limited role for trade in carbon permits. Hence the attainment of the ambitious Swedish target of a 40 percent cut in emissions from the non-ETS sector between 1990 and 2020 may require a carbon tax rate significantly above the price of carbon permits in the ETS scheme.[34]

The prospect of a high Swedish carbon tax rate on firms outside the ETS sector raises the issue whether firms exposed to international competition should pay the higher tax. Currently agricultural and manufacturing firms not included in the ETS already benefit from a reduced carbon tax rate of only 21 percent of the standard rate. This reduction has been motivated by a desire to protect the competitive position of Swedish firms. However, by driving a wedge between the marginal abatement costs of different emitters in the non-ETS sector, a reduced carbon tax rate for some firms in the sector increases the total cost of achieving the reduction target for the sector as a whole.

A reduced carbon tax rate for emitters particularly exposed to foreign competition is often defended by referring to the risk of "carbon leakage": a high domestic carbon tax may induce firms to shift production to other countries without a carbon tax (or with a lower tax) so that no reduction in global greenhouse gas emissions is achieved. From a global perspective this is certainly a relevant point that underscores the need for a global coordination of climate policies. But the fact remains that if Sweden is firmly committed to a certain reduction in total national emissions from the non-ETS sector *regardless* of the policies pursued abroad, differentiated carbon tax rates within the sector increase the cost of attaining the target. And if Sweden wishes to set a good example by being a persistent front-runner that always adopts more ambitious abatement targets than (most) other countries, the logical implication is that carbon-intensive production should be more costly in Sweden than elsewhere. In the long run, the resources of labour, capital and land released from the carbon-intensive production that is shifted to foreign locations will be absorbed by other domestic production sectors, so Sweden will come to specialize in "cleaner" modes of production.

[34] The Swedish target does, however, allow for the possibility of financing emissions reductions abroad as an alternative to reducing domestic emissions. Specifically, it is envisaged that 1/3 of the 40 percent emissions reduction could be achieved abroad, e.g. by using the so-called Clean Development Mechanism introduced by the Kyoto Protocol.

It might be objected that since isolated Swedish efforts to cut greenhouse gas emissions have very little impact on global emissions, it is unfair if the cost of attaining an ambitious national abatement target is borne disproportionately by a few carbon-intensive industries and their employees. It is certainly true that the burden of many "green" taxes such as a carbon tax tends to be unevenly distributed. However, this is not an argument for adopting a cost-ineffective method of pollution abatement such as a differentiated carbon tax when other and more efficient methods of compensating the losers from a uniform carbon tax are available. For example, instead of adopting a reduced carbon tax rate for industries exposed to international competition, the government could use (part of) the additional revenue from a uniform carbon tax to finance active labour market programs that help workers previously employed in carbon-intensive industries to find employment elsewhere.

Against this background, a case for a reduced carbon tax rate on industries subject to international competition can be made only if there are good reasons to believe that (most) other countries will soon follow in Sweden's footsteps by adopting more ambitious climate policies involving substantial carbon taxes or other forms of regulation with a similar effect on the price of carbon. In that case a temporarily reduced carbon tax rate for Swedish manufacturing firms – maintained only until the climate policies in other countries are tightened - could avoid the adjustment costs that would arise if some Swedish firms temporarily relocated their production to other countries to take advantage of a temporarily lower carbon price abroad. On the other hand, a reduced carbon tax rate for a substantial part of the Swedish non-ETS sector may also defer the adoption of more ambitious climate policies in Sweden's trading partner countries.

The Swedish government has announced plans to gradually raise the carbon tax rates on the industries in the non-ETS sector currently benefiting from a reduced tax rate. At the same time the plan is to reduce the carbon tax rate on the ETS sector (see Finansdepartementet (2009)). As indicated by the analysis above, these policy plans seem well motivated and could be pursued even more consistently.

At the EU level concerns about the competitive position of EU producers vis á vis competitors outside the EU have motivated the current policy of "grandfathering" whereby firms in the ETS sector

are granted almost all of their initial allotments of carbon pollution permits for free. Unfortunately this policy is very inefficient compared to an allocation of permits by auctioning to the highest bidders. Even if permits are initially allotted free of charge, the ETS still raises the marginal costs of production for firms in the sector because additional output requires additional costly carbon permits which have to be bought in the permit market, or, if already held, could otherwise have been sold. Since output prices reflect marginal costs, the current policy of grandfathering does not achieve its stated goal of maintaining the competitiveness of EU producers in global markets, and at the same time it imposes a revenue loss on governments in the EU, compared to a policy of allotting carbon emission permits via auctions. Grandfathering of permits essentially amounts to a hand-out of rents to firms in the ETS sector, since their output prices go up whereas their average (as opposed to marginal) costs are little affected. These rents could alternatively have been captured by member state governments through auctioning with little or no distortionary effect on industry. Against this background, it is most welcome that EU policy makers have declared their intention to move gradually (from 2013) towards allotment of carbon permits mainly by auctioning rather than grandfathering. It would be desirable if this policy could be implemented faster and more consistently than the current plans imply.

Taxes on energy

Taxes on energy are the most important form of excise tax in Sweden, contributing more than a third of total excise tax revenue. The energy taxes include taxes on gasoline, diesel, gasoil, coal, and electricity. The EU Energy Tax Directive requires member states to impose certain minimum tax rates, but for several sectors these minimum rates are zero. In Sweden energy tax rates are zero for firms in agriculture, forestry and manufacturing and for producers of hydro power. Bio fuels are also typically exempt from energy tax.

The proper design of energy taxes depends very much on their purpose. If the purpose is simply to raise revenue, economic theory prescribes that energy taxes should be levied only on final consumers in the household sector. Imposing taxes on the use of

energy in production rather than collecting the tax at the stage of final consumption is inefficient, since it distorts the input use of firms, inducing them to substitute away from the use of energy in a manner that lowers productivity. Taxing inputs rather than outputs reduces the total "size of the pie" available to society and is therefore inefficient. This is an application of the important Production Efficiency Theorem originally derived by Diamond and Mirrlees (1971). From a pure revenue-raising perspective the current policy of exempting most firms from energy tax is therefore well-motivated. Indeed, to preserve production efficiency the service sector firms currently subject to taxes on their energy use should also be exempted.

However, if the purpose of energy taxes is to internalize externalities, they should be levied at equal rates on all externality-creating economic units, be they firms or households. Exempting firms in this case would be cost-inefficient since firms would then face a lower marginal cost of reducing the externality than households. As explained earlier, minimisation of the total cost of attaining a given level of pollution abatement requires an equalization of marginal abatement costs across all externality-generating units in the economy, and this in turn requires that all units are charged the same tax-price for generating the external effect.

When energy taxes are deployed to correct for externalities, the tax rates should reflect the estimated marginal social cost of the externalities caused by the use of the different energy forms. The use of fossil fuels generates a global externality in the form of carbon emissions which may be internalized by means of a carbon tax, as discussed above. But the use of fossil fuels may also cause more local externalities such as air pollution which may justify an additional energy tax (i.e. a tax that is not related to the carbon content) on top of the carbon tax. Moreover, even if bio fuels do not contribute to the greenhouse effect, some amount of tax on these fuels may be warranted in so far as they create local externalities.

In line with the goal declared by the European Council in 2007, the Swedish government has announced the target of increasing "energy effectiveness" (reducing energy use per unit of GDP) by 20 percent by 2020. It is not clear what ultimate goal this target for energy use is supposed to achieve. If all externalities associated with energy use have been properly internalized by the taxes on

energy and carbon, attempts to discourage the use of energy even further would reduce the productivity of the Swedish economy. Indeed, if the externality problem has already been addressed via taxes or other forms of regulation, there is no economic rationale for implementing further regulation or taxation to enforce savings on the use of a particular input such as energy. However, if Swedish policy makers are nevertheless firmly committed to a separate goal of energy saving in addition to the goal of internalizing environmental externalities, they are effectively saying that energy use involves an additional social cost besides the cost of pollution. This social cost could then motivate an additional layer of energy tax on top of the taxes aimed at internalizing global and local environmental externalities. To serve its purpose of reducing energy use in whatever form, such an "energy savings tax" should be levied on all firms as well as households in proportion to a common measure of the units of energy extracted from the different energy raw materials. Exempting some sectors and/or some forms of energy from an "energy savings tax" would imply that the aggregate energy savings target would not be attained in a cost-effective manner.

On the other hand, the separate policy goal that the share of renewable energy sources in total energy use should increase to 50 percent in 2020 would seem to call for reduced tax rates on (or possibly even subsidies to) renewable energy. Just as the separate target for energy savings lacks an economic rationale, it is hard to see the rationale for a separate target for the share of renewable energy if all externality problems have already been properly addressed through corrective taxes on polluting energy sources. When Pigovian taxes reflecting the full marginal social cost of global and local externalities are imposed, they already provide the appropriate incentive to expand the use of "clean" sources of energy. Enforcing a separate target for the use of renewable energy in the presence of Pigovian taxes will drive a wedge between the marginal cost of renewable energy and the marginal social cost of the use of fossil fuels. Hence a separate target for renewable energy will fail to minimise the total social cost of energy use.

As this discussion indicates, designing an appropriate system of energy taxes is a complex matter when there are many competing policy goals, but the guidelines for energy tax policy suggested by economic reasoning may be summed up as follows. Energy taxes collected purely for revenue purposes should be levied only on

households and should be concentrated on those energy products that are most inelastic in demand in order to minimise the deadweight loss. Energy taxes aimed at internalizing externalities should be levied on firms as well as households and should reflect the marginal social costs created by the externalities. A separate target for energy savings lacks an economic rationale, but if it is maintained, it calls for an additional "energy savings tax" levied on all firms and households in proportion to all of their energy use in whatever form. A separate target for the share of renewable energy surces in total energy use likewise lacks a clear economic rationale when externalities can be fully corrected through Pigovian taxes on carbon and energy. If such a target is nevertheless maintained, there is a case for reduced (possibly zero or even negative) energy tax rates on renewable energy sources.

Taxation of road transport

The taxes on carbon and energy include taxes on gasoline and diesel that fall on road transport. In addition, households and firms in Sweden pay annual taxes on motor vehicles amounting to 16 billion SEK in 2008, equivalent to about 14 percent of total excise tax revenue. Besides greenhouse gas emissions and local air pollution, road traffic generates a number of other externalities such as noise, congestion, traffic accidents etc. Some of these external effects, particularly congestion, vary greatly with the location and time of the day where the traffic occurs. Hence these externalities cannot be properly internalized by general fuel taxes which are independent of the time and place of the transport.

The marginal social damage caused by congestion and noise externalities could be internalized through a system of road pricing where drivers are charged according to the distance driven, location and time. Since 2006 the city of Stockholm has actually operated a congestion pricing system, the Stockholm congestion tax. The city centre is within the congestion tax zone. All entrances to and exits from this area have unmanned control points operating with automatic number plate recognition. All vehicles entering or exiting the congestion tax zone have to pay 10-20 SEK depending on the time of day between 6:30 and 18:29. The maximum tax per vehicle per day is 60 SEK and payment is made by various means

within 14 days after the vehicle has passed one of the control points.

The Stockholm congestion tax can be seen as a first step towards a more sophisticated road pricing system where tax rates are more finely differentiated according to location and time, based on traffic studies. Such fine-tuning of road prices involves a trade-off, for while it leads to a more correct pricing of the externalities, it also implies higher operating costs and may not achieve the intended incentive effects if the structure of road prices is too complex to be well understood by motorists.

The technology needed to operate a sophisticated system of road-pricing is still in its infancy, and the spread of road-pricing has so far been hampered by high operating costs. However, as growing traffic volumes exacerbate congestion problems and as the necessary technology improves, advanced road pricing systems in city areas will become an increasingly attractive and superior alternative to the traditional taxes on vehicles and fuels. As a pioneer in the implementation of a congestion tax, Sweden should be in a good position the expand the use of road pricing as the needed technology becomes cheaper and congestion problems intensify.

Green tax reform: is there a double dividend?

In recent decades it has become increasingly accepted that "green" taxes on polluting activities can be a cost-effective way of achieving environmental policy goals. In particular, a uniform carbon tax is an efficient way of setting a price on carbon since the greenhouse effect of carbon emissions is a truly global externality that is independent of the source and location of the emission.

A more controversial issue has been the so-called double dividend hypothesis which claims that in addition to the benefits from an improved environment, a green tax reform where the increased revenue from green taxes is used to finance cuts in other taxes yields an additional non-environmental benefit (a "second dividend") by reducing tax distortions in, say, the labour market. In its popular version, the double dividend hypothesis thus says that a green tax reform creates a better environment as well as higher employment. If there is indeed a second dividend from a green tax reform, it suggests that taxes on polluting activities

should be set *above* the Pigovian level reflecting the external cost of pollution, i.e., that the shift from other taxes towards green taxes ("skatteväxling" in Swedish) should be carried further than warranted by purely environmental concerns.

The double dividend hypothesis has been popular among environmentalists because it seems to strengthen the case for curbing pollution through the tax system. Unfortunately, however, economic research during the last two decades has revealed that the double dividend hypothesis is not generally true, as illustrated by the simple model in Box 5.5.

Box 5.5 Is there a double dividend from a "green" tax reform?

Could a "green" tax reform generate a welfare gain from increased employment in addition to the gain from an improved environment? This issue may be illuminated by a slightly modified version of the simple model set up in Box 5.4. We maintain the normalization that the wage rate is equal to one, but in addition to the two excise taxes we now introduce a proportional labour income tax levied at the rate τ so that the after-tax wage rate is $1-\tau$. The consumer budget constraint (B.14) then modifies to

$$p_1 x_1 + p_2 x_2 = (1-\tau)L, \qquad p_1 = q_1 + t_1, \qquad p_2 = q_2 + t_2. \quad \text{(B.18)}$$

Denoting the marginal utility of income by λ, we find that maximisation of the representative consumer's utility function (B.13) subject to the budget constraint (B.18) implies

$$MU_i \equiv \frac{\partial U / \partial x_i}{\lambda} = q_i + t_i, \qquad i = 1,2, \qquad MDU_L \equiv \frac{\partial U / \partial L}{\lambda} = 1-\tau, \quad \text{(B.19)}$$

where MU_i is the marginal benefit from consumption of good *i*, measured in monetary terms, and MDU_L is the marginal disutility of labour, likewise measured in terms of money. The first part of (B.19) says that the consumer will increase her consumption of good *i* to the point where the utility gain from consuming an extra unit of the good is just equal to its price. The second part of (B.19) says that she will expand her hours of work up to the point where the utility cost of sacrificing an additional hour of leisure is just equal to the net income gain $1-\tau$ from an extra hour of work. Now consider a green tax reform involving a revenue-neutral rise in the indirect tax on the

Box 5.5 cont.

dirty good and a cut in the labour income tax rate. Faced with the new consumer prices and the new after-tax wage rate, the representative consumer will change her labour supply and her consumption of the two goods. With a "d " in front of a variable denoting a change in that variable, we may express the effect of the tax reform on the welfare of the representative consumer (measured in monetary terms) in the following way, where we recall that MEC is the marginal external cost of pollution, defined in (B.17):

$$\frac{dU}{\lambda} = -MEC \cdot dx_2 + MU_1 \cdot dx_1 + MU_2 \cdot dx_2 - MDU_L \cdot dL. \quad \text{(B.20)}$$

The first term on the right-hand side of (B.20) is the utility gain from reduced pollution (assuming that consumption of the dirty good goes down); the second and the third terms reflect the change in utility stemming from the changes in the consumption of the two goods, and the fourth term is the loss of utility arising from an increase in work effort (if any). Without loss of generality, we may choose our units of measurement such that it takes exactly one hour of work to produce one unit of each of the two goods. With a pre-tax wage rate equal to one, and assuming that labour is the only factor of production, the marginal cost of production will then also be one, so in competitive markets the producer prices of the two goods will likewise be one. In other words, we have

$$L = x_1 + x_2 \quad \Rightarrow \quad dL = dx_1 + dx_2 \quad \text{and} \quad q_1 = q_2 = 1. \quad \text{(B.21)}$$

Inserting the results in (B.19) and (B.21) into (B.20), we get

$$\frac{dU}{\lambda} = \overbrace{-MEC \cdot dx_2}^{\substack{\text{First dividend} \\ \text{(environmental gain)}}} + \overbrace{\left(MU_1 - MDU_L\right) \cdot dx_1 + \left(MU_2 - MDU_L\right) \cdot dx_2}^{\substack{\text{Second dividend} \\ \text{(non-environmental efficiency gain)}}} \quad \Leftrightarrow \quad \text{(B.22)}$$

$$\frac{dU}{\lambda} = \overbrace{-MEC \cdot dx_2}^{\text{First dividend}} + \overbrace{\underbrace{\left(\tau + t_1\right)}_{\text{tax wedge}} \cdot dx_1 + \underbrace{\left(\tau + t_2\right)}_{\text{tax wedge}} \cdot dx_2}^{\text{Second dividend}}.$$

The first term on the right-hand side of the expressions in (B.22) captures the welfare gain from the improvement of environmental quality arising when the consumption of the

Box 5.5 cont.
dirty good goes down as a result of a higher excise tax rate. This may be termed the "first dividend" from the green tax reform. As indicated in (B.22), the reform may also generate a "second dividend" arising from the change in the pattern of consumption. When the marginal utility of a good exceeds the marginal disutility from the labour needed to produce it, there is a non-environmental welfare gain from expanding the production and consumption of the good. The difference between the marginal utility of a good and the marginal disutility from its production is given by the total direct and indirect tax burden ($\tau + t_i$) on that good, as shown in the second line in (B.22). Since this tax wedge is positive, there is indeed a welfare gain from increased production and consumption of each good. However, since the green tax reform raises the relative price of the dirty good, it will induce a fall in the consumption of that good and a rise in the consumption of the clean good ($dx_1 > 0$ and $dx_2 < 0$). Hence we cannot say a priori if the second dividend will be positive or negative.

To investigate this issue further, let us start by using the fact that $dL = dx_1 + dx_2$ to rewrite the second line in (B.22) as

$$\frac{dU}{\lambda} = \overbrace{-MEC \cdot dx_2}^{\text{First dividend (environmental gain)}} + \overbrace{t_1 \cdot dx_1 + t_2 \cdot dx_2 + \tau \cdot dL}^{\text{Second dividend (dynamic effect on public revenue)}}. \qquad \text{(B.23)}$$

We see that the second dividend is equal to the impact on total tax revenue of the changes in consumption and labour supply caused by the reform. This is just another illustration of the general point made in Chapter 4 and earlier in the present chapter that, in the absence of externalities, the effect of a tax reform on economic efficiency can be measured by its dynamic revenue effect. With n identical individuals in the economy, total government revenue is

$$R = n \cdot \left(t_1 x_1 + t_2 x_2 + \tau L \right). \qquad \text{(B.24)}$$

Box 5.5 cont.

The green tax reform involves a rise in t_2 and a cut in τ calibrated to ensure that the reform is revenue neutral. According to (B.24) this implies that

$$dR = 0 \;\Rightarrow\; \overbrace{\underbrace{dt_2 \cdot x_2 + d\tau \cdot L}_{(=\text{ effect on private welfare})}}^{\text{Static revenue effect}} + \overbrace{\underbrace{t_1 \cdot dx_1 + t_2 \cdot dx_2 + \tau \cdot dL}_{\text{(no effect on private welfare)}}}^{\text{Dynamic revenue effect (second dividend)}} = 0. \quad \text{(B.25)}$$

The sum of the first two terms in (B.25) is the so-called static revenue effect, i.e., the change in revenue that would occur if taxpayers did not change their behaviour. For the reform to be revenue neutral, the static and the dynamic revenue effects must add up to zero. Note that apart from the environmental effects of a change in the consumption of the dirty good, the behavioural responses underlying the dynamic revenue effect do not have any noticeable impact on private sector welfare. The reason is that since consumers have optimised their consumption and labour supply prior to the reform, they are by definition indifferent towards working a little more or a little less and towards consuming a little more or a little less of the two goods. Hence the non-environmental effect of the tax reform on private sector welfare can be measured solely by the static revenue effect which determines whether the reform implies an immediate gain or an immediate loss in real disposable incomes (before taxpayers start to respond to the change in tax rates). If the dynamic revenue effect is positive, the government can afford to allow the static revenue effect to be negative, that is, it can afford to allow real disposable incomes to increase on impact. Obviously such an income gain implies a welfare gain for consumers. This explains why the second dividend is positive if the dynamic revenue effect of the green tax reform is positive.

Now assume that the representative consumer's utility function takes the form stated in equation (B.13) in Box 5.4, and suppose for simplicity that $\varepsilon_1 = \varepsilon_2 = \varepsilon$ (this is not crucial for our qualitative conclusions). Recalling that $p_i = 1 + t_i$, the consumer optimality conditions in (B.19) can then be shown to imply that

$$x_i = \left(\frac{1+t_i}{1-\tau}\right)^{-\varepsilon}, \qquad i = 1,2 \qquad\qquad L = (1-\tau)^{\varepsilon-1}\left[(1+t_1)^{1-\varepsilon} + (1+t_2)^{1-\varepsilon}\right]. \quad \text{(B.26)}$$

Box 5.5 cont.
We see that both goods now have the same price elasticity of demand (ε). According to Ramsey's inverse elasticity rule the two goods should therefore be taxed at the same rate in the absence of externalities. As a natural benchmark, let us therefore assume that $t_1 = t_2 = t$ in the situation prevailing before the green tax reform. From the labour supply function in (B.26) it follows that the impact of the tax reform on employment is

$$dL = \frac{\partial L}{\partial t_2} \cdot dt_2 + \frac{\partial L}{\partial \tau} \cdot d\tau = \left(\frac{1-\varepsilon}{1-\tau} \right) \cdot \overbrace{\left(x_2 \cdot dt_2 + L \cdot d\tau \right)}^{\text{Static revenue effect}}. \qquad \text{(B.27)}$$

From (B.25) and the facts that $dL = dx_1 + dx_2$ and that $t_1 = t_2 = t$ initially, we have

$$\overbrace{\left(x_2 \cdot dt_2 + L \cdot d\tau \right)}^{\text{Static revenue effect}} = -\overbrace{\left(t_1 \cdot dx_1 + t_2 \cdot dx_2 + \tau \cdot dL \right)}^{\text{Dynamic revenue effect (second dividend)}} = -\left(t + \tau \right) \cdot dL. \qquad \text{(B.28)}$$

Since $\tau + t > 0$, equation (B.28) shows that the dynamic revenue effect (and hence the second dividend) is positive if $dL > 0$, that is, if employment goes up. But taken together, (B.27) and (B.28) imply that

$$dL \cdot \left[1 + \left(1 - \varepsilon \right) \left(\frac{t + \tau}{1 - \tau} \right) \right] = 0. \qquad \text{(B.29)}$$

In general condition (B.29) can only be met if $dL = 0$. In other words, when the initial tax rates have been set efficiently from a non-environmental viewpoint (i.e., in accordance with the Ramsey rule), there can be no employment gain and hence no second dividend from a green tax reform. Further, if the tax rate on the dirty good is already higher than the tax on the clean good before the reform, one can show that a revenue-neutral green tax reform will actually *reduce* employment and will therefore involve a *negative* second dividend. The intuition behind these results and the modifications to them are explained in the main text.

The analysis in Box 5.5 shows that when the initial indirect tax rates have been set in a rational manner from a non-environmental viewpoint, there is no gain in employment and non-environmental welfare from a revenue-neutral green tax reform that introduces pollution taxes and uses the revenue to cut the labour income tax. In other words, a green tax reform can only be expected to yield a "first dividend" in the form of a cleaner environment (a dividend which may of course be important).

The reason for the absence of a second dividend is that a green tax reform just involves a shift from direct to indirect taxation of labour. Just like a labour income tax, the green taxes erode disposable real wages, so in the simple economic model in Box 5.5 a revenue-neutral shift towards green taxes does not stimulate labour supply and employment because it does not improve the incentive to work. Intuitively, when the initial tax rates are set optimally in accordance with the principles of optimal taxation, except that environmental externalities have not been internalized, a change in the tax rate structure cannot generate an additional non-environmental welfare gain on top of the gain from a better environment.

As this reasoning suggests, if for some reason the polluting goods were initially *undertaxed* even when one abstracts from their environmental effects – for example, if "dirty" goods carry a lower initial tax rate than "clean" goods even though the price elasticity of demand for the two types of goods is the same – then a green tax reform would yield a second dividend by bringing the tax on dirty goods closer in line with the Ramsey rule for optimal indirect taxation. On the other hand, if the initial tax rate on dirty goods is already higher than the tax rate on clean goods, a green tax reform will create a *negative* second dividend (a non-environmental welfare loss) by pushing the tax rate structure further away from the structure that would be optimal in the absence of externalities.

The model in Box 5.5 is simplified since it does not include transfer recipients outside the labour market, e.g. pensioners. If these individuals are *not* compensated for the rise in green taxes, say, through a cost-of-living indexation of public retirement pensions, a green tax reform will involve some shift of the tax burden away from workers towards transfer recipients. A revenue-neutral green tax reform will then imply some increase in disposable real wages, thereby stimulating employment and ensuring a positive second dividend. In Box 5.1 we also saw that an

indirect tax on consumption is partly paid by people who finance their consumption out of "pure" profits and out of previously accumulated wealth. The existence of these groups likewise means that a green tax reform without compensatory schemes tends to shift some of the tax burden away from labour, thus generating a positive second dividend through higher employment.

As these examples make clear, a green tax reform can in fact yield a double dividend if policy makers allow the reform to change the distribution of income in favour of workers.[35] However, a similar employment-friendly shift in the distribution of income can be achieved through a shift from direct to indirect taxation without particular reliance on green taxes. Indeed, we already saw in Chapter 4 that indirect taxes are less distortionary and less harmful to employment than direct taxes on labour because indirect taxes also fall on individuals outside the labour market. But if the distributional effects of a further shift from direct to indirect taxes were politically unacceptable before the green tax reform, it seems unlikely that a green tax reform can mobilize sufficient political support unless the shift in the tax burden away from workers is more or less offset through compensation schemes. In such a scenario, the scope for a positive second dividend disappears.

The upshot of this analysis is that green tax reforms should be carried out for the sake of the environment and not in the expectation of some significant additional "second dividend". Certainly there is a strong case for using the revenue from green taxes to cut existing distortionary taxes, but generally such a use of the revenue will just serve to offset the distortionary non-environmental effect that the green taxes will have, apart from their beneficial impact on the environment.

[35] This insight is valid even if we go beyond the simplified economic model set up in Box 5.5. In that box we asked whether a green tax reform can be expected to increase the *supply* of labour, answering this question in the negative. But arguably the popular notion is that a green tax reform may stimulate the *demand* for labour, thereby reducing structural *unemployment* in an imperfect labour market characterized by a permanent excess supply of labour. If the revenue from green taxes is used to finance a cut in, say, the employers' social security taxes, the cost of labour will indeed fall, thus paving the way for increased employment, as long as net public transfers to the unemployed remain unchanged. However, if the tax cuts apply in equal proportions to labour income and transfer income so that the net replacement rate for the non-employed stays the same, economic theory and evidence suggests that the structural unemployment rate would be unaffected (see, e.g., Sørensen (1997)). In other words, even in imperfect labour markets with involuntary unemployment, the long-run unemployment rate will only fall in so far as a green tax reform raises the net income of employed workers relative to the net income of non-employed individuals.

5.4 Conclusions on indirect taxation

This chapter considered the design of indirect taxes, including taxes on polluting activities. Because they are impersonal, indirect taxes are generally inferior instruments for the redistribution of income compared to the progressive personal income tax and targeted income transfers. Yet indirect taxes may serve a useful role as a supplementary source of revenue that helps to avoid an "overburdening" of the income tax. Indirect taxes are also an important means of internalizing externalities, including external environmental effects, and they may help to address problems of myopia and self-control relating to certain forms of addictive unhealthy consumption.

Optimal tax theory also suggests that a differentiated structure of indirect tax rates can help to alleviate the negative impact of the income tax on labour supply. However, we argued that the information needed to implement the theoretically optimal differentiated indirect tax rate structure is not and probably never will be available. For this and a number of other reasons, including administrative simplicity, we argued that a general indirect tax such as the VAT should be uniform across all goods and services. Our quantitative analysis suggested that a move from the current differentiated Swedish VAT to a uniform VAT could generate a gain in economic efficiency somewhere between ½ and 1 percent of total private consumption. At the same time we acknowledged the case for a reduced fiscal burden on certain household-related market services which are very close substitutes for home-produced services or for services delivered from the underground economy. A reduced effective tax rate in this area may be implemented through a tax credit for the purchase of household-related services, as currently practised in Sweden, or through a direct subsidy to maximise transparency.

In the field of excise taxation we did not find a case for significant changes in the level of the traditional "sin" taxes on tobacco and alcohol in Sweden. In particular, though recent research on optimal sin taxes in the presence of self-control problems could justify very high excises on tobacco and alcohol, the possibilities for Swedish consumers to engage in cross-border shopping leaves little scope for higher taxes on these products.

The other Swedish excises consist mainly of environmentally-related taxes. To implement the Swedish targets for reduction of

greenhouse gas emissions in a cost-effective manner, we argued that the carbon tax on firms not covered by the EU Emissions Trading Scheme should in principle be uniform across industries if Sweden is committed to attaining her target for emission reductions regardless of the policies pursued by other countries. However, a reduced tax rate for firms exposed to foreign competition may be warranted as a temporary policy if foreign governments can soon be expected to implement more ambitious climate policies, since there would then be a long-term basis for maintaining carbon-intensive production on Swedish soil. For firms covered by the EU Emissions Trading Scheme we saw little reason to maintain a Swedish carbon tax, since a price of carbon is already established in the European market for carbon allowances. Ideally, the carbon tax rate on the non-ETS sector should equal the average price of carbon emission permits to ensure a minimisation of the total cost of reducing Swedish CO2-emissions. If the resulting carbon tax rate is not sufficient to attain the target for Sweden's emission reductions, the Swedish government could make up for the balance by purchasing carbon emission permits and handing them in to the European Commission. If EU rules do not allow such a cost-effective way of curbing global greenhouse gas emissions, the cost of attaining the target for emissions reduction will be higher than necessary.

Our discussion of energy taxes suggested that energy taxes collected purely for revenue purposes should be levied only on households and should be concentrated on those energy products that are most inelastic in demand in order to minimise the deadweight loss. Energy taxes aimed at internalizing externalities should be levied on firms as well as households and should reflect the marginal social costs created by the externalities. A separate target for energy savings lacks an economic rationale, but if it is maintained, it calls for an additional "energy savings tax" levied on all firms and households in proportion to all of their energy use in whatever form. A separate target for the share of renewable energy surces in total energy use likewise lacks a clear rationale when externalities can be fully corrected through Pigovian taxes on carbon and energy. If such a target is nevertheless maintained, there is a case for reduced (possibly zero) energy tax rates on renewable energy sources.

In the area of road transport we suggested that (part of) the existing energy taxes on gasoline and diesel and (some of) the

recurrent taxes on motor vehicles could be gradually replaced by road-pricing systems in relevant locations as the necessary technology matures and the costs of operating such systems fall. This would be a natural follow-up on the positive experience with the Stockholm congestion tax.

The final part of the chapter discussed the popular double dividend hypothesis that a shift from other taxes towards green taxes will not only improve environmental quality but will also create a "second dividend" in the form of reduced tax distortions in the labour market. If true, this could motivate higher green taxes than would be warranted on purely environmental grounds. However, we saw that in general there will be no second dividend in the form of increased employment and non-environmental welfare, since a green tax reform just involves a shift from direct to indirect taxes on labour. A green tax reform will stimulate employment only if it succeeds in shifting the tax burden away from workers towards other groups, but such a shift can also be achieved through a general switch from direct to indirect taxation that does not involve higher green taxes. Green tax reforms should therefore be undertaken because they improve the environment and not in the expectation that they will yield significant non-environmental gains.

6 The taxation of labour income

Whereas the Swedish and international tax policy debate of the 1980s and early 1990s tended to focus on issues of capital income taxation, the taxation of labour income has drawn increasing attention in recent years. There are several reasons for this.

First, many OECD countries have struggled with high rates of unemployment, and a change in the level and structure of labour income taxation has been seen as one way (among others) of fighting joblessness.

Second, even in countries like Sweden and the other Nordic countries where recorded unemployment has been relatively low by international standards, a large share of the working-age population does not participate in the labour market, creating potential problems of social marginalization. This has stimulated a debate on labour tax reforms which could help to create better work incentives and job opportunities for marginal groups in the labour market.

Third, the demographic trend towards a growing number of elderly people relative to the number of people of working age means that existing welfare state programs will be increasingly difficult to finance unless policy makers find ways of boosting labour supply, e.g. through labour tax reforms.

Fourth, as the most developed OECD countries are increasingly specializing in knowledge-intensive forms of production, human capital has become increasingly important relative to physical capital as a factor of production. Since the incentives to engage in education and skill-upgrading are affected by the structure of the labour income tax, the growing importance of human capital has also stimulated the interest in labour tax reform.

This chapter discusses the design of labour income taxation in Sweden. Direct taxes on labour income are by far the most important source of finance for the Swedish public sector,

accounting for more than half of total tax revenue and about one fourth of GDP, as shown in Table 6.1. This raises an obvious dilemma for policy makers, for while the desire to raise the long-run level of employment speaks in favour of reducing the tax burden on labour, significant cuts in labour income taxes may be very costly for the government because of the great importance of this source of revenue. Given the need to protect public revenue in the face of unfavourable demographic trends, the present chapter will focus on changes in labour income taxation that could be expected to boost labour supply in a way that would generate at least as much revenue as the current tax system.

Table 6.1 Taxes on labour income in Sweden, 2008[1]

	Revenue (billion SEK)	*Percent of total tax revenue*	*Percent of GDP*
Personal income tax to municipalities	497	33.0	0.3
Personal income tax to central government	48	3.2	0.1
General pension contribution (allmän pensionsavgift)	85	5.7	0.1
Income tax rebates[2]	-139	9.3	0.1
Social security contributions paid by employers	404	27.2	1.2
Social security contributions paid by the self-employed	12	0.8	0.8
Special wage tax (särskild löneskatt)	33	2.2	0.2
Reductions in social security contributions	-13	0.9	0.5
Rebates of contributions to pension system	-25	1.7	0.2
Other social security taxes	1	0.1	3.6
Total taxes on transfer income	121	8.1	3.8
Total taxes on labour income[3]	782	52.6	24.8

1. Rounded numbers.
2. Including Earned Income Tax Credit and rebates of general pension contribution.
3. Calculated as the sum of all tax revenues in the preceding rows minus total taxes on transfer income.
Source: Ministry of Finance, Stockholm.

We start by providing a brief overview of existing taxes on labour income in Section 1. In Section 2 we discuss how the modern theory of optimal labour income taxation may help us to evaluate the current Swedish structure of labour income taxation. Section 3

develops a simple method of estimating the degree of self-financing associated with cuts in the labour income tax at different income levels and considers some tax policy experiments that might be more than self-financing in the Swedish context. In Section 4 we sum up our analysis and offer some proposals for reform of labour income taxation in Sweden.

6.1 The taxation of labour income in Sweden: current situation

The personal tax on labour income

Under the Swedish dual personal income tax a progressive tax schedule is applied to the sum of the taxpayer's labour income and taxable transfers. To arrive at taxable income ("beskattningsbar förvärvsinkomst" in Swedish), the sum of labour income and taxable transfers is reduced by a standard deduction plus a deduction for certain costs of acquiring income. The municipalities levy a proportional local income tax on all taxable income. In 2010, the average local income tax rate is 31.5 percent. On top of this, the central government levies a 20 percent tax on incomes above 384,200 SEK measured before the standard deduction and a further 5 percent surtax (the "värnskatt") on taxable income above 544,600 SEK, likewise measured before the standard deduction.

For incomes above the exemption level this system would seem to amount to a fairly simple three-bracket tax schedule. However, the effective marginal tax rate schedule is complicated by the presence of an Earned Income Tax Credit ("jobskatteavdrag") that varies with the level of income and by the fact that the standard deduction likewise varies with income. The income-dependency of the standard deduction matters only for recipients of transfer incomes, since the Earned Income Tax Credit (EITC) is designed to neutralize the impact of the income-dependency of the standard deduction on the effective marginal tax rate on labour income. Specifically, the EITC is calculated as

$$\begin{aligned} EITC &= \tau^k \cdot (S - G) \qquad \text{for} \quad S \geq G, \\ EITC &= 0 \qquad \text{for} \quad S < G. \end{aligned} \tag{1}$$

where τ^k is the municipal income tax rate, G is the standard deduction ("grundavdrag") from the taxable income subject to municipal income tax, and S is an auxiliary income concept ("särskillt belopp") that varies positively but non-linearly with the taxpayer's labour income up to a certain cap. Since $\tau^k G$ is the amount of local income tax relief implied by the standard deduction, and since it is deducted from the EITC according to the first line in (1), it follows that the net tax relief resulting from the combination of the standard deduction and the EITC is equal to $\tau^k S$ which depends only on the way in which S varies with the amount of labour income.

The complex rules for the calculation of the standard deduction and the EITC are described in detail in the appendix to this chapter. The interaction of these rules with the statutory tax rate schedule generates the schedule of effective personal marginal tax rates presented in Table 6.2. The first column in the table measures gross labour income (the employer's gross labour cost) before deduction of any taxes, while the second column measures income after deduction of social security contributions but before the standard deduction. The effective marginal personal tax rate indicates the additional personal income tax paid when the employer's gross labour cost (W) increases by one krona. The gross labour cost is related to taxpayer's personal labour income (w) by the equation

$$W = (1+s)w, \tag{2}$$

where s is the tax-exclusive social security tax rate.[36] In Table A.6.3 in the appendix we have derived the effective marginal personal tax rates as a fraction of wages *after* deduction for social security tax. To convert these marginal personal tax rates into percentages of *gross* labour income, it follows from (2) that one has to divide the marginal tax rates by the factor $(1+s)$ and multiply by 100. The resulting numbers are stated in the third column of Table 6.2.

The first income bracket with a zero marginal tax rate reflects the tax exemption implied by the standard deduction, since the EITC does not kick in until the taxpayer's income exceeds the

[36] As we shall explain below, the social security tax only adds to the effective marginal tax rate for taxpayers with a gross income exceeding roughly 542,000 kronor. This explains why the effective marginal tax rate in the second-last column in Table 6.2 makes a jump at this income level.

standard deduction. We see from Table 6.2 that the combination of the statutory tax rate schedule and the EITC creates an effective personal tax schedule with six different brackets. As we shall now see, the effective tax rate schedule is further complicated by the social security contributions.

Table 6.2 Effective marginal tax rates in the Swedish tax schedule for wage income, 2010

Income[1]		Effective	Effective	Effective marginal
Gross income[2]	Assesed income (taxerad inkost)[3]	personal marginal tax rate (%)[4]	marginal tax rate including social security tax (%)[5]	tax rate including social security tax and consumption tax (%)[6]
0-50,700	0 – 38,600	0	0	24.9
50,700 – 151,700	38,600 – 115,400	16.7	16.7	37.4
151,700 – 390,100	115,400 – 296,800	21.7	21.7	41.2
390,100 – 505,400	296,800 – 384,600	24.0	24.0	42.9
505,400 – 542,000	384,600 – 412,400	39.2	39.2	54.3
542,000 – 716,500	412,400 – 545,200	39.2	63.1	72.3
716,500 -	545,200 -	43.0	66.9	75.1

1. Figures are rounded to the nearest 100 kronor.

2. Income before deduction for social security contribution.

3. Income after deduction for social security contribution but before the standard deduction. The relationship between assessed income (w) and gross income (W) is $W = (1+s)\,w$, where s is the tax-exclusive social security contribution rate which is 31.42 percent in 2010. The corresponding tax-inclusive social security contribution rate is $31.42/(1+0.3142) = 23.9$ percent.

4. Based on the average local government income tax rate of 31.5 percent of assessed income. The tax rates are expressed in percent of gross income.

5. Tax rates measured in percent of gross income. The marginal effective social security tax rate is assumed to be zero for gross income levels below 542,000 kronor and 23.9 percent (tax-inclusive rate) for incomes above that level.

6. Calculated from the numbers in the previous column, using formula (3) in the text and an estimated tax-exclusive consumption tax rate equal to 33.1 percent.

Source: Own calculations based on Beräkningskonventioner 2010. En rapport från Skatteekonomiska enheten på Finansdepartementet.

Social security taxes

The total social security tax is levied at a proportional (tax-exclusive) rate of 31.42 percent on all wages paid out by Swedish employers (arbetsgivaravgift), while sole proprietors are liable to a

proportional social security tax (egenavgift) of 29.71 percent on their assessed personal labour income (28.97 percent from July 2010).

The total social security tax consists of a general wage tax (allmän löneavgift) of 6.03 percent plus a number of specific contributions set so as to cover the expected costs of the different social security benefits. Table 6.3 shows the contribution rates levied to finance the various social insurance programs in 2010 (for the self-employed, the tax rates refer to the second half of 2010).

The social security benefits to which the taxpayer is entitled increase with his level of income up to a cap which varies across the different social insurance programmes. For example, the entitlement to retirement benefit increases in proportion to income up to 8.07 IBB (inkomstbasbelopp), corresponding to about 412,400 kronor (after deduction for social security contribution) in 2010. When income exceeds this threshold, the retirement benefit is capped. For several other benefit programs such as sickness insurance and work injury insurance the income threshold where benefits are capped is 7.5 PBB (prisbasbelopp), equivalent to about 318,000 kronor in 2010.

Table 6.3 Social security contribution rates (percent of personal labour income, 2010)

Social insurance programme	Contribution rate for wage earners (arbetsgivaravgift)	Contribution rate for self-employed (egenavgift)
Retirement benefit programme	10.21	10.21
Sickness insurance	5.95	6.04
Work injury insurance	0.68	0.68
Labour market contribution (unemployment insurance etc.)	4.65	2.11
Life insurance (efterlevandepensionsavgift)	1.70	1.70
Parental leave programme	2.20	2.20
Ordinary wage tax (allmän löneavgift)	6.03	6.03
Total social security contribution	**31.42**	**28.97**

Source: Beräkningskonventioner 2010. En rapport från Skatteekonomiska enheten på Finansdepartementet (Tabell 1, p. 118).

For income exceeding the thresholds where social security benefits are capped, the social security tax clearly works like an ordinary tax, but for income below these levels it may be seen as an

insurance premium. Evaluating the exact element of tax in the total social security contribution is difficult, given the complex nature of the system of social insurance. A pragmatic estimate of the tax element could be obtained through the following line of reasoning:

The most important social security benefit is the retirement benefit which is capped at an assessed income of about 412,400 kronor. The contribution rate for the retirement benefit roughly covers the total expenditure on such benefits, and about 1/3 of the aggregate wage bill consists of wages exceeding 412,400 kronor per annum. Therefore, while 100 percent of the benefit entitlements accrue to wage incomes below 412,400 kronor, the social security tax on these incomes only finances about 2/3 of the benefits. On this basis one could argue that the effective social security tax rate is actually negative for incomes below 412,400 kronor. However, the total social security contribution includes the 6.03 percent general wage tax which does not generate any entitlements. As a very rough approximation, we will therefore assume that the effective marginal social security tax rate (adjusted for the increased benefit entitlement generated by an increase in income) is zero for income below 412,400 kronor, whereas it is equal to the statutory social security tax rate for income above that level.

The total direct tax on labour income consists of the social security tax and the personal labour income tax. The estimates in the fourth column of Table 6.2 express the total marginal direct tax rate in percent of the taxpayer's gross labour income. From (2) and the bottom row in Table 6.3 it follows that, for wage earners with incomes above the level where social security benefits are capped, the effective marginal social security tax rate as a fraction of the gross wage is $s/(1+s) = 0.3142/1.3142 = 0.239 = 23.9\%$. The numbers in the two last rows of the fourth column of Table 6.1 were found by adding this figure to the figures in the two last rows of the third column. Given our assumption that the effective marginal social security tax rate for taxpayers with incomes below 412,400 SEK is roughly zero, we see that the social security tax system adds markedly to the progressivity of direct taxation in Sweden.

The total direct and indirect tax burden on labour

As noted in Chapter 4, the indirect taxes on consumption are also a tax on labour, since they erode the purchasing power of nominal

wages. A measure of the total marginal effective tax rate on labour income (m) should therefore include indirect as well as direct taxes. Let t denote the effective tax rate on consumption measured as a fraction of the producer price, and let m^d indicate the marginal effective direct tax rate on labour income, including social security tax. If we set the level of producer prices equal to one, the level of consumer prices will be $1+t$. When the employer incurs an additional labour cost of 1 krona, the wage earner will receive an additional net wage income of $1-m^d$, but that money will only enable him to increase his real after-tax consumption by $(1-m^d)/(1+t)$ kronor, since indirect taxes drive up consumer prices by the factor t. The total marginal direct and indirect tax wedge between the employer's labour cost and the worker's real net income is thus given by

$$m = 1 - \left(\frac{1-m^d}{1+t} \right) = \frac{m^d + t}{1+t}. \qquad (3)$$

In Chapter 4 we estimated the value of t in Sweden to be around 0.331 = 33.1 percent. Using this value of t in formula (3) along with the figures for m^d stated in the fourth column, the last column in Table 6.2 presents estimates of the total marginal effective tax rate on labour income. We see that when the indirect taxes on labour income are accounted for, low-income earners pay a marginal tax rate slightly less than 25 percent, while top income earners face a tax burden of about 75 percent on every additional krona earned.

It should be stressed that the three last columns in Table 6.2 underestimate the effective marginal tax rates that many low-income earners face when one accounts for the existence of means-tested public transfers. A means-tested benefit that is gradually phased out as the recipient's labour income goes up effectively adds to the net tax imposed on an extra krona earned. To estimate the effective marginal tax rates implied by the tax-transfer system as a whole, one would have to estimate how means-tested benefits are distributed across the different income intervals in the Swedish working population. Such an exercise goes beyond the scope of the present chapter, but it should be kept in mind that since means-tested benefits are concentrated at the lower end of the income distribution, Table 6.2 tends to underestimate the effective marginal tax rates for low-income earners.

6.2 The theory of optimal labour income taxation: some lessons for Sweden

This main section briefly discusses some insights from optimal tax theory which may help to design a rational system of labour income taxation. As a prelude, we start by describing the different margins of labour supply that may be distorted by taxation. We then consider some basic lessons from the theory of optimal labour income taxation, and against this background we discuss some recent changes in the taxation of labour income in Sweden.

The different margins of labour supply

Many discussions of the effect of tax policy on labour supply centre on the impact of taxation on the so-called intensive margin of labour supply where workers who are already employed decide whether to work a little more or a little less, assuming that they have some flexibility when deciding how many hours of work to supply. This focus on the intensive margin has prompted many observers to conclude that the impact of taxation of labour supply must be (very) small, since many workers are constrained by collective bargaining agreements or local work-place arrangements in their choice of work hours. In line with this, most microeconometric studies of labour supply do in fact indicate that the elasticity of hours worked is quite small for the core groups in the labour market, especially male workers.

However, in recent years this view of the effects of taxation on labour supply has been challenged for being too narrow for at least two reasons. The first one is that a cut in the average tax rate on labour income increases the gap between the net income from employment and the net income of people who are not employed. A lower average labour income tax can therefore boost employment at the so-called extensive margin where people decide whether to join the labour force and, if they have already joined, how hard they are looking for a job if they are currently unemployed. Theoretical and empirical research has shown that even in imperfect labour markets with involuntary unemployment, increased labour force participation and job search intensity will translate into a higher equilibrium level of employment by

moderating real wage claims (see, e.g., Kolm and Tonin (2010)). Indeed, many recent empirical studies have found that for "marginal" groups in the labour markets such as the young, the elderly, single mothers, and some ethnic minority groups, the elasticity of labour supply at the extensive margin can be quite high.

Second, it is increasingly recognized that variations in the "effective" labour supply of those already employed can take many forms other than changes in the number of hours worked. As we explained in Chapter 4, any change in behaviour which expands the tax base will tend to improve economic efficiency. Examples in the area of labour income taxation include productivity-increasing responses to lower tax rates such as increased effort on the job, skill upgrading through education and on-the-job-training, and higher mobility from low-paying to high-paying jobs. Lower tax rates can also broaden the tax base through changes in the form of remuneration from (untaxed) fringe benefits to cash wages, shifts from untaxed do-it-yourself activities and underground activities to (taxed) market activities, etc. In Chapter 4 we noted that all such behavioral responses to a change in the effective marginal tax rate are captured by the elasticity of taxable income, and many recent empirical studies have found that this elasticity tends to be considerably larger than the elasticity of hours worked.

With this in mind we turn to the lessons that may be learned from the theory of optimal labour income taxation.

Determinants of the optimal labour income tax schedule

The locus classicus of the modern theory of optimal income taxation is the article by Mirrlees (1971) who offered a new and rigorous way of analyzing the trade-off between equity and efficiency when policy makers wish to redistribute income through a progressive labour income tax. However, Mirrlees abstracted from the fixed costs of working (e.g. costs of child care, commuting, etc.) which mean that a tax change can induce some people to "jump" from not working at all to being full-time (or at least half-time) employed. In other words, Mirrlees did not make an explicit distinction between labour supply responses at the extensive and the intensive margin.

The importance of this distinction for the optimal labour income tax schedule was highlighted by Saez (2002) who studied the determinants of the optimal marginal tax rate at different income levels when labour supply can vary at both margins. Box 6.1 explains the essence of his analysis which shows that the optimal marginal tax rate at some given income level z_i should be lower 1) the greater the intensive labour supply elasticity at z_i, 2) the larger the number of taxpayers at z_i, 3) the smaller the number of taxpayers with incomes above z_i, 4) the greater the extensive labour supply elasticity for all taxpayers earning z_i or more, 5) the higher the "participation tax rates" for people with a potential income of z_i or more, that is, the more their net payment to the public sector goes up when they move from non-employment to being employed in group *i*, and 6) the higher the social value attached to an extra krona of income for taxpayers with an income of z_i or more.

Box 6.1 Optimal taxation of labour income

In an influential contribution, Saez (2002) has studied the optimal income tax schedule for labour income when labour supply can vary at the extensive margin where people decide whether or not to join the work force as well as at the intensive margin where people already employed vary their work effort. Saez divides taxpayers into *J* different income groups ordered by the average level of labour income in the group. Thus group zero consists of people outside the work force who earn zero labour income, and group *J* is the group of top income earners. Labour supply responses on the intensive margin are modeled by assuming that, by varying their work effort (sufficiently), workers can move one step up or down the income ladder. The strength of the intensive labour supply response to a change in earnings opportunities for income group *i* is measured by the *intensive* labour supply elasticity (ς_i), defined in the following way (where a "*d* " in front of a variable denotes the change in that variable):

$$\varsigma_i = \frac{dh_i / h_i}{d\left(z_i^a - z_{i-1}^a\right) / \left(z_i^a - z_{i-1}^a\right)}. \qquad \text{(B.1)}$$

Box 6.1 cont.
Here z_i^a is the average after-tax labour income in group *i*, and h_i is the fraction of the working-age population belonging to income group *i* . Thus ς_i indicates how much this fraction goes up in response to a rise in the net income gap $z_i^a - z_{i-1}^a$ between people in group *i* and persons in group *i*-1. It can be shown that $\varsigma_i \equiv \varepsilon_i \alpha_i$, where ε_i is the elasticity of taxable income with respect to one minus the marginal tax rate, estimated in numerous recent empirical studies, and α_i is the ratio between the rise in the marginal tax rate and the rise in the average tax rate for individuals in group *i*.

On the extensive margin, the strength of the labour supply response is measured by the *participation elasticity* (η_i), defined as

$$\eta_i = \frac{dh_i / h_i}{d\left(z_i^a - B_0\right) / \left(z_i^a - B_0\right)}, \tag{B.2}$$

where B_0 is the average after-tax income (e.g. public transfers) of people of working age who are not currently employed. The participation elasticity thus reflects the increase in the number of persons in income group *i* when the net income gap between people in that group and non-employed persons goes up.

The policy makers' preferences for redistribution of income are captured by a set of variables $g_i,\ i = 0,1,....,J,$ where g_i is the social valuation of an extra krona of net income to individuals in income group *i*, relative to the social valuation of an extra krona of income distributed evenly across the whole population.

Based on this framework, Saez (2002) demonstrates that the labour income tax schedule representing an optimal trade-off between equity and efficiency will involve the following marginal tax rate (m_i) for income group *i* :

$$\frac{m_i}{1-m_i} = \frac{1}{\varsigma_i h_i} \sum_{j=i}^{J} h_j \left[1 - g_j - \eta_j \left(\frac{a_j + b_j}{1 - \left(a_j + b_j\right)} \right) \right], \qquad a_j = \frac{T_j}{z_j}, \quad b_j = \frac{B_0}{z_j}. \tag{B.3}$$

The variable z_j is the average pre-tax labour income earned by a person in group *j*, and T_j is the total labour income tax bill payable on that income. Hence a_j is the *average tax rate* for income group *j*, and $a_j + b_j$ is the so-called *participation tax rate*

Box 6.1 cont.
for income group *j*, measuring the increase in net taxes imposed when a person moves from non-employment to employment in income group *j*. Note that the participation tax consists partly of the labour income tax payable at the income level *j* and partly of the loss of the income B_0 (e.g. the social benefit) to which one is entitled when not being employed.

Formula (B.3) has a number of implications for tax policy: 1) The optimal marginal tax rate at the income level z_i is lower the higher the intensive labour supply elasticity (ς_i) and the larger the number of taxpayers (h_i) at that income level. This is intuitive, since the efficiency loss from a rise in the marginal tax rate will be greater the more taxpayers who are affected by it and the stronger their labour supply responds to a change in the net gain from additional effort. 2) Since a rise in the marginal tax rate at income level z_i reduces the net labour income of all taxpayers above that earnings level, it induces some of them to exit the labour market. The strength of this extensive labour supply response is larger the higher the participation elasticities $\eta_j, j = i, i+1, ..., J,$ and the resulting loss in net public revenue is greater the higher are the initial participation tax rates $a_j + b_j$ of the affected groups and the greater the number of people in these groups. The labour supply response at the extensive margin therefore reduces the optimal marginal tax rate at income level z_i to a larger extent the higher are the values of η_j, $a_j + b_j$ and h_j above that income level. 3) Because a higher marginal tax rate at income level z_i cuts into the disposable income of all taxpayers above that level, the optimal marginal tax rate is lower the higher is the social valuation of income for taxpayers above the income level considered; i.e. the larger the values of the welfare weights $g_j, j = i, i+1, ..., J$, and the greater the number of people carrying these weights (h_j).

While the factors mentioned in 1) and 2) reflect how concerns about economic efficiency shape the optimal tax schedule, the

Box 6.1 cont.
parameters in 3) reflect equity concerns. However, note from (B.3) that allowing for labour supply responses at the extensive margin (an efficiency concern) is equivalent to attaching a higher social welfare weight to groups with high participation elasticities and/or groups with high participation tax rates.

It is instructive to consider the special case where labour supply only responds at the intensive margin. In this case where $\eta_j = 0$, formula (B.3) implies that the optimal marginal tax rate for the lowest-paid workers is

$$\frac{m_1}{1-m_1} = \frac{1}{\varsigma_1 h_1} \sum_{j=i}^{J} h_j \left(1 - g_j\right). \tag{B.4}$$

By definition the population weights must sum to one, i.e., $\sum_0^J h_j = 1$. Further, consistency in the construction of the distributional weights g_j requires that if an additional krona of income is distributed evenly across the population, its social value is also one krona. This implies that $\sum_0^J h_j g_j = 1$. Using these relationships, we can rewrite (B.4) as

$$\frac{m_1}{1-m_1} = \frac{1}{\varsigma_1 h_1}\left[\overbrace{\sum_{j=0}^{J} h_j}^{=1} - h_0 - \overbrace{\sum_{j=0}^{J} h_j g_j}^{=1} + h_0 g_0\right] = \frac{(g_0 - 1)h_0}{\varsigma_1 h_1}. \tag{B.5}$$

The parameter g_0 is the social value of an additional krona distributed to the poorest segment of the population, assumed to be those outside the labour market. If there are strong political preferences in favour of redistribution towards the poorest group, the value of g_0 will be far above one. In that case we see from (B.5) that the optimal marginal effective tax rate on labour income at the bottom of the pay scale could be quite high. In practice, a high marginal tax rate at the bottom of the wage distribution could be implemented through means-tested transfers to the non-employed which are rapidly phased out in the income intervals above the lowest one.

Consider next the opposite benchmark case where labour supply only responds at the extensive margin ($\varsigma_j = 0$). In that

Box 6.1 cont.
case a rearrangement of (B.3) implies that the optimal marginal effective tax rate on the lowest-paid workers becomes

$$\frac{m_1}{1-m_1} = \frac{1-g_1}{\eta_1}. \qquad \text{(B.6)}$$

With strong political preferences for redistribution towards low-income earners, we would still expect a value of the distribution weight g_1 to be significantly above one. In that case (B.6) implies that the effective marginal labour income tax rate for the lowest-paid workers should be *negative*. One way of implementing this could be via a generous Earned Income Tax Credit (EITC) for low-wage earners.

As these examples suggest, the optimal labour income tax schedule depends very much on the relative magnitude of the elasticities of labour supply at the intensive and the extensive margin.

When considering the optimal marginal tax rates at the high end of the income scale, it is important to keep in mind that the intensive labour supply elasticity ς_i is the product of the elasticity of taxable income for those already employed and the parameter α_i measuring the ratio between the rise in the marginal tax rate and the rise in the average tax rate for group *i*. When the marginal tax rate for that group is increased by the amount *dm*, the resulting increase in the average tax rate (denoted *da* and defined as the rise in the total tax bill for a person in group *i* divided by his pre-tax income) is $da = dm \cdot (z_i - z_{i-1})/z_i$, where z_i is the average pre-tax income in group *i*. Hence we have $\alpha_i \equiv dm/da = z_i/(z_i - z_{i-1}) = 1/(1 - z_{i-1}/z_i)$. If the income scale is divided into intervals $z_i - z_{i-1}$ of equal absolute length, the fraction $1/(1 - z_{i-1}/z_i)$ will increase as we move up the income ladder. Ceteris paribus, this will increase the magnitude of the intensive labour supply elasticity ς_i the higher the level of income considered, so this factor works in favour of relatively low marginal tax rates at the high end of the

Box 6.1 cont.
income distribution. The intuition is that when taxpayers react to a rise in the marginal tax rate by reducing their work efforts, the resulting revenue loss is larger the higher taxpayers' initial income level, so in order to limit the deadweight loss from taxation, the income tax should not discourage the work efforts of high-income earners too much. Of course, egalitarian political preferences (reflected in low values of the distributional weights g_j for the high-income groups) work in the opposite direction by favouring high marginal tax rates for taxpayers at the upper end of the income distribution.

Saez (op.cit.) applies the general formula (B.3) to simulate the optimal tax schedule, using data on the U.S. wage distribution plus alternative assumptions about labour supply elasticities and the government's tastes for redistribution. The latter are specified as

$$g_j = g\left(c_j\right) = \frac{1}{p \cdot c_j^{\nu}}, \qquad 0 \le \nu \le +\infty, \tag{B.7}$$

where the parameter ν measures the strength of the preference for redistribution, and p is the marginal social value of public funds, calibrated to ensure that the social value of a krona distributed evenly across all taxpayers is in fact one krona. For plausible values of the intensive labour supply elasticities, Saez finds that it takes fairly high participation elasticities to justify negative marginal tax rates at the bottom of the income scale, especially if the preference for redistribution is strong. However, with realistic participation elasticities, the lowest-paid workers should face rather low marginal tax rates in order not to discourage their participation, and this can provide a role for some form of an EITC. The new focus in optimal tax theory on the importance of the extensive margin of labour supply thus offers a rationale for the recent trend in many OECD countries towards the introduction of various in-work benefits (such as an EITC) that are intended to "make work pay".

In other words, the optimal marginal labour income tax rate at any given income level is determined by several factors including the labour supply elasticities at the extensive and the intensive margins,

the distribution of taxpayers across different income intervals, and the political preferences for redistribution reflected in the "social weights" attached to an extra krona of income in the different income groups. As some of these factors may pull in opposite directions, the implications for the optimal tax schedule are far from obvious.

In particular, if labour supply reacts only at the intensive margin, the optimal marginal effective tax rates at the bottom of the wage distribution could be quite high, as explained in Box 6.1. The reason is that an egalitarian society will want to undertake a significant redistribution towards the poorest group in society which will typically be people who are not employed. When the labour supply elasticity is zero at the extensive margin, this redistribution can be achieved through relatively generous transfer payments to the non-employed without discouraging labour force participation. However, to avoid an excessive budgetary cost, these transfers will have to be phased out in the income intervals above the lowest one. As a consequence of this targeting of benefits towards the poorest, the effective marginal tax rate on low-income wage earners will be high. Although this will reduce the labour supply of these individuals on the intensive margin, the resulting efficiency loss is limited by their low earnings capacity and is therefore seen as an acceptable price to be paid for the equity gain of redistribution towards the poorest group. The point is that the much criticized "poverty traps" created by a rapid phase-out of benefits can actually be an optimal policy when labour supply only responds at the intensive margin.

However, Box 6.1 also explains that when labour supply is flexible only at the extensive margin, an egalitarian society will want to *subsidise* work at the low end of the wage distribution by allowing the effective marginal labour income tax rate to be *negative* for the lowest paid workers. This could be achieved through a generous Earned Income Tax Credit for low-paid workers which is gradually phased out as earnings increase so as to reduce the budgetary cost. The optimality of this policy hinges on the fact that subsidisation of work at the bottom end of the pay scale encourages labour force participation, thereby reducing the fiscal cost of supporting the non-employed, and even if a work subsidy for low-income earners distorts labour supply, this distortion is justified by the desire to redistribute income in favour of persons with a low earnings potential. Moreover, phasing out

the EITC at higher income levels does not reduce the hours worked in these income intervals when labour supply is inelastic at the intensive margin.

At the high end of the income ladder, the political preference for redistribution speaks in favour of high marginal tax rates. However, since the dynamic revenue loss from reduced work effort is greater the higher the earnings potential of the taxpayer, the concern for economic efficiency pulls in the direction of relatively *low* marginal tax rates for high-income earners, as explained in Box 6.1. Intuitively, since high-income earners have the potential to generate a lot of taxable income, you do not want to weaken their work incentives too much.

Some lessons for Sweden

As already mentioned, recent empirical studies indicate that the labour supply elasticity at the extensive margin (the participation elasticity) can be quite high for many groups at the bottom of the wage distribution whereas the participation elasticities at the high end of the income distribution are probably small, perhaps even zero. When coupled with the traditional assumption of a low labour supply elasticity at the intensive margin, this observation suggests that the recent introduction of an Earned Income Tax Credit in Sweden may well be in line with the theory of optimal taxation summarised above.

The Swedish EITC lowers the participation tax rate for all workers, and it also lowers the marginal effective tax rates for individuals with gross labour incomes in the interval from 50,700 to 390,100 SEK. However, unlike the EITCs in countries like the US and the UK, the Swedish EITC is not phased out for high-income earners, but is simply capped for gross incomes above 390,100 SEK. The lack of a phase-out may be justified by the relatively compressed Swedish wage distribution which means that a large number of taxpayers would face an increase in their marginal effective tax rate if the income range for the phase-out were placed somewhere in the middle of the wage distribution. Indeed, calculations by the National Institute for Economic Research (Konjunkturinstitutet) reported by the Swedish Fiscal Policy Council (Finanspolitiska Rådet, 2008, p. 199) indicate that the degree of self-financing associated with the EITC would fall

significantly if the tax credit were gradually phased out for taxpayers with gross labour incomes above 237,000 SEK (2008 level). This conclusion was reached despite the fact that a phase-out of the EITC would have a positive income effect on the labour supply of the individuals who lose their eligibility for the tax credit.

The formal analysis in Box 6.1 does not explicitly account for the existence of permanent ("structural") involuntary unemployment. One argument in favour of an EITC is that it may reduce structural unemployment by encouraging wage moderation. The reason is that an EITC reduces the so-called net replacement rate, defined as the ratio of the after-tax unemployment benefit to the after-tax wage rate. In this way an EITC increases the net gain from employment, providing a stronger incentive for wage setters to secure more jobs through moderate wage claims.

A recurrent theme in the tax policy debate is whether the existing tax-transfer system makes it more efficient to lower the tax burden on low-paid rather than on high-paid labour. For example, if it is decided to cut taxes on labour, would it be better (from the viewpoint of economic efficiency) to increase the EITC for lower-paid workers, or would it be preferable to cut marginal income tax rates at the top, say, by eliminating the surtax (värnskatt) on high-income earners? The Swedish Fiscal Policy Council has argued that the increases in the EITC which took place in 2007 and 2008 have involved a higher degree of self-financing than an abolition of the värnskatt would have done, indicating that the former policy was in fact preferable from an efficiency viewpoint (Finanspolitiska Rådet, 2008, p. 199). The Fiscal Policy Council also notes that an increase in the EITC rather than an abolition of the värnskatt generates a more equal distribution of income.

These observations are remarkable, since they seem to suggest that the government could improve the efficiency as well as the equity of the Swedish tax system by increasing the värnskatt and using the extra funds to finance a further increase in the EITC. In that case the current Swedish tax system would certainly be far from optimal by the standards of optimal tax theory. However, as the analysis in the next section will indicate, it is probably much too optimistic to expect that a reshuffling of taxes that involved an increase in the värnskatt would improve economic efficiency as well as equity. On the contrary, the case for abolishing the värnskatt seems quite strong, as we shall see.

Another issue in the Swedish tax policy debate has concerned the best way of designing tax cuts at the upper end of the income distribution, assuming that policy makers have decided that such cuts are warranged to improve economic efficiency. According to estimates by the National Institute for Economic Research, the degree of self-financing is higher if a tax cut for high-income earners takes the form of an increase in the income threshold for payment of the progressive central government income tax than if it takes the form of an abolition of the värnskatt (Finanspolitiska Rådet, 2008, p. 199). Since the gains in disposable income from a higher threshold for the central government income tax would be more evenly distributed among high-income earners than the gains from an elimination of the värnskatt, it seems once again that there is no conflict between equity and efficiency in the design of tax cuts. Unfortunately the analysis in the next section does not support this optimistic conclusion.

6.3 Could labour income tax cuts pay for themselves?

What determines whether labour tax cuts pay for themselves?

One way of analyzing whether a restructuring of the labour income tax could improve economic efficiency without compromising distributional goals is to estimate the degree of self-financing associated with a cut in the marginal effective tax rate at different income levels. Assuming that policy makers wish to redistribute income from the rich to the poor, an optimal tax system should involve an increasing degree of self-financing as we move up the income ladder, for if the opposite were the case, the government could improve equity as well as efficiency by raising marginal tax rates at the top in order to finance cuts in the marginal (and average) tax rate at the lower end of the income distribution.

Box 6.2 presents a simple as well as a more sophisticated formula for the degree of self-financing (*DSF*) associated with a cut in the marginal tax rate for all incomes above a certain level. If this level happens to be zero, we are back to the scenario in Chapter 4 where we studied the effects of an identical cut in the marginal labour income tax rate for all taxpayers. Unlike the investigation in Chapter 4, the analysis in Box 6.2 only includes the

effects of a change in the tax rate on the labour income tax base itself and on the consumption tax base, whereas effects on the business income tax base and the savings income tax base are ignored. This means that the formulas (B.13) and (B.14) tend to underestimate the *DSF*.

The simple formula (B.13) assumes that the labour income tax base only depends on the effective marginal labour income tax rate plus a number of unspecified non-tax factors which are assumed to be constant. Since the analysis in Box 6.1 showed that labour force participation depends on the participation tax rate (defined in (B.3)) rather than the marginal tax rate, formula (B.13) should be seen as an estimate of the degree of self-financing resulting from labour supply responses on the intensive margin, interpreted broadly to include all behavioural responses tending to increase the taxable income of persons who are already employed. Since high-income earners probably have a participation elasticity close to zero, formula (B.13) may provide a good approximation of the DSF for a cut in the top marginal income tax rate.

Box 6.2. The degree of self-financing of a labour income tax cut

How much of the initial revenue loss is recouped through the behavioural responses of taxpayers when the labour income tax is cut? This issue was studied in Chapter 4, but there we only considered the effect of an identical cut in the marginal labour income tax rate for all taxpayers. Here we investigate the effect of cutting the effective marginal labour income tax rate for all persons with labour incomes above some level $\overline{z}$. If $\overline{z} = 0$, we are thus considering a marginal tax rate cut for all taxpayers, in which case we are back to the scenario in Chapter 4. If one includes indirect as well as direct taxes in our measure of the marginal effective tax rate on labour income – in accordance with formula (3) in the text - our formulas (B.13) and (B.14) below can account for the effect of a tax cut on the consumption tax base as well as the labour income tax base. However, for simplicity we ignore the impact of a change in labour supply on the bases for the taxes on business income and savings income. This means that our formulas (B.13), (B.14)

Box 6.2 cont.
and (B.17) will somewhat underestimate the degree of self-financing.
Let m denote the average value of the marginal effective tax rate on labour income above $\overline{z}$, and let z be the average assessed labour income for taxpayers earning at least $\overline{z}$ kronor. The "marginal retention ratio" 1-m is the fraction of an extra krona earned which the taxpayer gets to keep for himself. The higher the marginal retention ratio, the greater is the incentive to earn additional income. We therefore assume that assessed income increases with 1-m so that

$$z = f\left(1-m\right), \qquad f' \equiv \frac{dz}{d\left(1-m\right)} > 0. \tag{B.8}$$

By assuming that income depends only on the marginal retention ratio 1-m, equation (B.8) abstracts from pure income effects on labour supply, i.e., from the fact that a change in the marginal tax rate affects total disposable income which may in turn affect the demand for leisure. However, in line with the international literature, recent empirical studies in Sweden have generally found very small income effects on labour supply (see Finansdepartementet (2009b, pp. 49-50)). Hence the assumption of a zero income effect underlying (B.8) is probably a good first approximation.

It will be useful to express the sensitivity of assessed income with respect to the marginal retention ratio in the form of the following elasticity, referred to in the international literature as the elasticity of taxable income:

$$\varepsilon = \frac{dz}{d\left(1-m\right)}\frac{1-m}{z}. \tag{B.9}$$

As mentioned earlier in this chapter, the elasticity of taxable income captures the effect on the tax base of all types of taxpayer reactions to a change in the marginal tax rate.

Consider now the effect on total tax revenue induced by a small change in the effective marginal tax rate (dm) on all labour income above the level $\overline{z}$. The change in revenue (dR) may be split into the "static" revenue change (dR^s) that would occur if taxpayer behaviour did not respond to the change in the tax

Box 6.2 cont.
rate, and the "dynamic" effect on revenue (dR^d) resulting from the change in behavior, that is

$$dR = dR^s + dR^d. \tag{B.10}$$

If the total number of taxpayers earning more than $\bar{z}$ is N, the static revenue effect is

$$dR^s = dm \cdot (z - \bar{z}) \cdot N, \tag{B.11}$$

where we recall that z is the average initial level of income above the threshold $\bar{z}$. Using the definition of ε given in (B.9) plus the fact that $d(1-m) = -dm$, the dynamic revenue change generated by behavioural responses to the change in the marginal tax rate can be written as

$$dR^d = m_1 \cdot dz \cdot N = -dm \cdot \left(\frac{dz}{d(1-m)} \right) \cdot m_1 \cdot N = -dm \cdot \left(\frac{m_1}{1-m_0} \right) \cdot \varepsilon \cdot z \cdot N, \tag{B.12}$$

where m_0 and m_1 are the marginal effective tax rates prevailing before and after the tax rate change, respectively.

The degree of self-financing (*DSF*) associated with a tax cut is the fraction of the static revenue loss which is recovered via the dynamic revenue gain from taxpayer efforts to increase their taxable income. From (B.11) and (B.12) we thus have

$$DSF \equiv -\frac{dR^d}{dR^s} = \frac{m_1}{1-m_0} \cdot \varepsilon \cdot \alpha, \qquad \alpha \equiv \frac{z}{z - \bar{z}} \geq 1. \tag{B.13}$$

The parameter α measures how close the average income above the threshold $\bar{z}$ is to that threshold. If incomes above $\bar{z}$ are concentrated close to that level, we see from (B.13) that α will be large, making for a high degree of self-financing. The reason is that the static revenue change $dm \cdot (z - \bar{z}) \cdot N$ will be small when the gap between z and $\bar{z}$ is small, whereas the dynamic revenue change is independent of that gap. Intuitively, when most taxpayers facing a higher marginal tax rate only earn a little more than the income threshold triggering the higher marginal tax, the additional revenue gained if taxpayers do not change

Box 6.2 cont.
their behaviour is small, but the disincentive effect of the higher marginal tax is the same whether the taxpayer starts out from an initial income very close to $\overline{z}$ or from an income far above $\overline{z}$. Hence the revenue effect from the behavioural response (dR^d) will tend to be larger relative to the static revenue effect (dR^s) when z is closer to $\overline{z}$, as shown by (B.13).
A complementary interpretation of α is that it measures the ratio between the change in the marginal tax rate (*dm*) and the change in the average tax rate (*da*) for the typical taxpayer with an income above the threshold $\overline{z}$. To see this, note that for the average taxpayer above that threshold, the total tax bill increases by the amount $dm \cdot (z - \overline{z})$. When this amount is divided by the taxpayer's total pre-tax income *z*, we get the rise in his average tax rate, i.e., $da = dm \cdot (z - \overline{z}) / z$. Hence we have $dm / da = z / (z - \overline{z}) = \alpha$. As we explained in Box 6.1, the value of α will tend to increase as we move upwards in the income distribution.

Returning to formula (B.13), we see that a higher elasticity of taxable income (ε) will also increase the degree of self-financing by increasing the magnitude of the dynamic revenue change, as taxpayers respond more strongly to the change in the marginal tax rate. Finally, we see that, for constant values of the other parameters, the *DSF* will be larger the higher the initial marginal tax rate, since a higher initial value of *m* means that any given change in the marginal tax rate implies a larger relative change in the marginal retention ratio $1 - m$ and hence a stronger increase in the incentive to earn additional income.

The assumptions on taxpayer behaviour underlying formula (B.13) are embodied in equation (B.8). As mentioned, this simple equation does not account for income effects of a change in the marginal tax rate; nor does it allow for labour supply responses on the extensive margin. When income effects and the effects on labour force participation are accounted for, Sørensen (2008a) shows that the degree of self-financing associated with a cut in the marginal effective tax rate for taxpayers above the income threshold $\overline{z}$ is given by the more complex expression

Box 6.2 cont.

$$DSF = \overbrace{\left(\frac{m_1}{1-m_0}\right)\left[\alpha\varepsilon^c + \left(\frac{1-m_0}{m_0+y-a}\right)\varepsilon^Y\right]}^{\text{revenue effect of behavioural response at the intensive margin}} + \overbrace{\left(\frac{a_1+b}{1-(a_0+b)}\right)\eta}^{\text{revenue effect of behavioural response at the extensive margin}}, \quad \text{(B.14)}$$

where ε^c is the *compensated* elasticity of taxable income with respect to the marginal retention ratio (capturing the substitution effect), ε^Y is the (negative) income elasticity of labour supply at the intensive margin, y is the ratio of the taxpayer's income from wealth to his pre-tax labour income, η is the participation elasticity defined in equation (B.2) in Box 6.1, and $a+b$ is the participation tax rate defined in formula (B.3) in that box. We see that the parameter α defined in (B.13) still appears in the more general formula (B.14), but now it is multiplied by the compensated rather than the uncompensated elasticity of taxable income. Since a rise in net income tends to increase the demand for leisure, thereby reducing labour supply, the compensated elasticity is at least as large as the uncompensated elasticity of taxable income. Comparing (B.13) and (B.14), we see that the two formulas are fully consistent, since (B.14) simplifies to (B.13) when there is no labour supply response on the extensive margin ($\eta = 0$) and no income effect on labour supply at the intensive margin (in which case we have $\varepsilon^Y = 0$ and $\varepsilon^c = \varepsilon$).

The analysis above applies to a policy experiment where the marginal tax rate is cut for all incomes above a certain threshold level. We can use the same methodology to derive the *DSF* for an alternative policy experiment that raises the income threshold beyond which a higher marginal tax rate is applied. For example, in the Swedish context one could consider the effects of raising the income level beyond which social security benefits are capped. Referring to Table 6.2, this would imply an increase in the gross income level (currently 542,000 SEK) beyond which the social security contribution starts to work like an ordinary tax. For taxpayers earning more than 542,000 SEK but less than the new (higher) income level where benefits

Box 6.2 cont.
are capped, this would imply a cut in the marginal effective income tax rate corresponding to the social security tax rate.

Let us therefore assume that the income threshold where some progressive surtax starts to "kick in" is raised from some initial level $\overline{z}_0$ to a new and higher level $\overline{z}_1$ so that taxpayers with an income between $\overline{z}_0$ and $\overline{z}_1$ experience a drop in their marginal tax rate equal to $m_0 - m_1$, where m_0 is the marginal tax rate on income above the initial progressivity threshold, and m_1 is the marginal tax rate on income below that initial threshold. It is common to assume that the participation elasticity η is in fact close to zero at the upper end of the income distribution, and as noted previously, the income elasticity ε^Y also seems to be small empirically. As a simplifying approximation, we will therefore maintain the assumption underlying equation (B.8) that the average taxable income *z* of the taxpayers who experience a drop in their marginal tax rate depends only on the marginal retention ratio 1-*m* (plus a number of non-tax factors which are taken to be constant).

The static revenue effect of the policy experiment will be

$$dR^s = \overbrace{(m_1 - m_0)\cdot(z - \overline{z}_0)\cdot(N_0 - N_1)}^{\text{tax relief for taxpayers with incomes between the old and the new progressivity threshold}} + \overbrace{(m_1 - m_0)\cdot(\overline{z}_1 - \overline{z}_0)\cdot N_1}^{\text{tax relief for taxpayers with incomes exceeding the new progressivity threshold}}, \qquad \text{(B.15)}$$

where N_0 is the number of taxpayers with incomes above the old progressivity threshold $\overline{z}_0$, and N_1 is the number of taxpayers with income exceeding the new progressivity threshold $\overline{z}_1$, so that $N_0 - N_1$ is the number of taxpayers who experience a cut in their marginal tax rate from m_0 to the lower level m_1. The first term in (B.15) thus captures the total reduction in tax collections from those individuals, while the second term records the loss of revenue resulting from the fact that each taxpayer with an income above the new progressivity threshold now faces a lower tax burden on income in the interval from $\overline{z}_0$ to $\overline{z}_1$.

Box 6.2 cont.
Since taxpayers with an income between $\overline{z}_0$ and $\overline{z}_1$ get a cut in their marginal tax rate equal to $m_0 - m_1$, and since their marginal tax rate after the rise in the progressivity threshold is m_1, it follows from (B.8) and (B.9) that the dynamic revenue effect of the policy experiment may be written as

$$dR^d = (m_0 - m_1) \cdot \frac{dz}{d(1-m)} \cdot m_1 \cdot (N_0 - N_1) = (m_0 - m_1) \cdot \left(\frac{m_1}{1-m_0} \right) \cdot \varepsilon \cdot z \cdot (N_0 - N_1). \quad (16)$$

From (B.15) and (B.16) we find that the degree of self-financing associated with the rise in the progressivity threshold is

$$DSF = -\frac{dR^d}{dR^s} = \left(\frac{m_1}{1-m_0} \right) \cdot \varepsilon \cdot \alpha_0 \cdot \left[\frac{1}{1 + \left(\frac{\overline{z}_1 - \overline{z}_0}{z - \overline{z}_0} \right) \left(\frac{N_1}{N_0 - N_1} \right)} \right], \qquad \alpha_0 \equiv \frac{z}{z - \overline{z}_0}. \quad (B.17)$$

If we abstract from the term in the last square bracket, we see that the factors affecting the degree of self-financing are the same as those reported in (B.13) in the case where the marginal tax rate is cut for all taxpayers above a certain level. From (B.15) we see that the term $\left(\frac{\overline{z}_1 - \overline{z}_0}{z - \overline{z}_0} \right) \left(\frac{N_1}{N_0 - N_1} \right)$ in the denominator of the square bracket in (B.17) is the ratio of the tax relief for taxpayers who do not experience a cut in their marginal tax rate to the tax relief for those who do. This term is seen to reduce the degree of self-financing, reflecting that taxpayers with incomes above the new progressivity threshold benefit from a lower tax on their intra-marginal income but do not face any improvement in their incentives to earn income, since their marginal tax rate is unchanged. Essentially these taxpayers just receive a lump sum transfer which increases the static revenue loss relative to the dynamic revenue gain.

According to formula (B.13) the degree of self-financing associated with a cut in the marginal tax rate for labour income above some threshold $\overline{z}$ depends on the initial marginal effective tax rate (m_0)

for the group of affected taxpayers, on the elasticity of their taxable income (ε), and on the parameter α which measures the ratio between the change in the marginal tax rate (*dm*) and the change in the average tax rate (*da*) for the affected taxpayers. With a higher initial marginal tax rate, any given cut in that rate will imply a larger relative increase in the marginal after-tax wage and will therefore generate a stronger increase in the tax base via increased labour supply etc. Moreover, since a higher elasticity of taxable income reflects a stronger behavioural response to any given relative increase in the marginal after-tax wage, it will also imply a greater expansion of the tax base and hence a higher *DSF*. The role of α $(= dm/da)$ may be explained as follows: the initial static revenue loss from the cut in m is determined by the resulting fall in the *average* tax rate which measures the drop in total tax payments relative to pre-tax income. By contrast, the behavioural response generating the dynamic revenue gain depends on the change in the *marginal* tax rate. Therefore, the greater the ratio dm/da, the larger is the dynamic revenue gain relative to the initial revenue loss (see also Box 6.2 for a complementary intuitive explanation for the role of α).

Formula (B.17) in Box 6.2 allows an estimation of the degree of self-financing associated with an alternative tax policy experiment where the income threshold for the payment of a progressive surtax is changed, but where the marginal tax rates below and above the threshold remain the same. An example of such an experiment could be the increase in the income threshold for the progressive central government income tax which was implemented in Sweden from the start of 2009. Like (B.13), formula (B.17) abstracts from the effects of a tax change on labour force participation, since such effects are likely to be small for individuals with a high earnings potential. Since a rise in the income threshold for a progressive surtax implies a fall in the marginal tax rate for taxpayers with an income between the old and the new threshold, it is not surprising to see from (B.17) that the formula for the *DSF* includes the same factors as those determining the *DSF* when the marginal tax rate above some income level is cut. In addition, (B.17) shows that the *DSF* varies positively with the number of taxpayers with incomes between the old and the new progressivity threshold relative to the number of taxpayers above it. The reason is that taxpayers in the former group get a cut in

their marginal tax rate, whereas members of the latter group do not: they simply get a cut in their total tax bill, but they still face the same marginal tax rate and hence have no additional incentive to raise their income.

Let us now consider some applications of the formulas in Box 6.2.

Would an abolition of the" värnskatt" pay for itself?

Formula (B.13) may be applied to the case of the Swedish "värnskatt", that is, the 5 percent surtax on high-income earners. In 2008 the värnskatt was levied on assessed incomes above 507,100 SEK, corresponding to a gross income before social security tax of 671,500 SEK. Hence we have $\bar{z} = 671,500$. The average gross income of taxpayers subject to the värnskatt was 979,100 SEK in 2008. On average across the group of affected taxpayers, a change dm in the rate of värnskatt (measured relative to gross income in 2008) would thus have changed the total tax bill by the amount $dm \cdot (979,100 - 671,500)$, implying a change in the average tax rate equal to $da = dm \cdot (979,100 - 671,500)/979,100 = 0.314 \cdot dm$. With these numbers we get $\alpha = dm/da = 1/0.314 = 3.185$. In Chapter 2 we briefly surveyed a number of recent empirical studies of the elasticity of taxable income in Sweden. On that basis we concluded that $\varepsilon = 0.2$ is probably a conservative estimate for this elasticity. Finally, in Table 6.2 we have estimated the total marginal effective tax rate on payers of the värnskatt to be 75.1 percent (in 2010), implying $m_0 = 0.751$. After an abolition of the värnskatt, we see from Table 6.2 that the marginal effective tax rate for top income earners would fall to $m_1 = 0.723$.

Using these estimates for α, ε, m_0 and m_1, formula (B.13) implies that the degree of self-financing in case of a cut in the värnskatt would be about 1.85. In other words, such a tax cut would not be far from from paying for itself twice! This estimate includes the dynamic gain from the increase in consumption tax revenue accruing as taxpayers spend the additional incomes from their extra work effort. If we ignore consumption taxes and use the numbers in the two bottom rows of the fourth column of Table 6.1 as our estimates for m_0 and m_1 (although economic theory prescribes that we should in fact include consumption taxes in an estimate of the total tax burden on labour), formula (B.13) yields a

DSF of about 1.23 in case of a cut in the värnskatt; still considerably above one. The finding that an abolition of the värnskatt could actually increase total revenue due to the behavioural responses is in line with the analysis by Holmlund and Söderström (2007) who reached a similar conclusion, using a different method of estimating the *DSF*.

While the relevant values of the parameters α and m can be established with a relatively high degree of certainty, there is still considerable uncertainty about the size of the elasticity of taxable income, ε. It is therefore of interest to investigate how high this elasticity has to be to ensure that a marginal tax rate cut will indeed pay for itself. This critical value of ε, denoted ε^c, may be found by setting the *DSF* in formula (B.13) equal to one and solving for ε. Doing so, we find that

$$\varepsilon^c = \left(\frac{1-m_0}{m_1}\right)\frac{1}{\alpha}. \tag{4}$$

Using our previous estimates ($m_0 = 0.751,\ m_1 = 0.723,\ \alpha = 3.185$), we find that the elasticity of taxable income has to be at least $\varepsilon^c = 0.11$ for an abolition of the värnskatt to be fully self-financing. This number is quite close to the value often assumed in Sweden for the conventional net wage elasticity of hours worked (i.e. the conventional elasticity of labour supply at the intensive margin). For example, in the calculations by Konjunkturinstituttet (KI) referred to earlier (Finanspolitiska Rådet, 2008, p. 199), the hours-of-work elasticity is assumed to be 0.1. With this assumption, KI estimated that the *DSF* associated with an abolition of the värnskatt would be 0.56. However, this estimate was based on values of m_0 and m_1 which only included a part of the social security tax and which assumed a lower effective consumption tax rate than the one estimated in this report. If we set $\varepsilon = 0.1$, in line with the assumption made by the KI, our formula (B.13) predicts a *DSF* equal to 0.91, given our previous estimates of m_0 and m_1. These numerical examples show the great importance of the magnitude of the initial marginal effective tax rate for the degree to which labour income tax cuts will pay for themselves.

Using the more sophisticated formula (B.14) in Box 6.2 would only tend to strengthen the conclusion that an abolition of the

värnskatt would almost certainly pay for itself. Essentially, the first term in (B.14) is just a decomposition of the revenue gain from the behavioral responses on the intensive margin of labour supply already captured by (B.13). The second term in (B.14) adds the dynamic revenue gain from the labour supply response on the extensive margin which was ignored by formula (B.13). Although this response (depending on the participation elasticity) is probably very small within the group of high-income earners, it is certainly non-negative.

Raising the progressivity threshold: how much revenue would be recouped?

An alternative way of implementing tax cuts in the upper part of the income distribution would be to raise the income thresholds where the progressive surtaxes start to apply. A direct way of doing this would be to raise the threshold for the income tax paid to the central government or the threshold for the värnskatt, while keeping the marginal tax rates above the thresholds unchanged. A more indirect way of raising the progressivity threshold would be to raise the income level where social security benefits are capped. In this way the government could raise the threshold where the social security contribution starts to work like a genuine tax.

For example, let us apply formula (B.17) in Box 6.2 to estimate the degree of self-financing in case social security benefits were capped at the income threshold for the värnskatt rather than at the somewhat lower income level where the entitlement to additional retirement benefit is currently capped. According to Table 6.1, this would imply a cut in the marginal effective tax rate from 72.3 percent to 54.3 percent for taxpayers within this income interval, so in terms of formula (B.17) one would have $m_0 = 0.723$ and $m_1 = 0.543$. If such a reform had been implemented in 2008, it would have reduced the effective tax bill of about 1,113,000 taxpayers with a gross income above the level of 476,700 SEK where entitlement to additional retirement benefits was capped in 2008. About 378,700 of these taxpayers had a gross income above the 671,500 SEK threshold for the värnskatt, so the reform would only have lowered the effective marginal tax rate for about 1,113,000-378,700 = 734,300 taxpayers, i.e., for those with a gross income between 476,700 SEK and 671,500 SEK, according to

income distribution data provided by the Swedish Ministry of Finance. The taxpayers in this interval had an average gross income of 534,400 SEK in 2008.

Using these numbers in formula (B.17) and maintaining the assumption that the elasticity of taxable income is 0.2, one finds a degree of self-financing of about 1.32 in case of a rise in the income threshold where social security benefits are capped. The critical minimum elasticity value where the reform would be just self-financing may be found by setting $DSF = 1$ in formula (B.17) and solving for ε. Performing this exercise and inserting the figures mentioned above, we find that the reform would be fully self-financing for any elasticity of taxable income above 0.152.

These numbers suggest that the degree of self-financing associated with a rise in a progressivity threshold would be quite high, but not as high as the *DSF* for a cut in the top marginal tax rate. The reason for the difference is that taxpayers with an income above the new (higher) progressivity threshold get a cut in their total tax bill but still face the same marginal tax rate, so a part of the static revenue loss comes from a tax cut for individuals whose incentives to earn additional income do not improve. By contrast, when the marginal tax rate above some income level is lowered, all taxpayers above that earnings level face a stronger incentive to raise their income.

Against this background it is surprising that Konjunktur-institutet (KI) has estimated a higher degree of self-financing if the income threshold for the progressive central government income tax is raised than if the värnskatt is abolished. Part of the explanation for this finding could be that the KI only includes a rather low indirect tax rate in the estimated total marginal effective labour income tax rate. Since the formulas in Box 6.2 imply that the *DSF* increases more than proportionally with the level of the initial marginal tax rate, this low indirect tax rate could yield a bias in the comparison of the estimated *DSF* for different tax policy experiments. However, presumably the main explanation for the difference between our results and those found by Konjunktur-insitutet is that the calculations by the KI assume a positive effect of tax cuts on labour force participation. Since the incentive to participate depends on the average rather than the marginal tax rate (see formula (B.14) in Box 6.2), a rise in the progressivity threshold will stimulate participation even by taxpayers above the new threshold. If the participation elasticity and/or the

participation tax rate (the magnitude $a+b$ in (B.14)) is higher for individuals with incomes close to the progressivity threshold than for taxpayers further up the income distribution, the effects on labour force participation could dominate the effect on the intensive margin of labour supply in a comparison of the two tax policy experiments discussed here, thus explaining the finding by KI. However, for individuals with a high potential income the incentive to participate in the labour market is so strong that almost all of them can be expected to participate from the outset, so in practice one would expect to find very small participation effects of a tax cut for this group. In that case our formula (B.17) would provide a good approximation of the effects of raising a progressivity threshold, and the *DSF* for such an experiment would then be lower than the *DSF* in case of a cut in the top marginal tax rate, as we have seen.

A final word of caution

Since formula (B.14) accounts for the impact of tax changes on labour force participation, one may apply it to all the different income groups and calculate appropriate weighted averages to estimate the degree of self-financing associated with alternative tax policy experiments such as an increase in the Earned Income Tax Credit. Such exercises require access to and handling of detailed micro data bases and therefore go beyond the scope of the present report. However, as indicated by the analysis in Box 6.1 and 6.2, the effects of labour income tax cuts at different points on the income ladder – and hence the effects of a restructuring of the labour income tax - depend very much on the relative magnitude of labour supply responses on the extensive and the intensive margins. The amount of uncertainty regarding these crucial parameters warrants caution when predicting the effects on economic efficiency of changes in the labour income tax schedule. On top of this, the design of an "optimal" tax schedule is hampered by uncertainty regarding the distributional preferences of policy makers (i.e., what is the "social value" of additional net income in different income groups).

6.4 Summary and policy proposals

This chapter discussed the optimal design of taxes on labour income when the government worries about economic efficiency (the total "size of the pie" available to society) as well as equity (the actual distribution of the pie). We identified a number of factors that should be taken into account if policy makers want to trade off the goal of equity against the goal of efficiency in a rational manner. These factors include the distribution of earnings capacities across taxpayers and the impact of taxation on the various margins of labour supply as well as society's valuation of income gains for the different income groups.

In particular, we saw that the outcome of the optimal trade-off between equity and efficiency will depend very much on the way work efforts respond to a change in tax rates. If labour force participation is insensitive to economic incentives whereas the work efforts of those already employed is not, we found that the optimal tax-transfer system in an egalitarian society involves generous transfers to people outside the labour market combined with a rapid phase-out of transfers to low-income wage earners as they raise their labour income.

By contrast, if labour force participation responds significantly to the net income gain from employment whereas the effort of those already employed is not very sensitive to a lower tax on the last krona earned, we saw that it might be optimal to encourage labour force participation through an Earned Income Tax Credit even though the resulting revenue loss will require higher marginal tax rates than would otherwise be needed.

Given the considerable uncertainty regarding labour supply responses at the different margins as well as uncertainty regarding the distributional goals of policy makers, it is difficult to evaluate the social gain or loss from a reshuffling of the labour income tax burden across taxpayers. However, our analysis did suggest that even on rather conservative assumptions regarding behavioural responses, the very high marginal effective tax rate at the upper end of the Swedish income distribution means that an abolition of the värnskatt imposed on high-income earners will more than fully pay for itself via the dynamic increase in the tax base. In such a situation there is no trade-off between equity and efficiency since the net revenue gain will enable the government to make everyone better off. Our analysis therefore leads us to suggest that the

värnskatt be abolished. Despite the uncertainty regarding the responsiveness of the tax base to a lower marginal tax rate, the risk involved in such a policy experiment is limited because of the relatively low revenue from the värnskatt. Moreover, in contrast to earlier findings, our analysis indicated that the degree of self-financing (*DSF*) in case of an abolition of the värnskatt would be higher than the *DSF* associated with an increase in the income threshold for the progressive central government income tax or an increase in the income level where social security benefits are capped.

Our description of current tax rules also showed that the Earned Income Tax Credit (jobbskatteavdraget) as well as the standard deduction (grundavdraget) vary with income in a complex manner which may be hard to grasp for the ordinary taxpayer. In particular, we saw that the standard deduction reduces the base for calculating the EITC in a way that neutralizes the effect of the income-dependency of the standard deduction for wage earners. Hence the income-dependency of the standard decuction only matters for the average tax rate imposed on recipients of transfer incomes, since transfers affect the base for the calculation of the income-dependent standard deduction. The latter fact implies that a change in the taxpayer's transfer income may influence the size of his EITC in a manner which may not be immediately clear to him. As a consequence of this complexity, the incentives embodied in effective marginal tax rate schedule are probably hard for taxpayers to figure out, and hence they may not (fully) respond to these incentives in the way intended by policy makers. Since the effect of the standard deduction on the average and marginal tax rates of wage earners is fully offset by the way in which the EITC is designed, it seems desirable to simplify the personal labour income tax through a replacement of the current income-dependent standard deduction by an identical flat deduction for all taxpayers. The implications of this simplification for the distribution of income among transfer recipients may have to be countered through appropriate adjustments of the rates of transfer.

7 The taxation of income from saving and investment

The way a country allocates its savings and investment can have important effects on its living standard. If the tax system causes capital to be channeled to low-productive uses, national income will be lower than it could have been. This chapter investigates how taxes distort the allocation of savings and investment in Sweden.

Capital taxes accounted for 11 percent of total tax revenue in 2008, as shown by Table 7.1. Since many forms of capital income are highly sensitive to the business cycle, the revenue from capital taxes was relatively low in the recession year of 2008. For comparison, these taxes generated 14.1 percent of total revenue in 2007. The most important capital tax is the corporate income tax which produces roughly half of all revenue from taxes on capital. As we explained in Chapter 4, the corporate income tax can be seen as a tax on capital invested in Sweden, including foreign-owned capital. In principle, the other taxes recorded in Table 7.1 such as the personal capital income tax and the tax on returns to pension savings are taxes on capital owned by Swedish residents, that is, they are taxes on saving.

One of the major goals of the Swedish tax reform of 1991 was to reduce the heavy tax distortions to savings and investment incentives that had been pointed out by many tax experts and government committees in the years before the reform. A guiding principle of the Tax Reform of the Century was that the tax system should be neutral in its treatment of the various forms of income from saving and investment.

This chapter will argue that "neutrality" in capital income taxation is still a highly relevant and worthy goal of tax policy. The chapter will also identify a number of non-neutralities in the current system of capital income taxation in Sweden and will

propose ways of eliminating these distortions to achieve a more efficient (and arguably also a fairer) capital income tax regime.

A basic premise for our discussion is that Sweden should maintain the dual income system which combines progressive taxation of labour income with a relatively low flat tax rate on capital income and corporate income. The case for the dual income tax was laid out in Chapter 2 and will not be repeated here. Instead the present chapter will discuss how capital income taxes should be designed, given that some amount of revenue has to be raised from this source. We will also briefly discuss the proper overall level of capital income taxation in the Swedish context.

Table 7.1 Taxes on saving and investment in Sweden, 2008[1]

	Revenue (billion SEK)	Percent of total tax revenue	Percent of GDP
Personal capital income tax	26	1.7	0.8
Tax on return to pension savings (avkastningsskatt)	15	1.0	0.5
Property tax	24	1.6	0.8
Stamp duties	9	0.6	0.3
Corporate income tax	83	5.6	2.6
Other capital taxes	6	0.4	0.2
Total taxes on income from saving and investment	163	11.0	5.2

[1] Rounded numbers.

Source: Ministry of Finance, Stockholm.

To set the stage for our discussion of the need for a reform of capital income taxation, sections 7.1 and 7.2 will offer rough estimates of the loss of economic efficiency resulting from the major non-neutralities in the current Swedish system of capital income taxation. These deadweight losses arise from 1) the differential taxation of different forms of financial saving, 2) the tax-favoured status of savings invested in owner-occupied housing, 3) the differential taxation of different forms of business organization, 4) the tax discrimination in favour of debt finance under the corporate income tax, and 5) the investment distortion caused by source-based taxation of the normal return to capital under the corporate income tax. Sections 7.3 and 7.4 will then lay out a number of proposals intended to eliminate or at least reduce

these tax distortions. In Section 7.5 we summarise the main findings and policy proposals in the chapter.

7.1 The deadweight loss from non-neutral taxation of savings in Sweden

In this section we explain why the non-neutral taxation of the main forms of household savings distorts the composition of savings. In particular, we focus on the tax-favoured status of retirement savings and savings channeled into owner-occupied housing and describe how one may estimate the size of the resulting deadweight losses.

Tax distortions to portfolio composition

A part of the financial saving of households is invested by the savers themselves in bank accounts, bonds and stocks etc. However, more than half of total financial saving is channelled through institutions such as pension funds and life insurance companies that invest the funds on behalf of the savers. In the following, we shall refer to the former type of saving as "free" financial saving, while the latter type will be termed "institutional" saving. Even when the two forms of saving are invested in the same type of financial assets, they are likely to be imperfect substitutes in the eyes of savers, since institutional saving tends to be less liquid than free saving, and since it is typically combined with some form of life insurance and disability insurance.

Under the current Swedish tax system the nominal return to free financial saving is taxed at the ordinary flat personal capital income tax rate of 30 percent. In contrast, institutional saving is subject to a special 15 percent tax rate on an imputed rate of return on the value of the net assets held by pension funds and life insurance companies at the start of the year (the so-called avkastningsskatt).[37] The rate of return imputed to the asset basis equals the average nominal interest rate on long-term government bonds during the preceding year.

[37] A very small part of institutional saving (so-called kapitalförsäkringar) is actually taxed at 27 percent on an imputed return. In the calculations below we neglect this complication since it is quantitatively unimportant.

Thus the tax rate on the return to institutional saving is only about half as high as the tax rate on the return to free saving. This tax discrimination will tend to distort the private sector's portfolio composition in favour of institutional saving. In Box 7.1 we show that if the marginal effective tax rate on the two forms of financial saving were equalized, the government would be able to increase its total revenue without reducing the average after-tax return to financial saving, and hence without reducing the welfare of savers. The revenue gain from the move to uniform taxation of all returns to saving would therefore represent a pure gain in economic efficiency, so it is a measure of the deadweight loss from non-uniform taxation.

The intuition for this result may be explained as follows: From the perspective of consumers, the value of a given form of saving stems partly from its pecuniary after-tax return and partly from the liquidity services and insurance services etc. that it generates. Rational households will rearrange their portfolios until the different forms of saving create the same value at the margin. Because the monetary return to 'free' financial saving is more heavily taxed, it must generate a higher marginal value before tax to be just as attractive as institutional saving. When the tax rates on the monetary returns to the two forms of saving are equalized, consumers reallocate a part of their portfolios away from institutional saving towards free saving which has a higher marginal pre-tax value. Measured before tax, the total value of the marginal unit of saving therefore goes up, and this enables the government to collect a higher amount of tax on the pecuniary return to saving without reducing its after-tax value to consumers.

Box 7.1 The deadweight loss from tax distortions to portfolio composition

How can we measure the deadweight loss from the non-neutral tax treatment of different forms of financial saving? This box offers an answer to this question. We distinguish between 'free' financial saving via bank accounts and via direct purchases of bonds and stocks etc., and 'institutional' saving channelled through institutional investors such as pension funds and life insurance companies. For the reasons explained in the main text, the two forms of saving are likely to be imperfect

Box 7.1 cont.
substitutes in the eyes of consumers. To capture this, we specify total financial saving (S^f) as the following CES aggregate of institutional saving (S^I) and free saving (S^F), where ϕ is the elasticity of substitution between the two forms of saving:

$$S^f = \left[\gamma^{-1/\phi} \left(S^I\right)^{(\phi+1)/\phi} + (1-\gamma)^{-1/\phi} \left(S^F\right)^{(\phi+1)/\phi} \right]^{\frac{\phi}{\phi+1}}, \qquad 0<\gamma<1. \quad \text{(B.1)}$$

If r is the pre-tax return to financial saving and t^r is an 'aggregate' effective tax rate on its return (to be derived below), the representative household's total after-tax income from financial saving is given by

$$r\left(1-t^r\right)S^f = r\left(1-t^I\right)S^I + r\left(1-t^F\right)S^F, \quad \text{(B.2)}$$

where t^I and t^F are the effective tax rates on the real returns to institutional and free savings, respectively. To maximise utility, the household must allocate any given total amount of financial saving across the two components S^I and S^F so as to maximise the total after-tax financial income specified in (B.2), subject to the constraint given by (B.1). The solution to this problem yields:

$$S^I = \left(\frac{1-t^I}{1-t^r}\right)^{\phi} \gamma S^f, \quad \text{(B.3)}$$

$$S^F = \left(\frac{1-t^F}{1-t^r}\right)^{\phi} (1-\gamma) S^f, \quad \text{(B.4)}$$

$$1-t^r = \left\{ \gamma\left(1-t^I\right)^{\phi+1} + (1-\gamma)\left(1-t^F\right)^{\phi+1} \right\}^{\frac{1}{\phi+1}}. \quad \text{(B.5)}$$

Equation (B.5) determines the aggregate effective capital income tax rate t^r as a function of the effective tax rates on the two forms of financial saving, given that households optimise their portfolio composition.

We will now show that a switch to uniform taxation of the return to alternative forms of financial saving would enable the government to collect additional tax revenue without reducing

Box 7.1 cont.
the overall return to saving and hence without reducing consumer welfare. The additional revenue is therefore a measure of the efficiency loss from non-neutral taxation of savings.

From (B.3) and (B.4) it follows that the total revenue from taxes on the return to financial saving is

$$R^S = t^I r S^I + t^F r S^F = \left[\gamma t^I \left(\frac{1-t^I}{1-t^r} \right)^{\phi} + (1-\gamma) t^F \left(\frac{1-t^F}{1-t^r} \right)^{\phi} \right] r S^f. \qquad \text{(B.6)}$$

Assume now that the marginal effective tax rates t^I and t^F are equalized at a level equal to the initial aggregate effective capital income tax rate t^r so that the overall after-tax return to saving $r\left(1-t^r\right)$ - and hence aggregate financial saving S^f - are unchanged. According to (B.5) we then have

$$dt^r = 0 \quad \Rightarrow \quad \gamma\left(1-t^I\right)^{\phi} dt^I + (1-\gamma)\left(1-t^F\right)^{\phi} dt^F = 0 \quad \Leftrightarrow$$

$$dt^F = -\left(\frac{\gamma}{1-\gamma} \right)\left(\frac{1-t^I}{1-t^F} \right)^{\phi} \cdot dt^I. \qquad \text{(B.7)}$$

Since (B.7) ensures constancy of t^r and S^f, equation (B.6) implies

$$\frac{dR^S}{rS^f} = \left(1-t^r\right)^{-\phi}\left\{\gamma\left[\left(1-t^I\right)^{\phi} - \phi t^I\left(1-t^I\right)^{\phi-1}\right]dt^I + (1-\gamma)\left[\left(1-t^F\right)^{\phi} - \phi t^F\left(1-t^F\right)^{\phi-1}\right]dt^F\right\}. \qquad \text{(B.8)}$$

Substituting (B.7) into (B.8) and rearranging, and using the fact that equalization of the two tax rates implies $dt^I = t^r - t^I$, we get

$$\frac{dR^S}{rS^f} = \gamma\phi\left(\frac{1-t^I}{1-t^r} \right)^{\phi}\left(\frac{t^F}{1-t^F} - \frac{t^I}{1-t^I} \right)\left(t^r - t^I\right) > 0. \qquad \text{(B.9)}$$

The positive sign of the expression in (B.9) follows from (B.5) which implies that if $t^F > t^I$ we have $t^r > t^I$, and vice versa. This proves that a move towards uniform taxation of alternative forms of saving will always improve economic efficiency, since the revenue gain in (B.9) is achieved without reducing the

Box 7.1 cont.
overall after-tax return to saving accruing to households. The intuition for this result is explained in the main text.

To estimate the deadweight loss from non-neutral tax treatment of different forms of financial saving, one needs an estimate of the weight parameter γ in (B.9). This may be obtained by rearranging (B.3) and (B.4) and using (B.2) and (B.5) to find

$$\gamma = s^I \left(1-t^I\right)^{-(\phi+1)} \hat{\theta}, \qquad 1-\gamma = \left(1-s^I\right)\left(1-t^F\right)^{-(\phi+1)} \hat{\theta}, \quad \text{(B.10)}$$

$$s^I \equiv \frac{1}{1+\left(\frac{1-t^F}{1-t^I}\right)\left(\frac{S^F}{S^I}\right)}, \qquad \hat{\theta} \equiv \gamma\left(1-t^I\right)^{\phi+1} + (1-\gamma)\left(1-t^F\right)^{\phi+1}. \quad \text{(B.11)}$$

Adding the two equations in (B.10) and solving for $\hat{\theta}$, one gets

$$\hat{\theta} = \frac{1}{s^I \left(1-t^I\right)^{-(\phi+1)} + \left(1-s^I\right)\left(1-t^F\right)^{-(\phi+1)}}. \quad \text{(B.12)}$$

If t_s^I and t_s^F are the statutory rates of tax on the *nominal* return to the two forms of saving, and π is the rate of inflation, the implied tax rates on the real rates of return are given as

$$t^I \equiv \frac{t_s^I\left(r+\pi\right)}{r}, \qquad t^F \equiv \frac{t_s^F\left(r+\pi\right)}{r}. \quad \text{(B.13)}$$

From these relationships plus the empirically observable ratio $S^F/S^I = (r+\pi)S^F/(r+\pi)S^I$ for which data are assumed to be available, one can calculate the value of the fraction s^I appearing in (B.11). Using (B.10) and (B.12) one may then derive γ, given some estimated/assumed value of the substitution elasticity ϕ.

To apply formula (B.9) in Box 7.1 to estimate the size of the efficiency gain from a move towards uniform taxation, we need to estimate the marginal effective tax rates on the two forms of saving. As shown by the two formulas in (B.13), the effective tax rates on the real return to savings differ from the statutory rates because taxes are levied on the full nominal return to saving,

including the part that only compensates for inflation. In Sweden, the statutory tax rate on the nominal return to free saving (t_s^F) is 30 percent, and the statutory tax rate on the (imputed) nominal return to institutional saving (t_s^I) is 15 percent. We assume that the long-run annual rate of inflation (π) is 2 percent and that the average real rate of return to saving (r) is 5 percent which should be thought of as an average return across risk-free and risky assets.
With these assumptions it follows from (B.13) in Box 7.1 that the marginal effective tax rates on institutional saving and free saving are 21 percent and 42 percent, respectively. When applying formula (B.9) we also need a value for the parameter γ which reflects the strength of consumer preferences for institutional saving. The value of γ may be estimated in the manner described in Box 7.1, based on data for the relative volume of institutional saving and free saving plus an assumption on the elasticity of substitution (ϕ) between the two forms of saving. As a benchmark, we consider the case where $\phi = 1$ which implies that the income from each form of saving makes up a constant share of total savings income. With these assumptions formula (B.5) in Box 7.1 implies that the weighted average of the marginal effective tax rates on the real return to the two forms of saving (t^r) is 31.5 percent. From equation (B.9) we then find that the deadweight loss from the non-uniform taxation of the different forms of financial saving is about 2.4 percent of the total real pre-tax income from financial savings. In 2008 this total real income amounted to about 139 billion SEK (see Sørensen, 2010, p. 77), implying that the efficiency loss from non-uniform taxation of financial saving was roughly 3.4 billion SEK. Since 2008 was a recession year characterized by big capital losses on stocks, this number probably underestimates the magnitude of the deadweight loss in a normal year. Further, since contributions to pension savings schemes are deductible while pensions are taxable, the effective tax rate on the return to pension savings will be reduced to the extent that the marginal income tax rate at the time of contribution is higher than the marginal tax rate at the time pensions are received. Our estimate of the effective tax rate on institutional saving ignored this complicating factor, so this is another reason why our analysis may underestimate the deadweight loss from the tax favours to this form of saving.

Because of the uncertainty regarding the actual value of the substitution elasticity between institutional and free saving, the above estimate of the deadweight loss is of course also uncertain,

but it does suggest that the social loss from the current non-neutral taxation of savings income in Sweden is non-negligible. In fairness, it should be added that most other countries do not tax the return to institutional saving at all, implying an even greater deadweight loss than the one estimated here for Sweden.

The deadweight loss from tax subsidies to owner-occupied housing

A large part of total household saving is invested in owner-occupied residential property. The real return to this form of saving takes the form of the value of the housing services generated by residential property plus any real capital gain on the property. Assuming that real capital gains are zero on average over the long run, Sørensen (2010, p. 77) estimates that about 56 percent of the total real pre-tax return to household saving in Sweden consists of the return on investment in owner-occupied residential property. As we shall see, the current Swedish tax system subsidises this form of investment, thereby generating a loss of economic efficiency, because housing investment becomes attractive to households even though the marginal social value (that is, the pre-tax value) of housing services is relatively low compared to the social value of other forms of consumption.

The deadweight loss from the tax subsidies to owner-occupied housing stems from two sources. First, the pattern of housing consumption is distorted in favour of owner-occupied housing as opposed to rental housing. Second, the overall pattern of consumption is distorted in favour of housing consumption at the expense of consumption of other goods and services.

To understand the nature of these tax distortions, it is useful to consider the so-called user costs of owner-occupied and rental housing services, denoted by p_H and p_h, respectively. For a tenant, the user cost of housing simply consists of the rent paid for his apartment. In a long-run economic equilibrium, the rent must cover the landlord's cost of financing and maintaining the apartment plus his property tax bill. A long-run equilibrium also requires that the price of an existing piece of residential property equals the cost of constructing a new housing unit of the same size and quality. If we choose our units of measurement such that the cost of constructing a unit of housing is one, and if the VAT rate on construction activity is p_h, the price an investor must pay to

acquire a unit of residential property is therefore equal to $1+t^H$. The landlord's capital cost of acquiring a unit of residential property is thus equal to $r\left(1+t^H\right)$, where r is the real interest rate. Suppose further that the cost of maintaining a unit of housing is δ kronor per year (exclusive of VAT) so that the VAT-inclusive maintenance cost is $\delta\left(1+t^H\right)$ kronor, and suppose finally that the property tax payable on a unit of rental property is τ^h measured relative to the market price of the property. The user cost of a unit of rental property then becomes

$$p_h = \overbrace{r\left(1+t^H\right)}^{\text{cost of finance}} + \overbrace{\delta\left(1+t^H\right)}^{\text{cost of maintenance}} + \overbrace{\tau^h\left(1+t^H\right)}^{\text{property tax bill}} = \left(1+t^H\right)\left(r+\tau^h+\delta\right). \qquad (1)$$

Note that even though the landlord may deduct his operating and financing costs from his income tax base, this benefit is exactly offset by the income tax on his rental income. Hence the capital income tax rate does not affect the user cost of rental housing.

The situation is different for owner-occupiers who are not taxed on the imputed rent (the value of the housing service) from their property even though they are allowed to deduct mortgage interest payments from their capital income tax base, and even though their opportunity cost of investing their net wealth in residential property is reduced by the capital income tax on the return to the financial assets in which they might alternatively have invested. With an effective capital income tax rate t^r on real interest income and a corresponding tax relief from interest deductibility, the user cost of a unit of owner-occupied housing is therefore equal to

$$p_H = \overbrace{r\left(1-t^r\right)\left(1+t^H\right)}^{\text{cost of finance}} + \overbrace{\delta\left(1+t^H\right)}^{\text{cost of maintenance}} + \overbrace{\tau^H\left(1+t^H\right)}^{\text{property tax bill}} = \left(1+t^H\right)\left[r\left(1-t^r\right)+\delta+\tau^H\right], \qquad (2)$$

where τ^H is the effective property tax rate on owner-occupied housing, measuring the property tax bill relative to the current market price $1+t^H$.

From (1) and (2) we can see how the tax system affects the consumer price of housing services in the long run. In particular, we see that the personal capital income tax and the associated deductibility of mortgage interest payments reduces the user cost of owner-occupied housing through the term $-rt^r$ in (2). Unless the effective property tax rate on owner-occupied housing exceeds

the effective property tax rate on rental housing by the amount rt^r, the tax system will therefore reduce the cost of owner-occupied housing relative to the cost of rental housing. In that case households will be induced to consume "too many" housing services from owner-occupied relative to rental property.[38]

Box 7.2 describes how one may measure the resulting loss of economic efficiency. The source of the deadweight loss is that, while it is equally costly to construct a unit of rental housing and a unit of owner-occupied housing, the tax system induces consumers to expand their consumption of the latter form of housing to a point where its marginal utility value is lower than the marginal utility value of rental housing. If consumers could somehow be motivated to shift from owner-occupied to rental housing, the total utility value of housing services would therefore go up without any increase in total construction costs. The increase in the aggregate value of housing services would thus represent an economic gain to society. However, as long as the tax system subsidises owner-occupied housing, consumers have no private incentive to undertake such an efficiency-improving substitution towards rental housing.

Box 7.2 The deadweight loss from the non-neutral tax treatment of rental and owner-occupied housing

To capture the fact that rental and owner-occupied housing are likely to be imperfect substitutes, let us specify the total consumption of housing services (C_H) as a CES aggregate of services from owner-occupied housing (H) and services from rental housing (h), with a substitution elasticity σ_h between the two types of housing:

$$C_H = \left[\eta^{1/\sigma_h} H^{(\sigma_h-1)/\sigma_h} + (1-\eta)^{1/\sigma_h} h^{(\sigma_h-1)/\sigma_h} \right]^{\frac{\sigma_h}{\sigma_h-1}}, \qquad 0<\eta<1. \quad \text{(B.14)}$$

Utility-maximising consumers will allocate their housing expenses across rental and owner-occupied housing so as to minimise the total expenditure needed to attain a given level of

[38] Rent controls artificially reducing the cost of rental housing may work in the opposite direction. We return to this issue below.

Box 7.2 cont.

overall housing consumption. From (B.14) one can show that such cost-minimising consumer behaviour implies that

$$H = \eta \left(\frac{p_H}{P_H} \right)^{-\sigma_h} C_H, \tag{B.15}$$

$$h = (1-\eta) \left(\frac{p_h}{P_H} \right)^{-\sigma_h} C_H, \tag{B.16}$$

$$P_H = \left[\eta p_H^{1-\sigma_h} + (1-\eta) p_h^{1-\sigma_h} \right]^{\frac{1}{1-\sigma_h}}, \tag{B.17}$$

where p_h and p_H are the user costs of rental and owner-occupied housing services, given by equations (1) and (2) in the main text, and P_H is an index of the overall cost of housing services. According to (B.15) and (B.16) a rise in the relative cost of one form of housing will induce consumers to substitute towards the other type of housing.

Consider now a property tax reform that equalizes the user cost of the two types of housing service in a way which keeps the overall cost of housing (P_H) and thereby consumer welfare constant. If such a reform generates additional tax revenue, the revenue gain is a measure of the deadweight loss from non-neutral taxation of the different forms of housing. As shown by Sørensen (2010, pp. 38-39), equations (B.15) through (B.17) imply that the revenue gain from the property tax reform relative to the value of total housing consumption ($dR / P_H C_H$) is given by the expression

$$\frac{dR}{P_H C_H} = \overbrace{\sigma_h \eta \left(\frac{p_H}{P_H} \right)^{1-\sigma_h} \left[\left(\frac{\delta t^H + (1+t^H)\tau^h}{p_h} \right) - \left(\frac{\delta t^H + (1+t^H)(\tau^H - t^r r)}{p_H} \right) \right] \left(\frac{\tau_1^H - \tau_0^H}{p_H} \right)}^{\text{dynamic revenue gain from substitution towards the type of housing which was most heavily taxed initially}} > 0, \tag{B.18}$$

where τ_0^H and τ_1^H are the pre-form and the post-reform property tax rates on owner-occupied housing, respectively. To interpret (B.18), recall from the main text that t^H measures the fraction by which the VAT increases the consumer price of newly constructed housing as well as the cost of housing repair. Thus the magnitude $\delta t^H + (1+t^H)\tau^h$ is the total tax burden on

Box 7.2 cont.
rental housing, consisting of the VAT bill δt^H on expenses for housing repair plus the property tax bill $\left(1+t^H\right)\tau^h$ on a unit of rental housing. Similarly, $\delta t^H+\left(1+t^H\right)\left(\tau^H-t^r r\right)$ is the total tax burden on owner-occupied housing, accounting for the fact that the personal capital income tax and the associated deductibility of mortgage interest payments reduces the user cost by the amount $\left(1+t^H\right)t^r r$.

If $\tau^H-t^r r$ is initially lower than τ^h, a property tax reform equalizing the tax treatment (and thereby the user cost) of the two forms of housing must involve an increase in τ^H, and vice versa. This implies that the expression on the right-hand side of (B.18) will always be positive, so the move towards neutral taxation of all housing consumption will always improve economic efficiency. The intuitive explanation for this finding is given in the main text.

To apply formula (B.18) one must make an assumption on/use an estimate of the substitution elasticity σ_h. In addition, one needs an estimate of the parameter η reflecting the consumer preference for owner-occupied relative to rental housing. Sørensen (2010, pp. 44-45) shows how η may be estimated from data on the budget shares of owner-occupied and rental housing in total housing consumption, given an assumption on/estimate of σ_h. In the case considered in the main text where $\sigma_h=1$, it follows from (B.15) that η is simply equal to the budget share of owner-occupied housing, i.e., $\eta=p_H H/P_H C_H$.

Formula (B.18) in Box 7.2 allows a quantification of the efficiency gain from a property tax reform which equalizes the user costs of owner-occupied and rental housing while keeping the (weighted) average user cost of housing services constant so that overall consumer welfare is also preserved. Like before, the efficiency gain (= the deadweight loss from non-uniform taxation) is measured by the extra revenue that uniform taxation would enable the government to collect without reducing consumer welfare.

The estimates of the various parameters in formula (B.18) are documented in detail in Sørensen (2010, pp. 78-80). The effective property tax rate on owner-occupied housing (τ^H) is calculated as

the sum of the various taxes on owner-occupied property divided by the estimated market value of owner-occupied housing. The taxes include the ordinary property tax on owner-occupiers (fastighetsskatt), the tax on realized capital gains from the sale of owner-occupied residential property (reavinstskatt), the tax on deferred capital gains (ränta på uppskov), and stamp duties on transactions in owner-occupied residential property. In this way we arrive at an estimated effective property tax rate on owner-occupied housing equal to 0.68 percent in 2008.

To calculate the user cost of owner-occupied housing from equation (2), we also need an estimate of the effective marginal tax rate on real interest income, t^r. For households financing the acquisition of residential property out of their own savings, the relevant value of t^r is the effective tax rate on the real return to financial saving, estimated in the previous subsection to be 31.5 percent. Households financing the purchase of residential property through mortgage debt can deduct their nominal interest expenses from their capital income tax base. This base is taxed at the 30 percent ordinary statutory capital income tax rate, corresponding to an effective tax relief for the real interest payment equal to 42 percent, given the rates of interest and inflation assumed in the previous subsection. However, when the net nominal interest expense exceeds 100,000 SEK, only 70 percent of the excess amount is deductible. This limitation reduces the effective tax relief for mortgage interest payments, bringing the effective tax rate for net debtors closer to that for a net creditor who allocates his savings across 'free' financial saving (subject to the ordinary capital income tax) and institutional saving (benefiting from a lower tax rate). As a rough approximation, we therefore assume that the effective tax rate t^r in the user cost formula (2) is the same for net debtors and net creditors, i.e., $t^r = 31.5$ percent, as estimated in the previous subsection. With these assumptions plus the assumed real pre-tax interest rate of 5 percent, we find that the net direct tax burden on owner-occupied housing – measured by the magnitude $\tau^H - t^r r$ in (2) – is equal to minus 0.9 percent.

When estimating the effective property tax rate on rental housing (τ^h), we include the ordinary property tax on this form of housing and the stamp duties relating to rental property, but from these taxes we subtract the interest subsidies (räntebidrag) and investment subsidies given to rental property, since these subsidies reduce the user cost of this form of housing. Dividing the net tax

burden (taxes minus subsidies) by the total market value of rental property, our estimate of the effective property tax rate on rental property becomes 0.25 percent, based on data for 2008. This may be compared to the estimated net direct tax burden on owner-occupied housing of minus 0.9 percent. Thus there is hardly any doubt that the fiscal system does indeed favour owner-occupied housing, even when the uncertainty related to the above estimates is accounted for. The existence of the Value Added Tax does not change this conclusion, since VAT is levied at the same standard rate of 25 percent on the construction and maintenance of owner-occupied and rental property, so the VAT just increases the user cost of both forms of housing consumption by the same proportion.

To apply formula (B.18) in Box 7.2, we also need to make an assumption on the magnitude of the substitution elasticity σ_h between owner-occupied and rental housing, reflecting the degree to which consumers are willing to substitute between the two types of housing as their relative price changes. Unfortunately little is known about this substitution elasticity, but since it is presumably easier to substitute between different forms of housing than between housing services and other goods, we assume that $\sigma_h = 1.5$, a value slightly higher than the unit elasticity of substitution between housing and other goods assumed below. Using this value of σ_h in formula (B.18) along with the effective tax rates estimated above (and estimating the preference parameter η in the way described in Box 7.2), we find that the deadweight loss from the tax distortion to the pattern of housing consumption is about 1 percent of total household expenditure on housing services, corresponding to about 0.2 percent of total private consumption. In absolute terms, this amounts to a deadweight loss of roughly 3 billion SEK measured in 2008 prices.

This estimate does not account for the existence of rent controls which may in many cases reduce the cost of rental housing below the level implied by our user cost formula (1), thereby offsetting the tendency of the tax system to stimulate the demand for owner-occupied housing at the expense of rental housing. Our neglect of rent controls may mean that we overestimate the deadweight loss from the tax subsidy to owner-occupied housing. On the other hand, since owner-occupied and rental housing are likely to be relatively close substitutes, the substitution elasticity between them may be significantly higher than the value of 1.5

assumed above. In that case our estimate of the deadweight loss is likely to be too low, since formula (B.18) shows that the size of the loss varies in proportion to the magnitude of the substitution elasticity. Further, in our estimate of the user cost of rental housing we have included the interest subsidies (räntebidrag) paid out in 2008. These subsidies are in the process of being phased out and will be almost fully eliminated by 2012. In the absence of the interest subsidies the effective property tax rate on rental property for 2008 would have been 0.32 percent rather than the 0.25 percent assumed in our calculation, and the deadweight loss from the tax-favoured status of owner-occupied housing implied by formula (B.18) would have been 3.34 billion SEK rather than the 3 billion SEK mentioned above.

We have so far focused on the tax distortion to the pattern of housing consumption. However, the tax subsidy to owner-occupied housing may also distort the overall pattern of consumption in favour of consumption of housing services. The resulting deadweight loss may be measured in the way described in Box 7.3. The box presents a formula for the potential public revenue gain from a tax reform which equalizes the effective tax rate on housing consumption and other consumption at a level that keeps the overall consumer price level constant so that consumer welfare is also constant.

Box 7.3 The deadweight loss from the non-neutral tax treatment of housing consumption and other forms of consumption

In Chapter 5 we offered a method for quantifying the efficiency loss from differential taxation of non-housing consumer goods and services, and Box 7.2 presented a method of measuring the deadweight loss from differential taxation of different forms of housing. Using a similar methodology, we may measure the efficiency loss from non-uniform taxation of housing consumption and other consumption. Specifically, suppose the utility of the representative consumer's utility from total consumption (C) is given by the following CES aggregate of the consumption of housing services (C_H) and the consumption of other goods and services (C_o), with a

Box 7.3 cont.
substitution elasticity σ between the two types of consumption:

$$C = \left[\mu^{1/\sigma} C_H^{(\sigma-1)/\sigma} + (1-\mu)^{1/\sigma} C_o^{(\sigma-1)/\sigma} \right]^{\frac{\sigma}{\sigma-1}}, \qquad 0 < \mu < 1. \quad \text{(B.19)}$$

Optimising consumers will minimise the expenditure needed to attain a given level of utility. As reported by Sørensen (2010, p. 4), with P_H and P_o indicating the price indices for the two goods categories, such optimal consumer behaviour implies that

$$C_H = \mu \left(\frac{P_H}{P} \right)^{-\sigma} C, \qquad C_o = (1-\mu) \left(\frac{P_o}{P} \right)^{-\sigma} C, \qquad P = \left[\mu P_H^{1-\sigma} + (1-\mu) P_o^{1-\sigma} \right]^{\frac{1}{1-\sigma}}, \qquad \text{B.20)}$$

where P is the general consumer price index for all goods and services.
Since we now wish to abstract from the deadweight loss from differential taxation of the various types of housing (which was already captured by formula (B.18) in Box 7.2), we assume that the pre-tax value of all housing services $(r+\delta)$ is initially subject to a uniform tax at the rate $\overline{t}^H$, where the value of $\overline{t}^H$ is calibrated to ensure that the overall consumer price of housing services remains equal to its initial value, $\overline{P}^H$, so that

$$p_H = p_h = \left(1+\overline{t}^H\right)(r+\delta) = \overline{P}^H. \qquad \text{(B.21)}$$

Note that a housing tax regime equivalent to the uniform housing tax $\overline{t}^H$ could be implemented through a property tax reform of the kind considered in Box 7.2 where rental housing becomes subject to the property tax rate $\hat{\tau}$ and owner-occupied housing is taxed at the rate $\hat{\tau} + t^r r$, and where the rental property tax rate is chosen to satisfy the condition $\left(1+t^H\right)(r+\hat{\tau}+\delta) = \left(1+\overline{t}^H\right)(r+\delta) = \overline{P}^H$.

In a similar way, since we have already quantified the deadweight loss from non-uniform taxation of non-housing consumption in Chapter 5, we will assume that all non-housing consumer goods are uniformly taxed at the tax-exclusive rate $\overline{t}$ which ensures that the consumer price index for these goods remains equal to their pre-reform value $\overline{P}_o$:

Box 7.3 cont.

$$\overline{P}_o = 1 + \overline{t}\,. \tag{B.22}$$

We now consider a reform involving a switch to uniform taxation of housing and other goods at a common tax-exclusive rate t which keeps the overall consumer price index (and hence consumer welfare) constant. Given that such a reform does not erode the welfare of consumers, it will generate a social welfare gain in so far as it increases public revenue, so the revenue gain is a measure of the deadweight loss from non-uniform taxation of housing and other goods. Sørensen (2010, pp. 40-41) shows that when consumers behave in accordance with (B.20), the revenue gain from a move to uniform taxation of all goods and services, measured as a fraction of the value of total consumption, dR/PC, is given by

$$\frac{dR}{PC} = \overbrace{\sigma(1-\mu)(1-\omega_o)\left(\frac{\overline{P}_o}{P}\right)^{1-\sigma}\left[\left(\frac{\overline{t}^{\,H}}{1+\overline{t}^{\,H}}\right)-\left(\frac{\overline{t}}{1+\overline{t}}\right)\right]\left(\frac{\overline{t}^{\,H}-\overline{t}}{1+\overline{t}}\right)}^{\text{dynamic revenue gain from substitution towards the type of consumption which was most heavily taxed initially}} > 0, \tag{B.23}$$

$$0 < \omega_o \equiv \frac{1}{1+Z} < 1, \qquad Z \equiv (r+\delta)^{1-\sigma}\left(\frac{\mu}{1-\mu}\right)\left(\frac{1+\overline{t}}{1+\overline{t}^{\,H}}\right)^{\sigma}.$$

The positive sign of the revenue effect in (B.23) follows from the fact that μ and ω_o always take values between zero and unity. In the main text we offer an intuitive explanation for the gain from the move to uniform taxation. Sørensen (2010, p. 45) demonstrates how one may use (B.20) to estimate the preference parameter μ, given data on the budget share of housing consumption and an estimate of/assumption on the substitution elasticity σ. In the benchmark case considered in the text where this elasticity is one, we see from the first equation in (B.20) that μ is simply equal to the expenditure share of housing consumption in total consumption, $P_H C_H / PC$.

The reason why a move to uniform taxation of housing and other goods could increase economic efficiency is the same as the reason given in Chapter 5 for the potential gain from a move towards a uniform VAT on all non-housing goods. Taxes on consumption

drive a wedge between the consumer price reflecting the consumer's marginal benefit from the good and the producer price reflecting the marginal cost of producing the good. The tax wedge therefore measures the marginal social gain from an extra unit of consumption and production. If the initial tax wedge on housing services is lower than the tax wedge on other forms of consumption, a move to uniform taxation will trigger a decrease in the production and consumption of housing and an increase in the production and consumption of other goods. Since the marginal social gain from an increase in consumption and production is greater where the initial tax wedge is higher, this substitution from initially low-taxed housing consumption to initially high-taxed consumption of other goods generates a net gain in economic welfare.

In practice, a move to uniform taxation of housing and other goods that does not increase the overall consumer price level could be achieved through an increase in the property tax rate on owner-occupied housing combined with a decrease in the standard VAT rate. Using the relevant quantitative estimates reported above as well as those reported in Chapter 5, and assuming a substitution elasticity between housing and other consumption equal to one ($\sigma = 1$), we find by applying formula (B.23) in Box 7.3 that such a tax reform could generate an efficiency gain of about 0.3 percent of private consumption, equivalent to roughly 4.4 billion SEK measured in 2008 prices.

However, this estimate assumes that all excise taxes on items of non-housing consumption are ordinary distortionary taxes. Alternatively, one might assume that these taxes correct for the negative external effects (e.g. pollution) associated with certain forms of consumption, as we discussed in detail in Chapter 5. In that case where excise taxes improve economic efficiency rather than reduce it, our formula (B.23) implies that a move to uniform taxation of housing and other goods would leave economic efficiency roughly unaffected. The reason is that the increased consumption of non-housing goods would cause additional externalities (from increased pollution, smoking, drinking etc.) which would offset the efficiency gain from abolition of the tax subsidy to housing consumption.

Since excise taxes are levied partly to raise revenue, and partly to correct for externalities, the "true" efficiency gain from a move to uniform taxation of housing and other goods probably lies

somewhere between the two polar cases considered above, that is, somewhere in the interval between roughly zero and 0.3 percent of private consumption.

Distortions from capital gains taxation

In addition to the distortions discussed above, the tax system may generate distortions because of the fact that capital gains are taxed at the time of realization rather than at the time of accrual. As shown by Sørensen (2010, p. 69), if a nominal capital gain of one krona accrues to the taxpayer in the current year, and if he only realizes a fraction γ of his (remaining) gain each year, the effective tax rate on the accrued gain (τ^g) – defined as the present value of the current and future tax paid on realizations – is given by the formula

$$\tau^g = \overbrace{\left(\frac{\gamma}{\gamma + i^a}\right)}^{\text{benefit from tax deferral}} \cdot \tau^{sg}, \qquad (3)$$

where τ^{sg} is the statutory tax rate on realized capital gains, and i^a is the after-tax nominal interest rate used to discount future taxes paid. We see that the deferral of tax until the time of realization drives the effective tax rate on accrued capital gains below the statutory rate on realized gains. The parameter γ in (3) may be interpreted as the fraction of investors who realize (all of) their accrued gains in any given year. In that case the average holding period for the asset considered is given by $1/\gamma$. For example, if $\gamma = 0.1$, the average investor holds his asset for ten years before selling it. If the investor's nominal after-tax discount rate (i^a) is 0.05 and the statutory tax rate on realized gains is 30 percent, it then follows from (3) that the effective tax rate on accrued capital gains is only 20 percent. The longer the holding period (the lower the value of γ), the lower the effective tax rate on accrued capital gains.

The deferral of capital gains tax until the time of realization creates several distortions. First, by reducing the effective tax rate it may artificially stimulate the demand for assets whose returns mainly take the form of capital gains at the expense of the demand for, say, interest-bearing assets. Second, the lower effective tax rate

on capital gains relative to the tax rate on dividends may induce companies to retain their profits – in which case the return to shareholders takes the form of a capital gain on their shares – rather than paying them out as dividends. In this way the favourable taxation of capital gains may cause capital to be "locked" in existing companies even if it could have earned a higher social (pre-tax) return by being reallocated towards investment in other activities. Third, there is a more general "lock-in" effect when the capital gains tax is deferred until the time of realization, since this induces investors to hold on to their assets – thereby reducing the present value of their tax bill – even if they could have earned a higher pre-tax return on their savings by rearranging the composition of their portfolios. Fourth, if capital losses are only deductible when they are realized, investors can reduce their tax bill by immediately realizing a loss and buying back the asset immediately thereafter. This may generate a lot of transactions and associated transactions costs that would not occur in the absence of tax.

Furthermore, if realized losses were fully deductible, taxpayers would have almost unlimited possibilities of sheltering other income from tax, since an investor could purchase offsetting long and short posititions in assets and then realize the position with the loss to shelter other income while taking on no risk. For this reason all countries impose limitations on loss offsets. For example, in Sweden a realized loss on a share can only be fully deducted against realized gains on other shares. If the loss on a quoted share exceeds the realized gain on other shares, only 70 percent of the loss is deductible against the investor's capital income, up to a limit of 100,000 SEK. Above this cap, only 49 percent of the loss is deductible. For unquoted shares the deductible fraction of losses is even smaller. While such limitations on loss offsets are undoubtedly necessary to prevent extensive tax arbitrage, they clearly imply an asymmetry in the tax treatment of gains and losses. The limits on loss offsets tend to offset the tax benefits from the deferral of tax on gains, but it does so in a very imprecise way which may hamper investment in risky assets and discourage entrepreneurship.

As this discussion suggests, the efficiency loss from realizations-based capital gains taxation and limited loss offsets could be substantial, although it is very difficult to quantify. In

Section 7.3 we will discuss how the tax treatment of capital gains and losses could be made less distortionary.

7.2 The deadweight loss from non-neutral taxation of business investment in Sweden

While the previous main section focused on tax distortions to the pattern of household savings, the present section will highlight the most important distortions arising from the current non-neutral taxation of business investment. In part, these distortions take the form of the differential taxation of different forms of business organization and the tax discrimination in favour of debt finance. We will also discuss the distortions arising from non-neutral taxation of different types of business assets and the tax distortion to the overall level of business investment.

Alternative forms of business organization and the special character of widely held corporations

Based on differences in their economic characteristics and their tax treatment, we may distinguish between the following main forms of business organization in Sweden: 1) *Widely held public and private corporations* (noterade och onoterade aktiebolag), 2) *closely held corporations* (fåmansföretag), and 3) *sole proprietorships and partnerships* (enskilda näringsidkare och handelsbolag).

Swedish corporations are subject to a classical corporate tax regime: the taxable profits of the company are subject to the corporate income tax, and in so far as the shareholders are Swedish residents, they must pay personal income tax on their dividends and capital gains on the shares in the company. However, a key characteristic of widely held companies is that they will typically be able to raise funds in the international capital market, including the international market for shares. Even if a widely held company is not listed on the stock exchange, it may participate in the international market for private equity. As a consequence, the required return on a widely held company's debt and equity capital (the cost of finance) will be exogenously determined in the world capital market, regardless of the domestic personal tax rules. For example, if the domestic personal tax rate on dividends is raised,

inducing some domestic personal investors to sell off their shares in domestic companies, foreign investors stand ready to buy the shares at the going international market price since they are not affected by the higher domestic dividend tax.

The tax rules for closely held corporations

In contrast to widely held corporations, closely held companies will typically be relatively small firms that do not have access to the international stock market. These businesses must therefore obtain their equity finance from domestic investors subject to domestic personal taxes. Such an investor will be willing to invest equity in a domestic closely held firm as long as the risk-adjusted real return to equity before tax (r^e) implies an after-tax return which is at least as high as the real after-tax return obtainable on financial saving, that is, as long as

$$r^e\left(1-t^e\right)=r\left(1-t^r\right), \tag{4}$$

where t^e is the effective marginal personal tax rate on the return to shares, r is the real interest rate before tax (determined in the world capital market), and t^r is the marginal effective tax rate on real interest income.[39]

In the Swedish context, it is natural to define closely held corporations as companies whose owners are subject to the so-called 3:12 rules mentioned in Chapter 2. The 3:12 rules – determining the effective marginal personal tax rate t^e in equation (4) - apply to the holders of so-called qualified shares (kvalificerade andelar) in companies with few owners (fåmansföretag). As a main rule, a company is considered to have few owners if more than 50 percent of the voting shares in the company are controlled by at most four shareholders. To be

[39] Technical note: equation (4) is a simplification which assumes that the investor's only alternative to holding shares in the closely held company is to invest in interest-bearing assets and that these two asset types are perfect substitutes. A more realistic analysis would consider three investment alternatives such as shares in widely held companies, shares in closely held companies and interest-bearing assets, and it would allow for imperfect substitutability among assets. Such an analysis for a small open economy is carried out by Sørensen (2005) who finds that although the effects of domestic personal tax rates on shareholder income are more complex than equation (4) suggests, it is still true that the cost of equity finance for closely held companies is affected by personal taxes whereas the cost of equity finance for widely held companies is not.

deemed a qualified shareholder in a company with few owners, the shareholder must be active in the company to a significant degree so that his activity has a significant influence on the income generated by the company.

The purpose of the 3:12 rules is to prevent controlling shareholders in closely held companies from transforming heavily taxed labour income into lightly taxed capital income. When the holder of a qualified share receives a dividend from the company, the 3:12 rules require that the dividend be split into a capital income component and a labour income component. Dividends below so-called normal dividend (normalutdelning) are taxed as capital income, but at a reduced rate of 20 percent,[40] while dividends exceeding the 'normal' level are taxed as labour income. If the normal dividend exceeds the actual dividend, the difference – referred to as the Unutilized Distribution Potential (UDP)[41] – may be carried forward with interest and utilized in a later year.

The normal dividend is calculated as the sum of the following three components: 1) An imputed return on the purchase price of the share, 2) The sum of all UDP amounts from previous years, carried forward with interest, and 3) A Wage-Based Allowance (WBA) which varies positively with the company's wage bill. The rate of return imputed to the purchase price of the share (component 1) equals the average interest rate on long-term government bonds (statslåneräntan) plus a deemed risk premium of nine percentage points. The total WBA (component 3) equals 25 percent of the company's total wage bill plus 25 percent of that part of the wage bill which exceeds a certain limit.[42]

When a shareholder realizes a capital gain on a qualified share, the gain is taxed as capital income at a reduced rate of 20 percent in so far as it does not exceed the shareholder's accumulated UDP. Gains above this limit are taxed progressively as labour income. If a shareholder realizes a capital loss on a qualified share, he may deduct 2/3 of the loss against realized gains on other listed or unlisted shares. 70 percent of any remaining net loss may be deducted against other capital income. If capital income calculated

[40] Technically the reduction in the effective tax rate is implemented by including only 2/3 of the dividend in the capital income tax base subject to the ordinary 30 percent tax rate.
[41] In Swedish the UDP is sometimes referred to as "sparat utdelningsutrymme" or "sparat gränsbelopp".
[42] The complex rules for calculating the normal dividend are described in greater detail in Sørensen (2008, Chapter 3) who also illustrates their application by means of a numerical example.

in this way becomes negative, the taxpayer is entitled to a tax credit equal to the 30 percent capital income tax rate times the deficit recorded on his capital income tax account, provided the deficit does not exceed 100,000 kronor.

The special 3:12 rules described above imply that the effective tax rates t^e and t^r deviate from each other, so according to (4) the required pre-tax return on equity in closely held firms may deviate from the pre-tax interest rate r. Thus changes in the effective tax rate t^r on financial saving (e.g. a change in the personal tax rate on interest income) and changes in personal tax rates on dividends and capital gains will affect the cost of finance for closely held firms, and via this channel personal taxes will influence the user cost of capital for such firms. In contrast, the cost of equity finance for for widely held companies is simply equal to the pre-tax real interest rate r, possibly with the addition of an internationally determined risk premium.

The tax rules for proprietorships

The business income earned by sole proprietors is subject to social security tax and personal income tax. However, sole proprietors may opt to have income retained in the business taxed at the corporate income tax rate. They may also opt to have the income withdrawn from their business split into a capital income component and a labour income component. If a proprietor does not choose any of these options, all of his business income will be subject to social security tax, and all of the remaining amount will be taxed progressively as labour income.

The optional rule for allocation of retained business income to a so-called expansion fund (expansionsfond) is intended to ensure a neutral tax treatment of retained profits across incorporated and unincorporated firms. When a proprietor adds to the equity of his business by retaining profits, he may add a corresponding amount to the expansion fund in the firm's tax accounts. The addition to the expansion fund will then be taxed at the corporate tax rate and will be deductible from the amount of business income subject to social security tax and personal income tax. When the proprietor withdraws income from the expansion fund, the pre-tax amount withdrawn is added to his personal income tax base for that year,

and a credit equal to the preliminary tax already paid on that income is granted against his personal income tax bill.

The income withdrawn from the business in any given year equals that year's total business income minus that year's addition (positive or negative) to the expansion fund. Under the optional rules for so-called positive interest allocation (positiv räntefördelning), the income withdrawn from the business is split into capital income and labour income. The capital income component is calculated as an imputed return to an asset base defined as business assets minus the sum of business debt and the accumulated after-tax allocation to the expansion fund. By taking advantage of allocations to the expansion fund, the proprietor thus reduces the fraction of business income that may be taxed as capital income. The imputed rate of return equals the average interest rate on long-term government bonds (statslåneräntan) plus a deemed risk premium of 5 percentage points. The imputed return is taxed at the ordinary 30 percent capital income tax rate. Any withdrawn income exceeding the imputed return is subject to social security tax and the progressive personal tax on labour income.

If the income withdrawn from the business is smaller than the imputed return, the difference (the Unutilized Distribution Potential, UDP) is carried forward and added to the amount of income that may be taxed as capital income during the following year. Further, the UDP is added to the asset base for calculating the imputed return for the following year. In this way the UDP amounts are effectively carried forward with an interest rate equal to the imputed rate of return.

For administrative reasons, the rules for positive interest allocation may be applied only when the proprietor's net asset base exceeds 50,000 kronor.

While the rules for positive interest allocation are optional, the application of the rules for so-called negative interest allocation (negativ räntefördelning) are mandatory whenever the proprietor's recorded net business equity (business assets minus business liabilities) falls below minus 50,000 kronor. A negative asset base below this limit is taken to indicate that the proprietor has shifted non-business debt into the business sphere to exploit the fact that interest on business debt is deductible against taxable business income which may be subject to progressive taxation at the margin. In this case an imputed interest on the negative net equity base is added to taxable business income, and a corresponding amount is

deducted from the proprietor's 'private' capital income tax base. The imputed interest rate equals the interest rate on long-term government bonds plus 1 percentage point. In principle, negative interest allocation thus prevents the proprietor from transforming heavily taxed labour income into lightly taxed capital income.

When a proprietor realizes a capital gain on a business asset, the gain is in general taxed as ordinary business income. This rule also applies when the proprietor goes out of business by selling his firm or liquidating its assets. In this case any amounts accumulated in the firm's expansion fund are treated as income withdrawn from the business and taxed accordingly. If a proprietor realizes a capital loss at the time he goes out of business, he may deduct 70 percent of the loss against his taxable capital income.[43]

With a few exceptions relating to the calculation of taxable capital gains, the above tax rules for sole proprietors also apply to partnerships (handelsbolag).

Like closely held corporations, proprietorships can rarely tap the international market for equity capital, so their cost of equity finance will be given by an arbitrage condition like (4), but the effective personal tax rate on the return to equity (t^e) will differ between proprietorships and closely held companies because of the differential tax treatment of the two organizational forms. The next subsection will seek to quantify the resulting deadweight loss.

The deadweight loss from tax distortions to the choice of organizational form

If a particular form of business organization is favoured by the tax system, it will be profitable to undertake investment within this organizational form even if the marginal pre-tax return is lower than the marginal pre-tax return to investment within other organizational forms. As a consequence, it would be possible to increase overall national income by reallocating capital away from the tax-favoured organizational form towards businesses operating within another legal framework, but the profit-maximising behaviour of firms will prevent this reallocation as long as the tax rules discriminate between different organizational forms.

[43] These rules for the tax treatment of capital gains and losses on business assets apply in the general case. As described by Sørensen (2008, Chapter 3), there are special rules for gains and losses on real estate used for business purposes.

Box 7.4 presents a method for quantifying the resulting deadweight loss. Like previously, we measure the deadweight loss by the extra revenue the government would be able collect through a move to uniform taxation without reducing the welfare of the private sector. More precisely, the formulas (B.30) and (B.31) in Box 7.4 show that uniform taxation of the different organizational forms would allow the government to raise additional revenue without increasing the total cost of capital for the business sector.

To apply these formulas we need to estimate the differences in the investment tax wedges across organizational forms. The investment tax wedge (t^k) is the additional business income tax bill triggered by the "marginal" unit of investment which is just barely worth undertaking. When this tax wedge differs across organizational forms, the required pre-tax profit on the last unit of investment will also differ across the various types of business, and hence total pre-tax profits could be increased if investments were reallocated from low-taxed to high-taxed organizational forms. A business tax reform equalizing the investment tax wedge across organizational forms would induce such a reallocation which would raise aggregate pre-tax profits. As a consequence, the government would be able to collect additional business income tax revenue without reducing the total after-tax profits earned by private businesses. The formulas (B.30) and (B.31) in Box 7.4 measure this potential revenue gain which is a measure of the deadweight loss from the non-neutral tax treatment of different organizational forms.

Box 7.4 The deadweight loss from tax distortions to the choice of organizational form

A non-neutral taxation of widely and closely held firms will generate differences in the user cost of capital across these alternative forms of business organization. In this box we show that a switch to uniform taxation ensuring an identical cost of capital across organizational forms would allow the government to collect additional revenue without increasing the overall cost of business capital. As a consequence, aggregate investment and the average real wage would be unaffected, and hence consumer welfare would also remain unchanged. The deadweight loss from non-uniform taxation across organizational forms may

Box 7.4 cont.
thus be measured by the additional revenue that could be gained by equalizing the cost of capital for the two organizational forms at the level of the current aggregate cost of business capital.

Since the legal and institutional framework and/or the governance problems associated with the two types of organizational form are different (see, e.g., the discussion by Hagen and Sørensen (1998)), we may think of capital invested in the different types of business organization as being imperfect substitutes. Thus we specify the total stock of business capital as a CES-aggregate of capital invested in widely held firms (K_w) and capital invested in closely held firms (K_c, with a substitution elasticity σ_k between them:

$$K=\left[\varpi^{1/\sigma_k}K_w^{(\sigma_k-1)/\sigma_k}+(1-\varpi)^{1/\sigma_k}K_c^{(\sigma_k-1)/\sigma_k}\right]^{\frac{\sigma_k}{\sigma_k-1}},\qquad 0<\varpi<1. \quad \text{(B.24)}$$

The user costs associated with the aggregates K, K_c, and K_w (denoted by ρ, ρ_c, and ρ_w, respectively) are defined so as to satisfy

$$\rho K=\rho_w K_w+\rho_c K_c. \quad \text{(B.25)}$$

The disaggregation outlined above involves treating the representative firm as a conglomerate that spreads out its total capital stock across different organizational forms. To maximise profits, the conglomerate must minimise the total user cost ρK associated with the use of any given aggregate stock of capital, that is, it must allocate its capital across widely and closely held firms so as to minimise (B.25) subject to (B.24), where K is treated as fixed. Solving this problem yields:

$$K_w=\varpi\left(\frac{\rho_w}{\rho}\right)^{-\sigma_k}K,\qquad K_c=(1-\varpi)\left(\frac{\rho_c}{\rho}\right)^{-\sigma_k}K,\qquad \rho=\left[\varpi\rho_w^{1-\sigma_k}+(1-\varpi)\rho_c^{1-\sigma_k}\right]^{\frac{1}{1-\sigma_k}}. \quad \text{(B.26)}$$

The user costs associated with capital invested in the two forms of business organization are

$$\rho_w=r+\delta+t_w^k,\qquad \rho_c=r+\delta+t_c^k, \quad \text{(B.27)}$$

Box 7.4 cont.

where r is the real rate of return after business tax required by the international capital market, δ is the real (exponential) rate of economic depreciation of a unit of business capital, and t_w^k and t_c^k are the investment tax wedges on widely and closely held firms, respectively. Using (B.26) and (B.27), Sørensen (2010, p. 34) shows that a business tax reform which equalizes the user cost of capital across the two organizational forms while keeping the overall user cost ρ constant will have to satisfy

$$dt_c^k = -\left(\frac{\varpi}{1-\varpi}\right)\left(\frac{\rho_c}{\rho_w}\right)^{\sigma_k} dt_w^k. \qquad \text{(B.28)}$$

If the tax reform specified in (B.28) generates additional public revenue, the revenue gain represents a gain in economic efficiency, since the reform does not increase the cost of business capital for the private sector. The total revenue from business income taxes is $R_k \equiv t_w^k K_w + t_c^k K_c$, so the change in business income tax revenue generated by the reform is

$$dR_k = \overbrace{dt_w^k \cdot K_w + dt_c^k \cdot K_c}^{\text{static revenue effect}} + \overbrace{t_w^k \cdot \frac{dK_w}{d\rho_w} \cdot dt_w^k + t_c^k \cdot \frac{dK_c}{d\rho_c} \cdot dt_c^k}^{\text{dynamic revenue effect}}. \qquad \text{(B.29)}$$

From (B.28) it is easy to show that the static revenue effect in (B.29) is zero. Hence we see from (B.29) that the efficiency gain is equal to the dynamic revenue gain accruing as the tax reform induces substitution towards the organizational form which is more heavily taxed at the outset. Using (B.26), Sørensen (2010, p. 34) proves that the dynamic revenue gain from a "cost neutral" business tax reform satisfying (B.28) (measured relative to the total user cost of business capital) can be written as

$$\frac{dR^K}{\rho K} = \overbrace{\varpi\sigma_k \left(\frac{\rho}{\rho_w}\right)^{\sigma_k} \left(\frac{t_w^k}{\rho_w} - \frac{t_c^k}{\rho_c}\right) \frac{(\rho_w - \rho)}{\rho}}^{\text{dynamic revenue effect}} > 0. \qquad \text{(B.30)}$$

The positive sign of the expression on the right-hand side of (B.30) follows from the fact that the last two brackets will

Box 7.4 cont.
always have the same sign, that is, if $t_w^k / \rho_w > t_c^k / \rho_c$ we must have $\rho_w > \rho$, and vice versa, given the user cost specifications in (B.26) and (B.27). The intuitive explanation for the efficiency gain from a move to neutral taxation of the alternative organizational forms is given in the main text.

Following a similar procedure, Sørensen (op.cit.) finds that an equalization of the tax wedges on closely held incorporated and unincorporated firms at a level ensuring a constant value of ρ_c will generate the following dynamic revenue gain relative to gross pre-tax profits,

$$\frac{dR_c^K}{\rho_c K_c} = \chi \sigma_c \left(\frac{\rho_c}{\rho_{cc}} \right)^{\sigma_c} \left(\frac{t_{cc}^k}{\rho_{cc}} - \frac{t_{cp}^k}{\rho_{cp}} \right) \frac{(\rho_{cc} - \rho_c)}{\rho_c} > 0, \quad \text{(B.31)}$$

where ρ_{cc} and ρ_{cp} are the initial user costs of capital for closely held incorporated and unincorporated firms, respectively, t_{cc}^k and t_{cp}^k are the initial investment tax wedges on the two forms of organization, σ_c is the substitution elasticity between them, and χ is a parameter reflecting the strength of investor preference for the corporate organizational form.

Sørensen (2010, Appendix A) shows how one may estimate the investment tax wedges for the different forms of business organization, adapting the general methodology introduced by King and Fullerton (1984) to account for the special Swedish tax rules for closely held companies and proprietorships. In Table 7.2 the estimated Swedish investment tax wedges under 2010 tax rules are measured in percent of the user cost of capital, defined as the marginal real investment return before depreciation and tax. The estimated tax wedges are averages across investment in machinery and buildings (which have different rates of depreciation).

The estimates in Table 7.2 assume a real cost of finance (*r*) equal to five percent and an inflation rate of two percent. They also assume that depreciation for tax purposes corresponds to true economic depreciation (later on we shall consider the effects of accelerated depreciation). The weigthed averages reported in the bottom row and in the last column were calculated using estimates

of the relative economic weight of the various organizational forms and the alternative modes of investment finance.[44]

When evaluating the figures in Table 7.2, it is important to keep in mind that the investment tax wedge only measures the difference between the pre-tax return to business investment and the pre-tax interest rate (or the pre-tax return on shares) determined in the international capital market. For resident business owners, there is an additional tax bill in the form of the personal capital income tax they have to pay. However, as we explained in Chapter 4, this "savings tax wedge" (captured by the term $t^r r$ on the right-hand side of equation (4)) does not reduce the incentive to invest in Sweden, since the savings income tax must be paid regardless of whether the savings are invested at home or abroad. At the same time we recall from (4) that the personal taxes on the owners of closely held companies and proprietorships do affect the investment tax wedge via their influence on the required return to equity (r^e), in so far as the personal tax rules imply a difference between the effective tax rate on equity income (t^e) and the effective tax rate on interest income (t^r).

[44] The detailed assumptions underlying Table 7.2 are documented in Sørensen (2010, Appendix A and C). The estimated tax wedges for closely held corporations in Table 7.2 do not account for the Wage-Based Allowance described above, since the effect of the WBA depends crucially on whether labour is complementary to or substitutable for capital at the margin. In Section 7.5 we will describe the particular distortions arising from the WBA.

Table 7.2 Investment tax wedges in Sweden (2010 tax rules)

Form of business organization	*Investment tax wedge (percent of user cost)*			
	Finance by debt	Finance by new equity	Finance by retained profits	Weighted average across modes of finance[1]
Widely held corporations	-5.4	11.3	11.3	4.6
Closely held corporations	-27.4	14.1	13.3	-5.7
Proprietorships	-34.7	-6.6	-2.6	-15.8
Weigthed average across closely held corporations and proprietorships[2]	-28.4	-13.0	11.0	-7.1
Weighted average across all organizational forms[3]	-11.5	4.7	11.2	1.4

[1.] Weights: Debt: 0.4. New equity: 0.1. Retained profits: 0.5. These weights correspond to those assumed by Öberg (2003).

[2.] Weights: Closely held corporations: 0.858. Proprietorships: 0.142. The weights reflect an average of the relative magnitude of the total turnover and the total wage bill for each organizational form, based on data from the FRIDA database.

[3.] Weights: Widely held corporations: 0.727. Closely held corporations: 0.234. Proprietorships: 0.039. The weights reflect an average of the relative magnitude of the total turnover and the total wage bill for each organizational form, based on data from the FRIDA database.

Source: Own calculations based on the formulas derived in Sørensen (2010, Appendix A) and the parameter values reported in Sørensen (2010, p. 83).

The estimates in Table 7.2 are remarkable since they indicate that the marginal investments undertaken by closely held corporations and proprietorships are *subsidised* by the current system of business income taxation. The tax subsidy is particularly large for debt-financed investment where entrepreneurs can deduct the full nominal interest expense (including the inflation premium) against their marginal business income which gets taxed at the high marginal labour income tax rate. For investment financed by new equity there is also a substantial tax subsidy to closely held firms (proprietorships and closely held companies), because the imputed return to equity that is taxed as capital income includes a generous risk premium which effectively allows entrepreneurs to convert high-taxed labour income into low-taxed capital income at the margin (see Sørensen (2010, Appendix A). When investment is financed by retained profits, the investment tax wedge for closely held corporations becomes positive, because the marginal investment return is hit by the corporate income tax as well as the

personal tax on capital gains on shares. By contrast, proprietors only have to pay the low 26.3 percent corporate tax rate on their profits when earnings are retained, whereas they would have had to pay the ordinary 30 percent capital income tax rate on funds invested outside their firm, so the tax system effectively subsidizes a proprietor's investment financed by retained earnings, as indicated in Table 7.2.

For widely held corporations there is also a tax subsidy to debt-financed investment because of the deductibility of the inflation component of nominal interest payments. However, the tax subsidy is lower for widely than for closely held firms, since the nominal interest expense of a widely held company only gets deducted against the relatively low corporate income tax rate. In the case of equity finance, widely held corporations get no deduction for the cost of finance, so in this case the investment tax wedge becomes positive. Since the user cost of capital for widely held corporations is unaffected by domestic personal taxes, the investment tax wedge is the same whether investment is financed by new equity or by retained profits. In both cases the recorded investment tax wedge of 11.3 percent of the user cost corresponds to the 26.3 percent corporate income tax rate on the marginal return net of depreciation.

Formula (B.30) allows an estimation of the deadweight loss from the non-neutral tax treatment of widely and closely held firms, where the latter category includes closely held corporations and proprietorships, weighted by their relative economic importance (see note 2 in Table 7.2). To apply the formula, we need to assume a value for the elasticity of substitution between the organizational forms of widely and closely held firms (σ_k). A great deal of uncertainty attaches to this parameter. Fullerton and Henderson (1987) assume that the elasticity of substitution between corporate and non-corporate capital lies between 0.3 and 3.0. We assume a value for our parameter σ_k slightly below the mid point of this interval, namely $\sigma_k = 1.5$. Furthermore, Sørensen (2010, p. 46) shows how one may calibrate the value of the preference parameter ϖ in (B.30), using the data referred to in notes 2 and 3 to Table 7.2.

Given these parameter values, equation (B.30) implies that the deadweight loss from the non-neutral tax treatment of widely and closely held firms amounts to 0.54 percent of total business profits

before depreciation, interest and taxes (= the magnitude ρK in (B.30), corresponding to almost 3 billion SEK in 2008 prices.

Following a similar procedure, we may use formula (B.31) to estimate the efficiency loss from the differences in the tax treatment of closely held corporations and proprietorships, given an assumed value of the substitution elasticity σ_c between these two organizational forms. As discussed in detail by Hagen and Sørensen (1998), the similarities between closely held companies and proprietorships are usually greater than the similarities between widely and closely held firms. Hence we have chosen a somewhat higher value of the substitution elasticity σ_c than of σ_k, namely $\sigma_c = 2$. On this basis we find from (B.31) that the differential tax treatment of closely held corporations and proprietorships generates a deadweight loss of 0.45 percent of the total gross profits of all closely held firms, equivalent to about 0.7 billion SEK in 2008 prices. Note that this loss comes on top of the 3 billion loss from the different tax treatment of widely and closely held firms.

These estimated efficiency losses from the tax distortions to the choice of organizational form are relatively small compared to the findings of other studies. For example, Gordon and MacKie-Mason (1994, 1997) exploited U.S. data for the period 1959-1986 to study how the allocation of reported assets and income between corporate and noncorporate firms responded to the difference in the effective tax rate on the two types of firm. On this basis the authors estimated that the average efficiency loss from the tax distortion to the choice of organizational form amounted to 16 percent of total business tax revenue over the period considered. In Table 7.1 we saw that the corporate income tax generated a revenue of 83 billion SEK in 2008. If we take 16 percent of this number, we get an amount of 13.3 billion SEK, considerably larger than our 3.7 billion estimate of the deadweight loss from the non-neutral taxation of business organizations in Sweden.

The deadweight loss from the tax bias against equity finance

Table 7.2 highlighted the tax subsidy to debt finance implied by the deductibility of nominal interest payments from the business income tax base. Because of this subsidy it is profitable for firms to undertake debt-financed investment even if it yields a pre-tax

return significantly below the pre-tax return on equity-financed investment.

A few simple equations may help to clarify how a conventional corporate income tax with interest deductibility distorts investment incentives. Consider a widely held company with access to the international capital market and suppose the world real interest rate is *r* which is also the (risk-adjusted) real rate of return on equity required by international investors. An equity-financed business investment which is just barely worth undertaking must then yield a real pre-tax rate of return c^e satisfying the break-even condition

$$(1-\tau)c^e = r \quad \Leftrightarrow \quad c^e = \frac{r}{1-\tau}, \tag{5}$$

where τ is the corporate income tax rate. When (5) is met, the pre-tax return to investment is just sufficient to generate an after-tax return equal to the international cost of finance, *r*. If the investment is instead financed by debt, the deductibility of nominal interest payments means that an extra krona of investment will trigger a corporate tax reduction equal to $\tau(r+\pi)$, where π is the rate of inflation so that $r+\pi$ is the nominal interest rate. A debt-financed investment will therefore break even provided it yields a real pre-tax rate of return c^d satisfying

$$(1-\tau)c^d = r - \tau(r+\pi) \quad \Leftrightarrow \quad c^d = r - \left(\frac{\tau\pi}{1-\tau}\right). \tag{6}$$

The investment tax wedge is the difference between the pre-tax investment return and the international cost of finance. From (5) and (6) we thus have

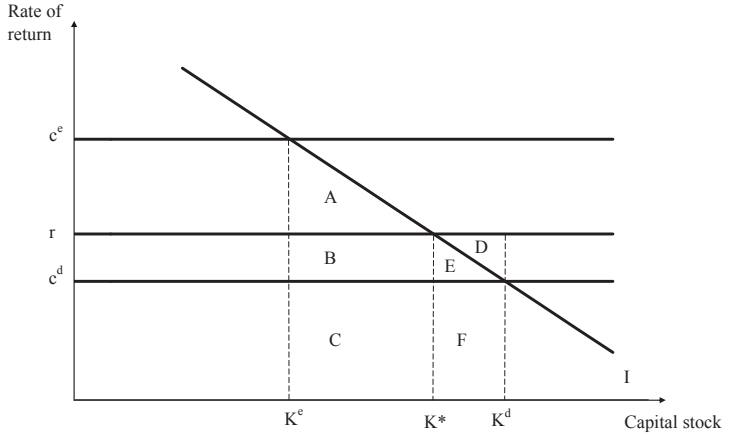
$$\begin{aligned} &\text{Investment tax wedge for equity-financed investment:} \quad c^e - r = \frac{\tau r}{1-\tau}. \\ &\text{Investment tax wedge for debt-financed investment:} \quad c^d - r = \frac{-\tau\pi}{1-\tau}. \end{aligned} \tag{7}$$

From the second line in (7) we see that the deductibility of interest does not only eliminate the corporate tax wedge; it even generates a negative tax wedge when the inflation rate π is positive. The reason is that the inflation component of the nominal interest rate is not a genuine business cost, since it is offset by a corresponding erosion of the company's real debt burden. Allowing deductibility for the inflation premium in the nominal interest rate therefore

implies a tax subsidy to debt-financed investment, whereas the non-deductibility of the cost of equity implies a tax penalty on equity-financed investment, as shown by the first line in (7).

The deadweight loss caused by the asymmetric tax treatment of debt and equity is illustrated in Figure 7.1. The curve labelled "*I*" shows how the marginal pre-tax rate of return to capital (capital's marginal product) declines as the domestic capital stock increases, because the more profitable investment opportunities become exhausted as the level of investment goes up. The horizontal curves show the international real interest rate and the required pre-tax returns on equity-financed and debt-financed investment given by (5) and (6), respectively. Because of the tax subsidy to debt finance, it pays for domestic firms to carry debt-financed to the level K^d where the marginal pre-tax return is c^d, below the international real interest rate. Since the I-curve indicates the rise in total output generated by each additional unit of capital, domestic output would fall by an amount equal to the area E+F if the volume of debt-financed investment were reduced by the amount $K^d - K^*$ in Figure 7.1. But if this freed-up capital $K^d - K^*$ were invested in the international capital market at the going world interest rate *r*, it would earn a total return equal to the area D+E+F, leaving a net gain in national income equal to the triangular area D. This area therefore measures the net social cost of the tax subsidy to debt finance.

Figure 7.1. The productivity loss from the asymmetric tax treatment of debt and equity



At the same time, if the volume of equity-financed investment could somehow be increased from the privately optimal level K^e to the higher level K^* in Figure 7.1, domestic output would rise by the area A+B+C. The social opportunity cost of this rise in investment would only be B+C, since this is the total income that could have been earned by investing the amount $K^* - K^e$ in the international capital market. Hence the area A measures the efficiency loss from the tax wedge $c^e - r$ on equity-financed investment.

It follows from this analysis that if the tax code allowed a deduction for the real international cost of finance *r* in the case of debt finance as well as equity finance, investment would be carried to the socially optimal level K^* regardless of the mode of finance. The efficiency loss from the non-neutral tax treatment of debt and equity finance is therefore given by the sum of the areas A and D in Figure 7.1. Box 7.5 presents a simple method of quantifying this efficiency loss.

Box 7.5 The productivity loss from the non-neutral tax treatment of debt and equity

When the *I*-curve reflecting the marginal productivity of capital can be approximated by the linear curve illustrated in Figure 7.1, the deadweight loss from the tax wedge $t_e^k \equiv c^e - r$ on equity-financed investment is approximately equal to the triangular area A. The investment tax wedge raises the user cost of capital (ρ) by a corresponding amount, that is, $d\rho = t_e^k$, where a "d" in front of a variable denotes a change in that variable. Hence we have the

Deadweight loss from the tax wedge on equity-financed investment (DWL^e):

$$DWL^e \approx \text{Area A} = \frac{1}{2}\cdot\overbrace{\left(c^e - r\right)}^{=t_e^k = d\rho}\cdot\overbrace{\left(K^* - K^e\right)}^{=-dK} = -\frac{1}{2}\cdot t_e^k \cdot \frac{dK}{d\rho}\cdot t_e^k = -\frac{1}{2}\cdot t_e^k K^e \cdot \frac{dK}{d\rho}\frac{\rho^e}{K^e}\cdot\frac{t_e^k}{\rho^e} \quad \Rightarrow$$

$$\frac{DWL^e}{t_e^k K^e} = \frac{1}{2}\cdot\frac{t_e^k}{\rho^e}\cdot\varepsilon_k, \qquad \varepsilon_k \equiv -\frac{dK}{d\rho}\frac{\rho}{K}. \tag{B.32}$$

Formula (B.32) measures the deadweight loss as a fraction of the revenue from the corporation tax levied on equity-financed

Box 7.5 cont.

investment, $t_e^k K^e$. The user cost ρ^e is the gross return to the marginal investment, defined as $\rho^e \equiv c^e + \delta$, where δ is the real rate of economic depreciation of the asset considered, and ε_k is the user cost elasticity of capital demand which we also encountered in Chapter 4. The fraction t_e^k / ρ^e in (B.32) corresponds to the figure in the second and the third column of the first row in Table 7.2.

In a similar way, the analysis in Figure 7.1 yields the

Deadweight loss from the tax subsidy to debt-financed investment (DWL^d):

$$\text{DWL}^d \approx \text{Area D} = \frac{1}{2} \cdot \overbrace{\left(r - c^d\right)}^{=-t_d^k=-d\rho} \cdot \overbrace{\left(K^d - K^*\right)}^{=dK} = -\frac{1}{2} \cdot t_d^k \cdot \frac{dK}{d\rho} \cdot t_d^k = -\frac{1}{2} \cdot t_d^k K^d \cdot \frac{dK}{d\rho} \frac{\rho^d}{K^d} \cdot \frac{t_d^k}{\rho^d} \quad \Rightarrow$$

$$\frac{\text{DWL}^d}{-t_d^k K^d} = \frac{1}{2} \cdot \left(\frac{-t_d^k}{\rho^d} \right) \cdot \varepsilon_k, \qquad \text{(B.33)}$$

where $-t_d^k K^d$ is the revenue loss from the tax subsidy to debt finance, and the fraction t_d^k / ρ^d corresponds to the number in the first column of the first row in Table 7.2.

If production takes place under constant returns to scale, as we assumed in Chapter 4, the marginal investment tax wedges will equal the average tax wedges. If a fraction β of the total capital stock K is debt-financed and the remaining fraction $1-\beta$ is equity-financed, the net corporate tax revenue collected from widely held firms (R^k) will then be

$$R^k = t_e^k K^e + t_d^k K^d = \left[(1-\beta) t_e^k + \beta t_d^k \right] K, \qquad 0 < \beta < 1. \qquad \text{(B.34)}$$

Using (B.32) through (B.34), we may now derive the total deadweight loss from the non-neutral taxation of debt and equity, expressed as a fraction of total corporate tax revenue:

$$\frac{DWL^e + DWL^d}{R^k} = \frac{\varepsilon_k}{2} \left[\frac{\left(t_e^k / \rho^e\right) t_e^k K^e + \left(t_d^k / \rho^d\right) t_d^k K^d}{t_e^k K^e + t_d^k K^d} \right] \quad \Rightarrow$$

$$\frac{DWL^e + DWL^d}{R^k} = \frac{\varepsilon_k}{2} \left[b \left(\frac{t_d^k}{\rho^d} \right) + (1-b) \left(\frac{t_e^k}{\rho^e} \right) \right], \qquad b \equiv \frac{\beta t_d^k}{\beta t_d^k + (1-\beta) t_e^k}. \qquad \text{(B.35)}$$

Box 7.5 focuses on widely held firms which account for about three fourths of all business activity in Sweden. To apply formula (B.35), we only need to combine the estimated tax wedges in the first row of Table 7.2 with assumptions on the user cost elasticity of capital demand (ε_k) and on the fraction of investment which is debt-financed (β). In Chapter 4 we argued that a plausible benchmark value for the former parameter is $\varepsilon_k = 1$, and in Table 7.2 we assumed that $\beta = 0.4$, in line with previous Swedish studies. With these assumptions it follows from formula (B.35) that the deadweight loss from the non-uniform tax treatment of debt and equity amounts to about 8.7 percent of the net corporate taxes paid by widely held corporations. Assuming that this number is representative for the entire corporate sector, and noting from Table 7.1 that the total corporate tax revenue in 2008 was 83 billion kronor, the absolute efficiency loss from the tax bias against equity finance can be estimated to roughly 7.2 billion SEK. This loss reflects that a move towards uniform taxation of debt and equity would induce a reallocation from debt-financed investment with a relatively low pre-tax rate of return towards equity-financed investment with a relatively high rate of return before tax.

The analysis in Figure 7.1 and Box 7.5 highlights the loss of productivity arising when high-taxed equity-financed investments coexist with low-taxed debt-financed investments, but it does not really explain why firms do not simply finance all of their investment with the cheapest source of funding, i.e., debt. Presumably the reason is that a very high leverage ratio would involve non-tax costs that would outweigh the tax benefits from debt finance. In particular, a high leverage ratio could force a firm into financial distress and ultimately bankruptcy and require managers to focus excessively on maintaining a steady cash inflow at the expense of other important management activities. This line of reasoning suggests that a part of the efficiency cost of the tax bias against equity finance is that firms are induced to increase their gearing ratio, thereby incurring greater costs of cash management and financial distress than they would have experienced under a neutral tax treatment of debt and equity.

Box 7.6 formalizes this idea by assuming that a firm's costs of financial distress and/or the risk premium included in its cost of finance increases when its debt-to-asset ratio exceeds some critical level. The box develops a formula showing how the tax bias against equity finance increases the total cost of finance for firms. This

cost increase is another part of the total deadweight loss from the non-neutral tax treatment of debt versus equity.

Box 7.6 The costs of financial distress and the tax bias against equity finance

Let β denote the representative firm's debt-to-asset ratio, and let *c* be its cost of financial distress per unit of capital. Suppose that, in the absence of tax, there is some optimal debt-asset ratio $\bar{\beta}$ which trades off the costs and benefits of debt versus equity in the best possible manner. The further the actual debt-asset ratio moves away from this optimal level, the greater is the cost of financial distress that it incurs. We may capture this idea by assuming that

$$c = \frac{\left(\beta - \bar{\beta}\right)^{1+1/\varepsilon}}{1+1/\varepsilon}, \qquad \varepsilon > 0. \tag{B.36}$$

If τ is the business income tax rate (e.g., the corporate income tax rate), *r* is the real rate of return required by international investors, and π is the rate of inflation, the firm's total real cost of finance per unit of capital ($\hat{r}$) is:

$$\hat{r} = (1-\beta)(r+\pi) + \beta(1-\tau)(r+\pi) + (1-\tau)c - \pi. \tag{B.37}$$

Equation (B.37) reflects the fact that the nominal cost of debt finance is deductible from the tax base whereas the cost of equity finance is not. It also assumes that the costs of financial distress are deductible. If we insert (B.36) into (B.37) and assume that the firm chooses its debt-asset ratio so as to minimize its total real cost of finance, we find that the privately optimal debt-asset ratio in the presence of tax is

$$\beta = \bar{\beta} + \left[\frac{\tau(r+\pi)}{1-\tau}\right]^{\varepsilon}. \tag{B.38}$$

The tax bias against equity finance thus induces the firm to choose a higher debt-ratio than the level $\bar{\beta}$ that would have been optimal in the absence of tax. Substituting (B.38) into (B.36), we get the cost of financial distress implied by the firm's cost-minimising behaviour:

Box 7.6 cont.

$$c = \left(\frac{\varepsilon}{1+\varepsilon} \right) \left[\frac{\tau(r+\pi)}{1-\tau} \right]^{1+\varepsilon}. \quad \text{(B.39)}$$

De Mooij and Ederveen (2008) survey a number of empirical studies suggesting that, on average, the increase in the representative firm's debt ratio induced by a one percentage point increase in the corporate income tax rate is about 0.3. If the corporate tax rate is, say, 33 percent, we would thus have $\beta - \overline{\beta} \approx 0.1$, assuming that the relationship between the tax rate and the debt ratio is roughly linear. This observed empirical link between the corporate tax rate and the debt ratio can be used along with (B.38) to calibrate the value of our parameter ε. From (B.39) we may then quantify the additional financial distress caused by the tax bias against equity finance.

If the tax code allowed a fraction α^e of the cost of equity finance to be deducted from the business income tax base, equation (B.37) would modify to

$$\hat{r} = (1-\beta)(1-\alpha^e\tau)(r+\pi) + \beta(1-\tau)(r+\pi) + (1-\tau)c - \pi. \quad \text{(B.40)}$$

From (B.36) and (B.40) one can show that equation (B.39) would then change to

$$c = \left(\frac{\varepsilon}{1+\varepsilon} \right) \left[\frac{\tau(1-\alpha^e)(r+\pi)}{1-\tau} \right]^{1+\varepsilon}. \quad \text{(B.41)}$$

If the tax code allowed a full deduction for an imputed rate of return $r+\pi$ on equity, we would have $\alpha^e = 1$. According to (B.41) there would then be no tax-induced costs of financial distress. The so-called Allowance for Corporate Equity discussed in Section 7.4 achieves such an outcome by equalizing the tax treatment of debt and equity.

According to the survey by De Mooij and Ederveen (2008), empirical studies of the impact of interest deductibility on corporate debt finance suggest that the corporation tax will increase the debt-to-asset ratio of the corporate sector by about 8 percentage points in a country like Sweden with a corporate income tax rate of 26.3 percent. Using this information along with the formulas (B.38) and (B.39), and assuming a real interest rate of 5 percent and an inflation rate of 2 percent, the analysis in Box 7.6 implies that the tax bias in favour of debt finance increases the cost of financial distress per unit of capital by 0.56 percentage points (56 basis points). This is almost 4 percent of the weighted average user cost of business capital implied by the assumptions underlying Table 7.2. If firms operate under constant returns to scale, the average gross return to capital equals the user cost associated with the marginal unit of capital. In that case our estimate implies that the tax system increases the aggregate costs of financial distress by about 4 percent of total business profits before depreciation, interest and taxes, equivalent to about 21.4 billion SEK in 2008 prices. This is a huge distortion which comes on top of the estimated 7.2 billion loss from the reduction in capital productivity caused by the tax discrimination against equity finance. Our estimate of the tax-induced costs of financial distress is of course rather uncertain and may seem quite high. However, if these costs are interpreted broadly to include the additional risk premia required by the suppliers of corporate finance as well as the costs of bankruptcies, our suggestion that the tax system may add about 50 basis points to the cost of corporate finance does not appear altogether unrealistic.

Tax distortions to the choice among asset types

For administrative reasons the business tax code typically applies the same rate of depreciation to a broad range of business assets. For example, Swedish tax law allows most types of machinery and equipment to be written down at a common rate of 30 percent on a declining balance basis, despite the fact that the true rates of economic depreciation differ across assets. As a consequence, the rate of depreciation for tax purposes will be "too high" for relatively long-lived assets and "too low" for short-lived assets.

When depreciation for tax purposes deviates from the true economic depreciation, Sørensen (2010, pp. 49-50) shows that the formulas (5) and (6) for the cost of capital (the required real pre-tax rate of return) for a widely held corporation modify to

$$\text{Cost of capital under equity finance:} \quad c^e = \frac{r(1-\tau a)}{1-\tau}$$

$$\text{Cost of capital under debt finance:} \quad c^d = r - \left(\frac{\tau(\pi + ra)}{1-\tau} \right) \tag{8}$$

The variable a measures the difference between the present value of the deductions for depreciation taken in the tax accounts and the present value of the true economic depreciation allowances. When the real rate of true depreciation is δ and the tax code allows the asset to be depreciated at the rate $\hat{\delta}$ on a declining balance basis (without indexation for inflation), Sørensen (2010, pp. 63-64) shows that

$$a = \frac{r\left(\hat{\delta} - \delta\right) - \pi\delta}{r\left(\hat{\delta} + r + \pi\right)}, \tag{9}$$

where we recall that r is the real interest rate and π is the rate of inflation. The negative term $-\pi\delta$ in the numerator of (9) reflects that when assets are written down on a historical cost basis in the tax accounts, inflation will gradually erode the real value of depreciation allowances, thus reducing their real present value. If the tax code allows accelerated depreciation to a sufficient degree (i.e., if $\hat{\delta}$ exceeds δ by a sufficient amount), the numerator in (9) will be positive. Since a will then also be positive, it follows from (8) that the depreciation rules will reduce the cost of capital. This situation will prevail when firms invest in long-lived assets with a relatively low rate of true depreciation (δ). On the other hand, for investment in short-lived assets with a high value of δ, the numerator in (9) may be negative in which case the depreciation rules will increase the cost of capital.

When the tax code applies the same rate of depreciation to a broad range of assets, it will thus artificially encourage investment in long-lived assets at the expense of investment in assets with a

short life. In other words, because investment in long-lived assets gives rise to overly generous deductions for depreciation whereas investment in short-lived assets triggers insufficient depreciation allowances, it will be profitable for firms to invest in the former type of assets even if they generate a lower pre-tax return than the latter type of assets. Hence national income could be raised by shifting investment from long-lived to short-lived assets, but the depreciation rules prevent such a productivity-enhancing reallocation of capital.

Using data for the United States, Hulten (2008) has estimated true economic depreciation rates for a wide range of assets. These estimates suggest that for most business assets in Sweden, the depreciation rates allowed by the tax code exceed the true economic depreciation, so in most cases the value of our variable a in (9) will be positive. Thus the Swedish capital allowances tend to subsidise most forms of business investment, thereby partly offsetting the tax wedge on equity-financed investment and reinforcing the tax subsidy to debt-financed investment already implied by the full deductibility of nominal interest payments. For the realistic parameter values reported in Sørensen (2010, Appendix C), the average investment tax wedge across the different types of business investment in Sweden appears to be close to zero, so on average the Swedish system of business income taxation does not seem to discourage or encourage investment to any significant degree. However, as we have seen in this main section, the investment tax wedges differ across organizational forms, modes of finance and asset types, resulting in a substantial misallocation of capital across different uses. Even abstracting from the tax distortions to the choice among asset types, we estimated the total deadweight loss from the system of business income taxation to be more than 32 billion SEK in 2008 prices, corresponding to almost 40 percent of corporate tax revenue in 2008. The bulk of this deadweight loss was estimated to arise from the non-neutral tax treatment of debt and equity finance.

In Section 7.4 we will propose a business tax reform intended to eliminate all of the distortions to the pattern of business activity identified above.

7.3 Options for reforming the taxation of savings income in Sweden

In Section 7.1 we highlighted the main distortions arising from the non-neutral taxation of savings income in Sweden. The present section will discuss how the taxation of savings income could be reformed to reduce or even eliminate these distortions.

Addressing tax distortions to portfolio composition

Under current Swedish tax law, the (imputed) return to "institutional" financial savings via pension funds and life insurance companies is only taxed at roughly half the 30 percent rate of tax on the return to "free" financial savings invested directly by households themselves. Further, since contributions to pension savings schemes are deductible while pensions are taxable, the effective tax rate on the return to pension savings will be reduced to the extent that the marginal income tax rate at the time of contribution is higher than the marginal tax rate at the time pensions are received. Finally, in Sweden the contributions to pension schemes mandated by collective bargaining agreements (tjänstepensioner) are exempt from ordinary social security tax and are instead subject to the lower so-called special wage income tax (särskild löneskatt). This feature of the tax law further lowers the effective tax rate on pension savings for high-income earners for whom the social security contribution works like an ordinary tax.

The analysis in Section 7.1 showed that if the marginal effective tax rate on institutional and free financial saving were equalized, the government would be able to increase its total revenue without reducing the average after-tax return to financial saving, and hence without reducing the welfare of savers. The potential revenue gain from a move to uniform taxation of all returns to saving was estimated to be about 3½ billion SEK in 2008 prices, albeit with a considerable margin of uncertainty.

Sweden does not stand out as the only country offering tax favours to private retirement saving. Indeed, practically all OECD countries grant such favours in one way or another, although to different degrees. The international tax policy debate has featured three main arguments for tax concessions to private retirement saving. First, it is argued that since some individuals are myopic or

lack the necessary self-control to postpone consumption, they must be induced to save for retirement through tax subsidies to this form of saving. Essentially this argument claims that people do not always know (or are not always able to act in recognition of) what is good for themselves. Second, it is argued that some people may deliberately and strategically save too little for retirement in the expectation that the government will "bail them out" by supporting them in old age rather than leaving them to "starve". To the extent that the government actually feels obliged to engage in such bail-out behaviour, it could save money if these strategic non-savers could be induced to save. Third, it is sometimes argued that the overall savings level tends to be too small and that private savings should therefore be encouraged.

On reflection, all of these arguments provide a very weak case for tax subsidies to retirement saving. Indeed, the first two arguments could justify that the government imposes certain mandatory minimum requirements for private retirement saving, but they only imply a case for subsidizing such saving if mandatory savings requirements are seen as an unacceptable government intervention in the private decisions of those who are not myopic or who do not act strategically. Moreover, if people are in fact myopic or expect that the government will always bail them out if they are in need of cash, they will not only tend to save too little for retirement but will also set aside too little "precautionary" saving for "a rainy day". Hence myopia and strategic behaviour would not only seem to call for subsidies to retirement saving, but also to other forms of savings if the government is unwilling to impose minimum savings requirements. Pursuing such a policy could obviously end up costing the government a lot of revenue.

Furthermore, even if it is granted that total national saving is too small – which is far from obvious – it is hard to see how this could justify subsidies to retirement savings rather than subsidies to (or reduced tax rates on) all forms of saving. As noted by Bergström, Palme and Persson (2010), the empirical evidence suggests that tax subsidies to retirement savings mainly induce taxpayers to increase their retirement savings at the expense of other forms of saving rather than increasing the total amount of saving.

Bergström, Palme and Persson (op.cit.) find that the main tax subsidy to retirement saving in Sweden stems from the reduced tax rate on the (imputed) rate of return. Against this background, and

because the arguments for this kind of tax subsidy appear so weak, Swedish policy makers should seriously consider aligning the tax rate on the imputed return to institutional saving (avkastnings-skatten) with the ordinary personal capital income tax rate on the return to free financial saving. As already mentioned, this would improve economic efficiency by eliminating the most important tax distortion to portfolio composition.

The analysis in Chapter 4 indicated that the marginal deadweight loss from the overall taxation of savings income in Sweden is relatively high. If the tax rate on the return to institutional saving is aligned with the ordinary capital income tax rate, the latter rate should therefore be reduced. The ordinary capital income tax rate is currently 30 percent. However, dividends on shares in unlisted companies are taxed at a reduced rate of 25 percent, and the tax rate on dividends from closely held corporations (fåmansföretag) is only 20 percent, while the tax rate on the imputed return to institutional saving is 15 percent. A tax reform aimed at eliminating tax distortions to portfolio composition could align all of these tax rates at a common level of, say, 25 percent. In the light of the growing international mobility of corporate capital, and to mimimise opportunities for tax arbitrage, it would be natural if such a reform were accompanied by a reduction of the corporate income tax rate from the current level of 26.3 percent to 25 percent.

Based on the average revenue from the ordinary personal capital income tax in 2007 (a boom year) and 2008 (a recession year), a cut in the tax rate from 30 percent to 25 percent would cause a "static" revenue loss (disregarding responses in taxpayer behaviour) of roughly 6.3 billion SEK.[45] At the same time the static revenue gain from increasing the tax rate on the imputed return to institutional saving (the "avkastningsskatt") from 15 to 25 percent would be about 9.3 billion SEK, judging from the average revenue in 2007-2008.[46] Thus the reform would leave a static net revenue gain of about 3 billion SEK. As the analysis in Box 7.1 made clear, the behavioural taxpayer responses to the change in tax rates can be expected to generate a further dynamic revenue gain. The total

[45] This figure is calculated in a simple way as (5/30) times the average revenue from the ordinary personal capital income tax across 2007 and 2008.
[46] This number is calculated as (10/15) times the average revenue from the "avkastnings-skatt" across 2007 and 2008.

revenue gain could help to finance the reform of business income taxation proposed in Section 7.4.

Presumptive taxation of capital income: a blueprint for tax reform?

In Sweden the tax on retirement saving is levied on a relatively low imputed return[47] rather than on the actual return to the assets held by pension funds and life insurance companies, as we have seen. In other words, the tax is imposed on a presumed return to institutional saving. Feldt (2009) and Lodin (2009a) have recently proposed that this method of presumptive capital income taxation be extended to a broader range of assets. According to the proposal by Lodin (op.cit.), most of the existing Swedish personal capital income tax would be replaced by a presumptive tax calculated according to the following principles:

$$\text{Presumptive capital income tax} = t \cdot i \cdot (A - D),$$

$t =$ capital income tax rate

$i =$ imputed rate of return

$A =$ market value of financial assets except unlisted shares and listed shares in excess of 10% of the total shares in the company

$D =$ debt in excess of the value of shares not included in A

Under Lodin's proposal, the value of assets would be calculated as the average of the market value at the beginning and the end of the year, and the imputed return would be set at 3%, corresponding roughly to the average return on risk-free (or low-risk) assets in recent years. For unlisted shares and large shareholdings in listed companies, the tax bill would still depend on the actual return calculated in accordance with current tax rules.

The system of presumptive capital income taxation proposed by Feldt and Lodin is heavily inspired by the so-called box system of capital income taxation in the Netherlands, introduced by the Dutch tax reform of 2001 (see Bovenberg and Cnossen, 2003). Essentially the system is also identical to the so-called Risk-Free

[47] The imputed rate of return is the average interest rate on Swedish government bonds with a term to maturity of at least 5 years (statslåneräntan).

Return Method (RFRM) of capital income taxation, discussed by the McLeod Committee (2001) established by the New Zealand government and further analyzed by Burman and White (2003). Under the RFRM the capital income tax base is calculated as an imputed risk-free rate of return on the value of the taxpayer's net assets. The economic rationale for the RFRM is that the risk premium an investor expects to earn on an asset just compensates for the extra risk he/she incurs, so taxing a presumptive risk-free return (regardless of the actual return) is equivalent ex ante to taxing the *expected* rate of return.

The main advantage of the RFRM is that it avoids the lock-in effects caused by realizations-based capital gains taxation, since the taxpayer's tax liability is independent of any actual gain or loss made. In particular, Lodin (2009a) stresses that as Swedish taxpayers have increased their investments in mutual funds (fondsparande) over the years, the capital gains tax triggered by a reallocation of savings from one fund to another or by a reallocation away from mutual funds may increasingly distort the composition of household portfolios. A switch to the RFRM would eliminate this problem because the asset base to which the taxable return is imputed is not affected by a pure reallocation from one asset to another.

On the other hand, the RFRM has the disadvantage that the presumptive taxable return will generally deviate from the actual return, especially in years with large capital gains or losses. This may be seen as unfair. For example, in a year of financial crisis with large drops in asset prices, investors will pay a positive capital income tax even if they have suffered big capital losses. This feature of the RFRM also means that all of the investment risk is shifted onto taxpayers. By contrast, taxation based on the actual return means that part of the risk is shifted to the government which may be in a better position to bear it, since it can pool risk across all current taxpayers and even across generations by managing the public debt.

An alternative approach to capital gains tax reform

A consistent capital income tax would tax all accrued capital gains (and allow a deduction for all accrued capital losses) no matter whether they have been realized or not. Like the RFRM, such a

system avoids the lock-in effect associated with realization-based capital gains taxation. One traditional objection to accruals-based taxation is that the market value of assets that have not been traded in the market place during the fiscal year may be difficult to assess, so accrued but unrealized capital gains may be difficult to measure. Another conventional objection is that taxation of unrealized gains may cause a liquidity problem for taxpayers who do not have the cash to pay the tax bill.

However, the same problems arise under the RFRM, since this method requires a valuation of unrealized assets for the purpose of calculating the imputed return, and since the RFRM implies a positive tax bill even if the taxpayer's asset does not generate a positive cash flow. In addition, the separation of the tax bill from the actual investment return under the RFRM may be seen as unfair and may involve an inefficient allocation of risk, as noted above.

Against this background, it seems preferable to eliminate the distortions from tax deferral and lock-in effects under a realizations-based capital gains tax by moving towards accruals-based taxation rather than switching to the RFRM. Indeed, taxation of accrued capital gains on listed shares (including shares held through mutual funds) should not cause any serious valuation or liquidity problems, since the market prices of such shares are quoted on a daily basis, and since the existence of a liquid market means that the taxpayer will normally be able to raise the cash needed to pay his tax bill, either by borrowing against his accrued capital gain, or by realizing a fraction of his shareholding. Indeed, the advances in information technology and the liberalization and development of capital markets in recent decades have undermined the traditional arguments against accruals-based taxation of capital gains on listed shares, the recent financial crisis not-withstanding. A move to an accruals-based tax treatment of capital gains and losses on listed shares would also strengthen the automatic fiscal stabilizers that tend to dampen business fluctuations, since a downturn of the stock market during a recession would immediately trigger tax deductions (or, if necessary, tax credits) for all capital losses on shares, including unrealized losses, and the capital gains typically arising during a boom would be subject to immediate taxation even if they are not realized.

For unlisted shares for which no current market price is recorded, the problem of assessing the magnitude of unrealized

gains and losses remains. However, ceteris paribus, a retention of profit in a company normally generates a corresponding increase in the value of its shares, and a reported negative profit usually causes a similar drop in the stock price. Retained profits and business losses are recorded in (or may be calculated from) the company's tax accounts, and this information could be used to eliminate much of the distortion from the deferral of capital gains tax and the deferral of loss offsets under the current capital gains tax regime. Specifically, the basis value of shares in an unlisted company could be written up each year by the retained taxable profit reported by the company, and shareholders could be subjected to capital gains tax on the corresponding amount. If a shareholder sells a share at a price exceeding its written-up basis value, he should be subject to further capital gains tax on the excess amount. Symmetrically, if the company reports a loss, the value of its shares should be written down correspondingly, and shareholders should be granted an immediate deduction (if necessary, a tax credit) for the recorded loss on their shares.

Such a capital gains tax regime for unlisted shares would have several advantages. First, there would be no valuation problems, since the capital gains tax liability is based on the company's retained taxable profits, or on the recorded sales price when shares are sold. Second, there would be no liquidity problem since tax would be liable only if the company earns a positive taxable profit, and since the company can be required to pay the flat capital gains tax on behalf of individual resident shareholders. Third, the taxation of realized gains in excess of the stepped-up basis value of shares would ensure taxation of (realized) gains stemming from higher expected future company earnings, and the immediate write-down of basis values and the concomitant loss offsets to shareholders in years with negative company profits would imply a high degree of symmetry and neutrality in taxation. In particular, the system would be neutral towards decisions on dividend payouts, since the shareholders' tax bill would be the same whether a given amount of profit is paid out or retained.[48]

The practice of stepping up the basis value of shares by the amount of retained after-tax profits was used as a way of avoiding

[48] The capital gains tax rules should be seen in conjunction with the tax rules for business income. In closely held unlisted companies, retained profits should only trigger personal capital gains tax in so far as the retained earnings do not exceed an imputed return on the company's net equity. In Section 7.4 we shall explain that this limitation is necessary to ensure an equal tax treatment of closely held companies and proprietorships.

double taxation of retained earnings in Norway from 1992 through 2005. The step-up of basis was applied to all shares in Norwegian companies held by individual as well as corporate shareholders. Under the capital gains tax regime proposed here for Sweden it would only be necessary to allocate retained earnings to the basis value of shares in unlisted Swedish companies held by resident individual shareholders. However, for shares in unlisted foreign companies the capital gains tax rules suggested above would be difficult to implement, since foreign tax authorities could not be relied on to provide the necessary information on retained profits. For such shares we suggest to use the Risk-Free Return Method.

Towards neutral taxation of residential property[49]

The RFRM may also provide a blueprint for reform of the taxation of residential property in Sweden. In Chapter 3 we noted that the central government tax on immovable property was completely abolished from 2008 and replaced by a very low municipal property tax equal to the minimum of 6000 SEK and 0.75 percent of the assessed property value. As a consequence, even when one accounts for capital gains taxes and stamp duties, the return to investment in owner-occupied housing is now taxed at a very low effective rate, giving rise to a considerable deadweight loss, as we explained in Section 7.1.

To limit lock-in effects from the taxation of realized capital gains on owner-occupied housing, taxpayers are currently allowed to defer their capital gains tax bill in so far as they reinvest their gain in a new residential property, but they are obliged to include an imputed interest rate of 1.67 percent of the deferred capital gain in their annual taxable capital income. As noted by Lodin (2009a), this system of tax deferral gives rise to administrative problems, and about 90 percent of all taxpayer declarations of capital gains on residential property include errors.

Given these problems, it seems advisable to scrap the current municipal property tax and the current capital gains tax regime for residential property in favour of a property tax regime based on the Risk-Free Return Method. Despite the weaknesses noted above, the RFRM is probably the least imperfect system for taxing the return to owner-occupied housing, since accruals-based capital

[49] Parts of this section draw heavily on Sørensen and Johnson (2010, section 8.2.3).

gains taxation is difficult to implement for this type of asset. In particular, the heterogeneous nature of housing assets makes it hard to accurately measure the annual changes in the market value of a residential property that has not been traded during the year. Moreover, as noted by Burman and White (2003, p. 373), the fluctuations in house prices tend to overstate the riskiness of a housing investment because the purchase of a home combines both an investment and a consumption aspect. When house prices decrease, the user cost of housing consumption also decreases. In this sense the housing investment provides a hedge against volatility in housing prices, making it reasonable to exempt the risk premium from tax, as done under the RFRM.

Under the RFRM a risk-free imputed rent on owner-occupied housing would be included in the capital income tax base. Let us consider the magnitude of the taxable imputed rent that would ensure a neutral tax treatment of housing investment (and consumption) and other forms of investment (and consumption). In a hypothetical situation without taxation, a market equilibrium is established when the expected risk-adjusted return to investment in owner-occupied housing equals the market interest rate so that the following equilibrium condition is met:

$$i = \overbrace{h - \delta + g - p}^{\text{expected risk-adjusted nominal return to housing investment}} \quad . \tag{10}$$

The variable i in (10) is the risk-free nominal market interest rate (the government bond rate), p is the risk premium required on housing investment, h is the value of the housing service, δ is the expenditure needed to maintain the house, and g is the expected rate of nominal capital gain on the house. The variables h, δ, g and p are all measured as fractions of the current market price of the house. The right-hand side of (10) measures the total expected risk-adjusted nominal rate of return on the housing investment. If this return is higher (lower) than the market interest rate, housing prices will be bid up (driven down) until equation (10) is satisfied.

Under an ideal dual income tax the flat capital income tax rate t is applied to interest income as well as to an imputed rent calculated as a presumptive rate of return r on the current market value of the house, and interest expenses are deductible. The

housing market equilibrium condition under a dual income tax therefore changes from (10) to

$$i(1-t) = h - \delta + g - p - tr, \tag{11}$$

where the left-hand side is the nominal after-tax interest rate, and the right-hand side is the expected nominal risk-adjusted after-tax return on the housing investment. From (10) and (11) it is easy to see that if $r = i$, that is, if the imputed rate of return is set equal to the risk-free nominal interest rate, both equations will be satisfied simultaneously. In other words, with an imputed return $r = i$ the tax system would not distort the decision to invest in owner-occupied housing, since it would reduce the expected returns to housing investments and financial investments by identical amounts.

A tax on an imputed rent that is calculated as a risk-free interest rate times the current market value of the property is therefore an application of the Risk-Free Return Method. Note that when $r = i$, it follows from (11) that the home-owner's tax liability is

$$t \cdot r = t \cdot (h - \delta + g - p). \tag{12}$$

From the right-hand side of (12) one sees that the RFRM method implies taxation of the *expected* capital gain g rather than the actual gain experienced by the home-owner. We prefer the RFRM method as an alternative to taxing the actual capital gain. The reason is that accruals-based capital gains taxation is difficult to implement for housing, and that realizations-based taxation could generate serious lock-in effects on the housing and labour markets unless it is combined with something like the current system of tax deferral which has turned out to be difficult to administer.

Notice that since the Swedish dual income tax involves a flat tax rate on all capital income regardless of the taxpayer's income from other sources, a neutral taxation of owner-occupied housing could also be achieved by levying a proportional property tax at the rate $\tau = t \cdot i$ on the current market value of owner-occupied residential property. This approach was roughly followed in the Swedish tax reform of 1991 (see Chapter 2), and it may have pedagogical advantages in so far as home-owners and voters have difficulty understanding and accepting the notion of an imputed rent. On

average over the longer run, a plausible value for the risk-free nominal interest rate (statslåneräntan) could be 4 percent. If the flat capital income tax rate is set at 25 percent, as we proposed earlier, the neutral property tax rate implied by the equation $\tau = t \cdot i$ would be $\tau = 0.01$, i.e. 1 percent of the property value. Realistically, one may have to accept that assessed property values will tend to lag behind actual market prices so that at best only a rough approximation to tax neutrality can be attained.

Using data for 2008, Sørensen (2010, Appendix C) estimated that the current Swedish tax system implies an effective property tax rate on owner-occupied housing of about 0.68 percent of the current market value of the property. This implicit tax rate includes the actual property tax (fastighetsskatt), the tax on realized capital gains on housing (including the tax on deferred gains), and stamp duties. The proposal here is to replace all of these taxes by a genuine 1 percent property tax on owner-occupied dwellings. The revenue gain from such a reform would be roughly 13.8 billion SEK measured in 2008 prices.[50] Abolishing stamp duties on transactions in owner-occupied housing in favour of a higher property tax would improve economic efficiency, since the current stamp duties tend to create lock-in effects.

7.4 Reforming the taxation of business income in Sweden

The analysis in Chapter 4 and in Section 7.2 identified several distortions created by the current system of business income taxation in Sweden. First, we saw in Chapter 4 that a source-based business income tax on the normal return to investment works like a combination of a labour income tax and a tax on capital inputs used in domestic production. Chapter 4 showed that, for this reason, a source-based tax on the normal return is always more distortionary than a labour income tax. In addition, Section 7.3 has shown how the current system of business income taxation distorts the choice of organizational form, the choice between debt and equity finance and the choice between long-lived and short-lived business assets. The proposal for a business income tax reform presented in this section aims at minimising all of these distortions.

[50] This number is estimated as (1-0.68)/0.68 times the revenue from all taxes on owner-occupied housing (including stamp duties) collected in 2008.

An Allowance for Corporate Equity[51]

First and foremost, we propose to introduce a version of the so-called Allowance for Corporate Equity (ACE) originally advocated by by the Capital Taxes Group of the Institute for Fiscal Studies (1991). Variants of this system have previously been tested in Croatia (Rose and Wisswesser (1998), Keen and King (2002)), in Brazil (Klemm (2006)), in Italy (Bordignon et al. (2001)), and in Austria (OECD (2007, p. 130)). Moreover, an ACE system has been introduced in Belgium (Gérard (2006)) and most recently in Latvia.

Under the ACE system companies are allowed to deduct an imputed normal return on their equity from the corporate income tax base, parallel to the deduction for interest on debt. In this way the ACE seeks to ensure neutrality between debt and equity finance.

The theoretical case for an ACE in an open economy context follows from the analysis in Chapter 4. In that chapter we saw that, in a small open economy with near-perfect capital mobility, the burden of a source-based tax on the normal return to capital will tend to be fully shifted onto the less mobile domestic factors of production such as labour and land. Indeed, the domestic factors end up bearing *more* than the full burden of the source tax on capital, since the capital outflow generated by the tax reduces the productivity of (and hence the pre-tax return to) domestic production factors. The owners of these factors would therefore be better off if they paid the tax directly, since this would prevent the capital flight.

Apart from eliminating the distortionary tax on the normal return and the tax bias against equity finance, the ACE also offsets the investment distortions caused by deviations between true economic depreciation and depreciation for tax purposes. If firms write down their assets at an accelerated pace, the current tax saving from accelerated depreciation will be offset by a fall in future rate-of-return allowances of equal present value, since accelerated depreciation reduces the book value of the assets to which future rates of return are imputed. In fact, regardless of the rate at which firms write down their assets in the tax accounts, the present value of the sum of the capital allowance and the ACE

[51] The discussion of the ACE system in the present and the following subsections draws heavily on Griffith, Hines and Sørensen (2008) and Sørensen and Johnson (2010).

allowance will always equal the initial investment outlay, so the ACE system is equivalent to the immediate expensing of investment allowed under a cash flow tax (see Box 7.7).

Another attraction of the ACE is that the symmetric treatment of debt and equity eliminates the need for complicated anti-avoidance rules (e.g. so-called thin capitalisation rules) seeking to prevent abuse of interest deductibility: since firms get a deduction for an imputed interest on their equity as well as for the interest on their debt, multinational companies have no incentive to undercapitalise a subsidiary operating in a country with an ACE system.

More generally, the ACE would solve the increasingly difficult problem of distinguishing between debt and equity for tax purposes. In recent decades financial innovations have produced new financial "debt" instruments allowing firms to take advantage of interest deductibility even though these instruments are in many ways equivalent to equity. Under an ACE system the base for the ACE allowance would be determined by a simple criterion that does not require the tax authorities to evaluate whether any given corporate liability is truly "debt" or "equity". Under this criterion the ACE allowance would be imputed only to those liabilities on the company balance sheet to which no interest deduction is attached.

Box 7.7 Investment neutrality under the ACE system

Under a conventional system of business income taxation, accelerated depreciation allowances distort the behavior of firms as they effectively subsidise investment by allowing tax deferral. Accelerated depreciation can thereby induce low-productive investment that would not have been profitable in the absence of tax. On the other hand, if the depreciation allowed for tax purposes is less than the true economic depreciation of a particular asset type, the tax system will imply an artificial discouragement of investment in such assets.

One attractive feature of the ACE system is that it eliminates such distortions. Suppose, for example, that the tax code allows a company to bring forward 100 kronor of depreciation from year 2 to year 1, thereby reducing its tax liability in year 1 by 25

Box 7.7 cont.
kronor (assuming a 25 percent corporate income tax rate). Since the retained profit reported in the company's tax accounts for year 1 is now 100 kronor lower, the base for calculating the ACE allowance for year 2 falls by a corresponding amount. If the imputed interest rate on equity is 10 percent, this raises the company's tax bill for year 2 by 0.25x0.1x100 SEK. Furthermore, when the depreciation of 100 SEK is brought forward from year 2 to year 1, taxable profit in year 2 will increase correspondingly, triggering an additional tax bill of 0.25x100 SEK in that year. With a discount rate equal to the 10 percent interest rate imputed to the company's equity base, the net change in the present value of taxes paid by the company will therefore be

$$-0.25 \cdot 100 + \frac{0.25 \cdot (100 + 0.1 \cdot 100)}{1 + 0.1} = 0$$

Thus the tax benefit from accelerated depreciation is exactly offset by the fall in the future ACE allowance, so the pace at which companies write down their assets does not matter for the present value of the taxes they pay.

Because an investment always triggers a total allowance (depreciation plus ACE) with the same present value as the initial investment outlay, the government in effect finances a fraction of the initial investment expense equal to the tax rate. This fully compensates for the fact that a similar fraction of the cash inflows generated by the investment is taxed away. Thus the ACE does not affect the profitability of investment, so companies will undertake the same investments as they would have carried out in the absence of tax.

Calculating the base for the ACE

The Allowance for Corporate Equity is the product of the imputed rate of return (discussed below) and the company's equity base. Under an operational system, the equity base for the ACE could be calculated in the following way:

Equity base in previous year
+ taxable profits in previous year (gross of the ACE allowance)
+ exempt dividend received
+ net new equity issues
- tax payable on taxable profits in previous year
- dividends paid
- net new acquisitions of shares in other companies
- net new equity provided to foreign branches
= Equity base for current year

The change in the equity base from one year to the next is effectively new equity issues and equity created through retained earnings less return of equity. Several important points regarding the calculation of the equity base should be noted:

First, since the equity base for the current year includes the *taxable* profit made in the previous year, accelerated depreciation and other tax preferences will reduce the base for the ACE allowance, while any failure to allow full deduction for the true economic cost of production will increase the recorded equity base. In present value terms any miscalculation of the company's true annual profit is thereby automatically neutralized by an offsetting adjustment in future ACE allowances. This is key to ensuring the neutrality of the ACE system towards investment decisions.

Second, to avoid double counting of the equity base, the purchase of shares in other Swedish companies is subtracted from the equity base of the acquiring company, since the purchase price of these shares will be included in the equity base of the company that issued the shares. However, dividends would be added to the base of the acquiring company, as they reflect an increase in equity. Similarly, the revenue (and hence the capital gains) from the sale of an interest in a domestic company would add to the base.

Third, the net purchase of shares in foreign companies is also deducted from the equity base. Under the dividend exemption system applied in Sweden, this treatment of foreign share purchases ensures that investments in foreign assets which do not attract Swedish tax will not erode the Swedish tax base. At the same time dividends received from foreign companies add to the equity base in so far as they are reinvested in Sweden. This ensures that all domestic investments are included in the base for the ACE allowance irrespective of the source of (equity) finance.

Fourth, when a holding company finances investment in subsidiary companies by debt (or by a combination of debt and equity), its equity base calculated in the above manner will become negative, generating a *negative* ACE allowance and a corresponding *addition* to taxable profit. In this way the ACE system guarantees tax neutrality between debt and equity also for holding companies, since the negative ACE allowance offsets the amount of interest that the holding company is allowed to deduct from taxable profits. This ensures that holding companies have no tax incentive to finance acquisitions by debt rather than equity (provided the interest rate used to calculate the ACE allowance corresponds to the interest rate on the debt).

If dividends are paid out during the year or shares are redeemed, the equity used within the company decreases. Conversely, new share issues may increase the company's equity during the year. If no adjustments were made, the above rules for calculating the ACE allowance would imply an incentive to issue new equity only on the last day of the tax year and to pay out dividends or redeem shares only on the first day of the tax year. In particular, companies could increase their base for the ACE allowance for the current year by issuing shares on December 31 of the previous year and redeeming the entire amount (or paying out the revenue as a dividend) on January 1 of the current year. In this way the company could benefit from the full ACE allowance for the current year even though the actual equity in the company had only increased for a single day. By repeating the same operation around each successive New Year, the company could ensure permanent tax relief without actually increasing its equity-financed investment.

A simple way of preventing such tax avoidance would be to adjust the size of the ACE allowance to account for the timing of dividend payments and new equity issues. If E is the company's equity base calculated according to the rules described earlier, N is the revenue from new shares issued on day n^N of the current tax year, D is the dividend (or share redemption) paid out on day n^D of the current year, an i is the imputed rate of return on the company's equity base, the adjusted ACE allowance for the current year would be computed as

$$\text{Adjusted ACE allowance} = i\left[E + N\left(\frac{365 - n^N}{365}\right) - D\left(\frac{365 - n^D}{365}\right)\right]. \qquad (13)$$

This adjustment to the allowance is a straightforward calculation and should be necessary only on very few transactions in any one year. The adjustment would eliminate the scope for the type of tax avoidance mentioned above. For example, if new shares were issued on December 31 of the previous year only to be redeemed to shareholders on January 1 of the current year, the revenue from the share issue would be fully included in E in the above formula, but the adjustment for the subsequent redemption would ensure that the base for the ACE allowance would only increase by 1/365 of the revenue from the share issue, corresponding to the single day during which the company's equity was actually increased above its previous level.

Setting the imputed rate of return and allowing for tax losses

A tax is neutral for investment and financing decisions if it falls only on the net cash flow to shareholders, since any investment behaviour that maximises the present value of cash flows before tax will then also maximise the present value of after-tax cash flows.

The ACE system is in principle equivalent to such a neutral cash flow tax when the imputed rate of return equals the rate at which shareholders discount future ACE allowances: the system taxes cash returns to shareholders, but any injection of equity triggers a deduction of the same present value. For example, if shareholders inject an additional amount of equity E into the company, the company's ACE allowance will rise by the amount iE in all future years, where i is the imputed rate of return to equity. If shareholders also discount the value of the future deductions at the rate i, the present value of the additional deductions under the ACE will be $iE/i=E$. In present value terms taxpayers thus receive exactly the same deduction as under a cash flow tax that allows them to deduct the amount E up front.

Thus, to obtain full tax neutrality under the ACE, the imputed rate of return must be equal to the rate at which shareholders discount the tax savings from the company's future ACE allowances. This discount rate will depend on the degree of riskiness attached to these tax savings. As a benchmark, consider a hypothetical case in which the tax law allows full loss offsets, meaning that companies can carry their losses forward indefinitely with an interest rate added, and that shareholders receive a tax

credit for any remaining unutilised loss deduction in case the company goes bankrupt. In this case shareholders will receive the tax benefit from the ACE allowance with full certainty even if the company goes out of business, and so they will discount the tax savings from the ACE system at the risk-free rate of interest. To ensure tax neutrality, it is then sufficient to set the imputed rate of return equal to the risk-free rate proxied, say, by the interest rate on short term government bonds.[52]

In practice Swedish tax law does not allow full loss offsets. Although losses can be carried forward indefinitely they are not indexed, and unutilised losses remaining when a firm goes out of business cannot always be offset against other taxable income. Hence there will be some risk attached to the deductions for ACE allowances. The risk will differ across companies depending on how much they are affected by the restrictions on loss offsets. A substantial part of the risk is likely to stem from the probability that the company goes bankrupt. This risk will be reflected in the rate of interest at which the firm can borrow, so setting the imputed rate of return equal to the interest on the company's long term debt would presumably ensure rough neutrality of the ACE.

However, for administrative reasons it is necessary to use a common imputed rate of return for all companies rather than applying firm-specific rates (even if this involves some sacrifice of neutrality). Assuming a well-functioning and liquid market for corporate bonds, the discussion above suggests that the average interest rate on such bonds would be a natural benchmark for choosing the imputed rate of return to equity under the ACE.

Revenue effects of an ACE

As indicated earlier, the calculation of the ACE allowance can proceed on the basis of information available in the tax accounts that are already submitted to the tax authorities. From an administrative perspective, it should therefore be possible to introduce a full-blown ACE system from one year to the next.

The transition to the ACE only requires that a decision be made on the determination of the initial equity base of companies to be used during the first year after the reform. Ideally, the initial equity base should be set equal to zero in order to maximise the boost to

[52] This argument was originally made by Bond and Devereux (1995).

equity financed investment per krona of revenue lost. However, such a transition regime would require anti-avoidance rules to ensure that corporate taxpayers cannot qualify for an ACE allowance on existing equity by liquidating an existing company and starting up a new company in the same line of business. Such anti-avoidance legislation could complicate the ACE system. Further, since the ACE system does not grant a deduction for equity formed through accumulation of untaxed reserves (e.g. reserves stemming from accelerated depreciation), the revenue loss from an ACE system allowing a deduction for an imputed return on existing equity is likely to be limited.

To illustrate, consider the following figures (measured in billion SEK) from the aggregate balance sheet of all Swedish corporations at the end of 2007:[53]

1.	Injected equity (aktiekapital)	594.6
2.	Other "locked-up" capital (övrigt bundet kapital)	741.3
3.	"Free" equity (fritt eget kapital)	3,293.0
4.	Total equity (1+2+3.)	4,628.9
5.	Accumulated accelerated depreciation (ackumulerade överavskrivningar)	334,6
6.	Periodisation funds (periodiseringsfond)	187.7
7.	Other untaxed reserves (övriga obeskattade reserver)	22.2
8.	Total untaxed reserves (5+6+7)	544.5
9.	Shares in other Swedish firms (aktier och andelar i svenska koncern- och intresseföretag)	2,659.7
10.	Shares in foreign firms (aktier och andelar i utländska koncern- och intresseföretag)	1,520.1
11.	Equity base under the ACE system (4-9-10)	449.1

We see that the bulk of the equity in Swedish corporations consists of shares in other Swedish or foreign companies. As we explained earlier, these assets should not be included in the base for the ACE allowance, since the same amount of equity would otherwise attract an allowance in the parent company as well as in the subsidiary. We also recall that assets acquired through the

[53] The figures were provided by the Ministry of Finance and drawn from the FRIDA database.

accumulation of untaxed reserves do not attract an ACE allowance. Accounting for these properties of the ACE system, we see from the figures above that the equity base for the ACE allowance would have been 449 billion SEK in 2007. It is quite striking that this number is somewhat smaller than the 544.5 billion SEK of untaxed reserves.

In previous calculations in this report, we have assumed that the nominal rate of return required by international financial investors is 7 percent. In 2007 the average Swedish government bond rate (statslåneräntan) was roughly 4 percent, so the required 7 percent rate of return may be thought of as the sum of a risk-free interest rate and a risk premium of 3 percent. Assuming a 7 percent imputed rate of return to equity, the total ACE allowance granted to Swedish corporations would have amounted to 31.5 billion SEK. At the current 26.3 percent corporate tax rate, this allowance would have generated a static revenue loss of 8.3 billion SEK in 2007, assuming full loss offsets for companies with negative taxable profits. For comparison, the total revenue from the corporate income tax in the boom year of 2007 was 105 billion, and in the recession year of 2008 it was 85 billion.

Even if one allows for a higher risk premium in the imputed return to equity, these numbers suggest that the revenue loss from an ACE would be modest, amounting to around 10 percent of current corporate tax revenue. This surprisingly small revenue loss from the ACE could reflect several factors. First of all, the balance sheet figures above indicate that accelerated depreciation and other deductions from the corporate tax base significantly reduce the amount of *taxable* retained profits which add to the equity base for the ACE allowance. Second, the small equity base for the ACE could reflect that Swedish multinational companies hold large debt-financed ownership shares in foreign companies. When a holding company finances the purchase of shares in a subsidiary by means of debt, its equity base for the purpose of calculating the ACE becomes negative, as we explained earlier. When the subsidiary is based in Sweden, its issue of shares generates a positive equity base which offsets the negative base of the parent company so that the aggregate equity base is unaffected. However, if the subsidiary is a foreign company, its issue of shares is not included in the Swedish base for the ACE, so a Swedish holding company's debt-financed acquisition of shares in foreign companies reduces the aggregate equity base. Third, the limited revenue loss from the ACE could

reflect that a large part of the corporate income tax base consists of "above-normal" profits, that is, income above the imputed "normal" return to equity. Whether this income can be taxed without distorting economic incentives is an important question which we shall now address.

Corporate tax distortions under an ACE

A multinational company's investment decision involves two choices. First, the company must decide *where* (i.e. in which country) it wishes to locate its production. This is sometimes referred to as the investment decision on the "extensive" margin. Second, once the location decision has been made, the company must decide *how much* it wishes to invest in the chosen location. This is referred to as the investment decision on the "intensive" margin.

Provided the imputed rate of return to equity is set at the "right" level reflecting the rate at which investors discount the future cash flows from the company, the ACE system will eliminate the tax distortion to investment at the intensive margin. In other words, the ACE will in principle ensure that corporate investment in a given country is taken to point where the marginal pre-tax rate of return (net of economic depreciation) corresponds to the rate of return required by the international capital market, that is, the cost of corporate capital under an ACE will equal the world real interest rate.

Assuming a 5 percent real interest rate (including a risk premium) and a 2 percent rate of inflation, Table 7.3 provides an estimate of the cost of capital for widely held Swedish companies under the current corporate tax system and under an ACE system that allows a deduction for an imputed 7 percent nominal return on equity. The table considers debt-financed and equity-financed investment in machinery and equipment, accounting for the current Swedish depreciation allowances for these assets, and using estimates of the average rates of true economic deprecation based on the study by Hulten (2008).

Table 7.3 The cost of capital[1] (%) for widely held Swedish corporations under the current tax system and under an ACE system

Mode of finance	*Type of asset*	*Current corporate tax system*	*ACE system*
Debt	Equipment	3.85	5.00
finance	Buildings	4.00	5.00
Equity	Equipment	6.35	5.00
finance	Buildings	6.51	5.00

[1]The cost of capital is the real pre-tax rate of return required on the marginal investment.
Assumptions: Real interest rate = 5%. nflation rate = 2%.
Real rate of economic depreciation of machinery = 15%.
Real rate of economic depreciation for buildings = 3%.
Source: Own calculations based on Sørensen (2010, Appendix A)

The low cost of capital under the current tax system reflects the combined effects of full nominal interest deductibility and accelerated depreciation for tax purposes. Taken together, these features of the tax system drive the cost of capital below the international real interest rate, implying a negative investment tax wedge, as we already saw in Table 7.2. For equity-financed investment where no deduction for the cost of finance is currently allowed, accelerated depreciation is not sufficient to eliminate the marginal investment tax wedge, so for this mode of finance the cost of capital is higher than the international real interest rate under the current system. Table 7.3 shows that if the imputed return on equity is set at the "right" level, an ACE system will ensure that the cost of corporate capital equals the world real interest rate for all modes of investment finance and all asset types. This is what we mean by saying that the ACE would in principle eliminate all tax distortions to investment at the intensive margin.

However, a corporate tax system with an ACE would still tax any intra-marginal investment returns exceeding the international real interest rate. If these so-called rents are internationally mobile, that is, if a multinational company can earn "above-normal" returns regardless of the chosen investment location, a source-based corporation tax with an ACE allowance will still distort corporate investment decisions at the extensive margin. In particular, despite the incentive provided by the ACE allowance, a high domestic corporate tax rate could still induce multinationals earning high mobile rents to locate their investments abroad rather than in the domestic economy. Mobile rents are sometimes labeled as "firm-specific rents" since they derive from the earnings capacities of specific firms. A firm-specific rent may arise from, say, a firm's

possession of a specific technology, product brand or management know-how. Such intangible assets may generate above-normal profits regardless of the location of production, so a source-based tax on such rents may induce multinationals to consider an alternative location for their investment.

On the other hand, the rent earned on investment in a particular location may also be *immobile*, i.e., location-specific. As we explained in Chapter 4, such rents may arise from the exploitation of natural resources, but also from the presence of a good local infrastructure, and efficient public administration, a well-educated and disciplined local workforce etc. Since immobile rents reflect location-specific profit opportunities that are not available elsewhere, they can be taxed without distorting investment at the extensive margin. The ACE system is an ideal instrument for taxing location-specific rents because it also avoids investment distortions at the intensive margin, as we have seen.

Apart from representing rents, the corporate profits exceeding the "normal" return to capital may be a return to entrepreneurial effort and talent, that is, a form of labour income. In so far as this is the case, and if the supply of entrepreneurship is elastic, the corporate income tax will thus discourage entrepreneurial activity in the corporate organizational form. However, this does not imply that corporate "rents" should not be taxed. If these rents are really a form of labour income, they should be taxed as such in order not to distort the occupational choice between employment and self-employment and the choice between the corporate and the non-corporate form of business organization. The reform of the tax rules for closely held companies proposed below follows this principle.

In some cases the corporate tax base under an ACE system may also represent a risk premium on investment in a business activity involving a particularly high risk.[54] One might therefore worry that an ACE system will discourage risk-taking. However, at least since the contribution of Domar and Musgrave (1944) it has been recognized that the tax system may actually encourage risk-taking when losses are fully deductible. To illustrate, suppose an investor with initial wealth V_0 invests a fraction a of this wealth in a risky asset generating an uncertain rate of return x, while the remaining fraction 1-a is invested in a risk-free asset (e.g. a government bond)

[54] Here we are talking about so-called non-diversifiable risk against which investors cannot protect themselves by diversifying their portfolios.

yielding a "safe" rate of return *r*. Suppose further that the government levies a proportional tax at the rate *t* on the "rent" $(x-r)aV_0$ earned from the risky asset. If the tax code allows full loss offset so that the taxpayer receives a refund if the excess return *x-r* on the risky asset is negative, the investor's wealth V_1 at the end of the period will then be:

$$V_1 = \overbrace{r(1-a)V_0}^{\text{return on the safe asset}} + \overbrace{\left[x-t(x-r)\right]aV_0}^{\text{return on the risky asset}} = rV_0 + (1-t)(x-r)aV_0. \quad (13)$$

Now suppose that, in the absence of tax, the investor would have invested the fraction $\hat{a}$ of his wealth in the risky asset whereas in the presence of tax he chooses to invest the fraction

$$a = \frac{\hat{a}}{1-t} \quad (14)$$

in that asset. By inserting (14) into (13), we get

$$V_1 = rV_0 + (x-r)\hat{a}V_0 \quad (15)$$

which shows that if the investor reacts to the imposition of tax by adjusting his portfolio composition in accordance with (14), he will always end up with exactly the same net return on his total wealth as he would have earned in the absence of tax. Therefore, if the investor's portfolio had an optimal composition before to the introduction of the tax, it must be optimal for him to respond to the tax in accordance with (14), since he will then have the same expected net return and face exactly the same degree of uncertainty as before.[55] From (14) we thus see that the introduction of a tax on "rent" will actually *increase* the fraction of wealth invested in the risky asset, so from a *social* viewpoint the tax increases the amount of risk-taking, whereas the amount of *private* risk-taking is unchanged, since the government absorbs a share of all losses and gains equal to the tax rate *t*.

As shown by Sandmo (1989), this analysis extends directly to the case where investors can choose among many risky assets. In

[55] More precisely, by responding to the imposition of tax as described by (14), the investor is keeping constant the entire probability distribution of his final wealth, as pointed out by Sandmo (1989).

that case it is optimal for investors to increase the fraction of wealth invested in all risky assets by the same factor $1/(1-t)$ if the government introduces a tax at the rate t (with full loss offsets) on all returns above the risk-free rate r. Hence such a tax will not distort the pattern of investment in risky assets, but will simply increase the portfolio weight of all risky assets by the same percentage at the expense of investment in the risk-free asset.

These benchmark results assume that the tax system allows full loss offset, but in practice we have seen that there are limitations on loss offsets. With such limitations the effect of taxation on risk-taking becomes theoretically ambiguous, as taxes trigger offsetting substitution and wealth effects on the demand for risky assets (Sandmo, 1985). Still, even with imperfect loss offsets, a tax on above-normal returns will not necessarily reduce the total (social) amount of risk-taking. This will only occur if the limitations on loss offsets are so strict that the resulting negative wealth effect on the demand for risky assets outweighs the positive substitution effect (the risk-sharing effect) described by equation (14). In summary, it is unlikely that an ACE system will be neutral towards private risk-taking, as implied by (15), but it may well cause smaller distortions to risk-taking than the current corporate tax system. Below we will return to the issue how the tax system can avoid discouraging risk-taking.

A final tax distortion that will not be eliminated by the ACE is the incentive to shift taxable profits towards low-tax jurisdictions through the manipulation of the transfer prices on transactions between affiliates within the same multinational group of companies. The incentive to engage in transfer-pricing depends on the difference between the statutory corporate tax rates on the marginal profits earned in the domestic and foreign jurisdictions. So long as companies earn positive taxable profits under the ACE, and provided the statutory corporate tax rate remains the same, the incentive for transfer-pricing will also remain the same. However, the ACE system will in principle eliminate the need for complicated "thin capitalization" rules limiting the possibilities for multinationals to reduce their taxable profits by allocating their debts to affiliates in high-tax countries where the value of the interest deduction is high. Since the ACE system allows a deduction for an (imputed) interest rate on equity as well as debt, a multinational group can no longer erode the domestic tax base by

shifting from equity finance to debt finance of affiliates operating in the domestic economy.

The choice of tax rate under an ACE

The tax distortions identified above are relevant for the choice of tax rate under an ACE system. It is often argued that since an ACE narrows the corporate tax base, the statutory corporate tax rate should be raised to ensure an unchanged corporate tax revenue. On this basis the ACE system is sometimes criticised for exacerbating the problem of tax avoidance through transfer pricing, and for reducing inbound investment by multinationals earning high mobile rents (see, e.g., Bond (2000)).

However, the analysis in Chapter 4 provides no economic rationale for the view that the introduction of an ACE should be combined with a rise in the statutory tax rate. Since the ACE exempts the normal return from tax, it is equivalent to abolishing the source tax t_I in Figure 4.2. But even if taxes on the immobile domestic production factors (primarily labour) were raised by the full amount of the revenue loss B caused by the ACE, Figure 4.2 shows that the owners of the immobile factors would still enjoy a net income gain corresponding to area D, because of the productivity-enhancing effects of higher domestic investment. In other words, since the domestic immobile factors carry *more* than the full burden of a source-based tax on the normal return, it does not seem unfair that they should make up for the revenue loss from an ACE through a rise in other less distortionary taxes. To avoid problems with increased transfer pricing, we therefore propose that the statutory corporate tax rate in Sweden should not be raised after the introduction of the ACE. Indeed, if our previous proposal to cut the general personal capital income tax rate to 25 percent is followed, it would be natural to cut the statutory corporate income tax rate from the current level of 26.3 percent to 25 percent to reestablish the alignment of the two tax rates intended by the 1991 tax reform. Such a modest cut in the corporate tax rate could be motivated by the growing international mobility of capital and profits and the resulting downward pressure on corporate tax rates in Sweden's competitor countries.

The suggestion not to raise the statutory corporate tax rate is supported by the work of De Mooij and Devereux (2008) who use a computable general equilibrium model to examine the introduction of an ACE in EU countries. They find that where an ACE is introduced and funded by an increase in consumption taxes, GDP increases across EU countries on average by 2.4 percent.[56] By contrast, if an ACE is funded by an increase in the company tax rate, the authors estimate that GDP will only increase by 0.8 percent and that consumer welfare will fall as the higher company tax rate causes a significant erosion of the tax base due to profit shifting to other countries via more aggressive transfer pricing and due to less domestic investment.

In the two-year period 2007-2008 when the corporate income tax rate was 28 percent, the average annual revenue from the Swedish corporate income tax was 95 billion SEK, so the average corporate income tax base was 95/0.28 = 339.3 billion SEK. The calculations presented earlier suggested that under an ACE system the tax base would have been roughly 10 percent smaller, amounting to about 0.9x339.3 = 305.4 billion kronor. With an ACE system in place, our proposal to reduce the corporate income tax rate from the current 26.3 percent to 25 percent (corresponding to the proposed capital income tax rate) would thus imply a revenue loss of about 0.013x305.4 = 4 billion SEK. In addition, we saw earlier that the ACE allowance itself would imply a revenue loss of around 8-9 billion SEK, starting from an initial corporate tax rate of 26.3 percent, so the total static revenue loss from our proposed changes to the corporate income tax would be roughly 12-13 billion SEK. For comparison, Section 7.3 estimated that our proposed property tax reform and the proposal to move to a uniform 25 percent capital income tax rate on all savings income would generate an additional revenue of about 17 billion SEK. Our proposal for a tightening of the taxation of capital gains on shares would also yield some extra revenue. It therefore seems safe to assume that our proposals for a reform of the taxation of savings income and property could easily finance the introduction of an ACE plus the modest cut in the corporate income tax rate from 26.3 percent to 25 percent.

[56] Similar results are found by Keuschnigg and Dietz (2007) who examined the introduction of an ACE/DIT for Switzerland and by Radulescu and Stimmelmayr (2007) who studied the introduction of an ACE for Germany.

The taxation of closely held corporations

As argued by Hagen and Sørensen (1998), the organizational form of a closely held corporation is likely to be a relatively close substitute for the legal form of a proprietorship, since both types of business tend to be dominated by active owner-managers who have invested the bulk of their personal wealth in the firm. By contrast, widely held corporations tend to be run by appointed professional managers and to obtain their funding from a large group of diversified investors, so this organizational form is probably less substitutable for that of a closely held company. While it is clearly desirable that the tax rules are as neutral as possible across all organizational forms, the above observations suggest that it is particularly important to strive towards neutral taxation of proprietorships and closely held corporations with active owners (i.e. the firms subject to the so-called 3:12 rules).

In Section 7.2 we saw that proprietors are currently taxed at the corporate tax rate on profits retained in their business. Profits withdrawn from the business are taxed as capital income up to a cap given by an imputed return to the net business equity, while distributed profits exceeding the imputed return are subject to the progressive labour income tax. A roughly similar tax treatment of closely held corporations with active owners could be achieved if the 3:12 rules were reformed along the following lines:

Suggested reform of the 3:12 rules

1. An imputed normal return to corporate net equity is exempt from corporate income tax, in line with the ACE proposal
2. Whenever the sum of the dividend and any realized capital gain on the company's shares is less than the ACE allowance, the shareholder's personal capital income tax base equals the minimum of the ACE allowance and the company's profit
3. If the sum of the dividend and the realized capital gain exceeds the ACE allowance, the personal capital income tax base equals the ACE allowance, and the excess dividend + capital gain is 'grossed up' and taxed as labour income, with a credit for the underlying corporation tax
4. The basis value of shares is stepped up every year by the ACE allowance minus the dividend pay-out

Some simple numerical examples may illustrate the working of these rules. Consider a closely held company with an equity base of 1000 and suppose the imputed rate of return to equity is 10 percent so that the ACE allowance is 100. If the shareholder receives a dividend of 40, he will still have to pay personal capital income tax on the full ACE allowance of 100, so he cannot defer tax on the normal return by having the company retain its profit. However, the basis value of his share will be stepped up by the amount 100 – 40 = 60 by which the ACE exceeds the dividend, so if he realizes his share at some later later stage, he will not be liable to capital gains tax on the normal return that has already been taxed.

Suppose alternatively that, in addition to the dividend of 40, the shareholder realizes a capital gain of 90 in the year considered. His total realized income will then be 40 + 90 = 130, exceeding the ACE by an amount of 30. The company profit underlying this "excess return" has already been taxed as corporate income at a rate of, say, 25 percent, so the corresponding pre-tax income is 30/(1-0.25) = 40. For tax purposes this income is treated as a reward to the work effort of the active shareholder and is therefore taxed as labour income at a marginal rate of, say, 50 percent, implying a gross labour income tax bill of 20. However, since the underlying corporate income has already borne a tax of , the shareholder is granted a corresponding tax credit, leaving a net labour income tax bill of 20 – 10 = 10.

These reformed 3:12 rules for corporate owner-managers are assumed to operate in an environment where the corporate income tax rate, the capital income tax rate and the tax rate on the retained earnings of proprietors (allocations to expansion funds) are all identical. The proposed rules would then put proprietors and owners of closely held companies on an equal footing: any income up to a cap given by the normal return to business equity would be taxed only once at the capital income tax rate, regardless of whether it is paid out (or realized as a capital gain) or not; and any realized income above that level would be taxed as labour income. In particular, the new 3:12 rules proposed here would eliminate the gain from deferral of tax on the normal return through the retention of profits, thereby ensuring a fully neutral taxation of retained and distributed "normal" profits. In this way the proposed rules would ensure rough tax neutrality towards the choice between investment financed by retained earnings and investment financed by new equity.

Under the new 3:12 rules summarised in points 1. through 4. above, the imputed capital income of owners of closely held companies would no longer include the Wage-Based Allowance (WBA) granted by current tax law (described at the start of Section 7.2). This could eliminate a potentially serious tax distortion to the choice of technology. Under current tax rules investment in equipment that requires hiring of more employees triggers an additional WBA, thereby allowing taxpayers subject to the 3:12 rules to have a larger share of their income taxed at the low capital income tax rate rather than at the high marginal labour income tax rate. In this way the tax code provides an artificial incentive to invest in types of capital which are complementary to labour input. By contrast, investment in labour-saving technology is punished by the current 3:12 rules, since it implies a cut in the WBA, thus increasing the share of entrepreneurial income which is taxed at the high marginal labour income tax rate.

The resulting distortions to investment choices could be quite serious, as illustrated by the numerical examples given in Table 7.4. The table shows estimates of the cost of capital under the current 3:12 tax rules. In line with the assumptions underlying Table 7.3, the table below defines the cost of capital as the minimum real pre-tax rate of return (net of depreciation) needed to generate the real after-tax return required by investors, assuming a five percent real interest rate and a two percent inflation rate.

Table 7.4 Effect of the wage-based allowance on the cost of capital for closely held corporations

	Cost of capital (%) for investment financed by		
	New equity	*Retained earnings*	*Debt*
Marginal ratio of employee wage bill to capital stock: 0	3.3	7.2	2.0
Marginal ratio of employee wage bill to capital stock: -0.05	3.9	7.8	2.6
Marginal ratio of employee wage bill to capital stock: +0.05	2.7	6.5	1.4

Source: Own calculations, based on Sørensen (2010, Appendix A and C).

As a benchmark, the first row in Table 7.4 shows the required return on an investment that does not change the company's wage bill. The different numbers in this row reflect the differential tax treatment of the different modes of investment finance discussed

earlier. The second row shows the cost of capital associated with a labour-saving investment where the return takes the form of a 5 SEK drop in the company's tax bill for every 100 SEK invested, implying a five percent real pre-tax rate of return, corresponding to the assumed international real interest rate. We see that such a labour-saving investment has a higher cost of capital for all modes of finance, because it implies a drop in the wage-based allowance included in the imputed (low-taxed) return to equity. For comparison, the third row in Table 7.4 shows the cost of capital for an investment in capital which can only be utilized if the company is willing to spend an additional 5 SEK on labour costs for every 100 SEK invested. We see that the cost of capital is significantly lower for such an investment. Thus the wage-based allowance encourages closely held companies to invest in technologies where capital is complementary to labour at the expense of labour-saving technologies. This tax distortion lowers the overall productivity of capital, just like the tax distortions to the choice among asset types and modes of finance discussed earlier.

In itself, the abolition of the wage-based allowance would tend to increase the average tax burden on (the owners of) closely held companies. At the same time, however, the introduction of the ACE system would eliminate the current double taxation of the normal return to corporate equity. Moreover, the owners of closely held companies would benefit from the abolition of the värnskatt proposed in Chapter 6.

Entrepreneurship, risk-taking and loss offsets

The current tax rules for income from closely held firms seek to prevent the transformation of high-taxed labour income into low-taxed capital income, as we explained in Chapter 2. Over the years, these tax rules have generated a lot of controversy in the Swedish tax policy debate. Much of the disagreement on the legitimacy of the tax rules for closely held firms (in particular the 3:12 rules) seems to reflect different views on the nature of the business income exceeding the imputed normal return to the equity invested in these firms. Under current tax law, this income is viewed as ordinary labour income to be taxed according to the progressive labour income tax schedule.

However, critics of the current Swedish business tax regime have emphasized that the "above-normal" return to business investment typically represents a reward for risk-taking and/or a reward for entrepreneurial creativity and effort. These critics argue that a high marginal tax rate on business income will reduce entrepreneurial effort and risk-taking, thereby hampering the start-up and growth of new firms which is an important source of economic growth (see, e.g., Henrekson and Sanandaji, 2004).

If the taxation of risky income streams were purely proportional and the tax system offered full loss offset – granting an immediate credit for losses or allowing unlimited carry-forward of losses with interest – we have already seen that the tax system would actually tend to stimulate (social) risk-taking. Under such circumstances the government effectively participates as a silent partner in each investment project, sharing symmetrically in all gains and losses. In this way the government absorbs a share of the risk corresponding to the tax rate, thereby allowing investors to expand their risky activities without increasing their private risks.

However, in practice high levels of business income are taxed at rising marginal rates, and the tax code does not offer full loss offsets. For example, at the end of Section 7.1 we described the limitations on the deductibility of capital losses on shares. Moreover, business losses are generally not deductible against other income during the same year, and although they may be carried forward indefinitely and deducted against future income from the same business, no interest is added to preserve the present value of the deduction. Finally, if a sole proprietor records a business loss during the year he goes out of business, he may only deduct 70 percent of the loss against his taxable capital income during the following two years.

A tax system imposing high marginal tax rates on the gains to entrepreneurship but absorbing only a small fraction of losses may indeed hamper entrepreneurial activity. It is also understandable if such a system is seen by the business community as being unfair. Considerations such as these seem to have motivated the 2006 reform of the 3:12 rules which involved a significant expansion of the Wage-Based Allowance included in the imputed return that is taxed as capital income. This reform lowered the average tax burden on the owners of closely held companies, but unfortunately it also exacerbated the tax distortion to the choice of technology, as we have seen above. Moreover, the very generous risk premium

included in the imputed return on equity in closely held companies tends to imply a tax subsidy to investment financed by new equity, as Table 7.2 revealed.

Instead of such measures which tend to generate new distortions, it seems more rational to counter the potential tax penalty on entrepreneurial activity by introducing a more symmetric tax treatment of gains and losses. The asymmetric treatment of gains and losses under the current system stems from the fact that losses are not fully refundable. While they can be carried forward indefinitely, they are not indexed and hence lose their real value over time. In addition some losses are effectively wasted because of the various limitations on loss offsets.

A way to address this issue could be to liberalize the current loss utilisation rules by allowing business losses to offset other tax liabilities during the same year, such as VAT, Pay-As-You-Earn income tax and fringe benefits tax. This would increase the utilisation of losses in the year they are incurred, while still capping the amount of losses that can be used in any year to somewhat limit incentives to artificially create losses.

This approach would provide many of the benefits of full refundability, albeit to a lesser degree. For example, it would provide some benefit to businesses without income to absorb start-up or closing-down expenditure. Consequently this would limit the amount of losses that are wasted.

7.5 Summary

This chapter identified a number of tax distortions to the pattern of saving and investment in Sweden. The main distortions to the savings pattern stem from the lenient taxation of retirement saving and saving channelled into owner-occupied residential property. The tax subsidies to these forms of saving were estimated to generate a total deadweight loss of about 6½-10½ billion SEK measured in 2008 prices. The deferral of capital gains tax until the time of realization causes a further distortion by generating a tax preference for assets whose returns accrue mainly in the form of capital gains, and by hampering portfolio reallocation towards assets with a higher social (pre-tax) return.

On the investment side, the source-based business income tax (mainly the corporation tax) works like a combination of a labour

income tax and a tax on capital input into domestic production. The corporation tax therefore tends to be more distortionary than the labour income tax. In addition, the taxation of business income distorts the choice between alternative forms of business organization, between debt and equity, and between short-lived and long-lived assets. We estimated that the combined deadweight loss from the tax distortions to the choice of organizational form and to the debt-equity choice could amount to more than 32 billion SEK in 2008 prices; a huge distortion compared to the 83 billion SEK corporate tax revenue in that year.

To address the inefficiencies in the taxation of savings income, we proposed the following reform measures:

- Tax all returns to financial saving (including the return to institutional saving) at a common rate of 25 percent
- Replace the current municipal property tax, the current tax on realized capital gains on owner-occupied residential property and the stamp duties on transactions in such property by a flat property tax rate of 1 percent on a realistic assessment of the market value of the property
- Tax all capital gains on listed shares on an accruals basis and tax the unrealized gains on unlisted shares resulting from the retention of corporate profits on a current basis, with a corresponding step-up of the basis value of shares for the purpose of calculating future capital gains tax, and with an obligation for the company to pay the tax on the shareholder's behalf

The replacement of the existing property taxes by the proposed 1 percent tax on residential property values was shown to provide a roughly neutral tax treatment of financial savings and savings invested in owner-occupied housing, given a 25 percent capital income tax rate. The revenue gain from the first two measures above was estimated to be about 17 billion SEK (2008 level).

To reduce tax distortions to the level and pattern of business investment, we proposed a business tax reform along the following lines:

- Introduce an Allowance for Corporate Equity (ACE) in the form of a deduction for an imputed normal return to equity.
- Reform the 3:12 rules to secure that any income up to a cap given by the normal return to business equity (the ACE) is taxed only once at the capital income tax rate, regardless of whether it is paid out (or realized as a capital gain) or not. Income above the ACE should be taxed as labour income when it is realized in the form of a dividend or a capital gain, with a credit for the corporation tax already paid.
- Liberalize the rules for offset of business losses, e.g. by allowing business losses to offset other tax liabilities for the same year such as VAT, Pay-As-You-Earn income tax and fringe benefits tax.
- Reduce the corporate income tax rate from the current 26.3 percent to 25 percent, corresponding to the proposed capital income tax rate.

Our analysis showed that the introduction of an ACE would in principle eliminate the tax distortion to the choice between debt and equity and between different business assets. It would also eliminate the tax distortion to the input choice between labour and capital in the small open Swedish economy. The proposed reform of the 3:12 rules would ensure a roughly identical tax treatment of closely held companies and proprietorships, thus eliminating the distortion to the choice between these two closely substitutable forms of business organization.

The long-run revenue loss from an ACE allowance for corporate equity was estimated to be 8-9 billion SEK in 2008 prices, close to 10 percent of corporate tax revenue. The limited revenue loss reflects inter alia that the equity of the foreign affiliates owned by Swedish multinationals does not qualify for the ACE allowance and that the practice of accelerated depreciation reduces the base for the allowance. The proposed cut in the corporate tax rate to 25 percent was estimated to add about 4 billion SEK to the revenue loss, implying a total revenue loss of 12-13 billion kronor from the corporate tax reform. According to our estimates, this revenue loss could easily be financed by the proposed changes in the taxation of savings income.

Through such a reform ensuring much greater neutrality in the taxation of income from saving and investment, a considerable gain in economic efficiency could be reaped.

8 The Swedish tax system: summary and policy proposals

This report provides a critical overview of the current Swedish tax system. It shows how deviations from the principles of tax neutrality and uniformity create a number of tax distortions, and it provides quantitative estimates of the loss of economic efficiency caused by the most important distortions. Against this background, the report offers a number of tax reform proposals that could eliminate or at least reduce the various distortions without eroding public revenue. In the following, we summarize the main insights and policy proposals from each chapter in the report.

Chapter 1: The Swedish tax system in international context

The first chapter considers the current Swedish tax system in the context of international tax policy trends. The chapter summarises the recent policy trends in OECD countries in the following way:

- The ratio of total tax revenue to GDP has been fairly stable
- There has been a trend away from personal income tax towards social security contributions
- Top marginal personal tax rates have fallen considerably, but the average tax rate paid by the average worker has hardly changed
- Statutory corporate income tax rates have also fallen substantially, but the ratio of corporate tax revenue to GDP has been relatively stable as the corporate tax base has expanded
- There has been a move away from the imputation system of dividend tax relief in Western Europe towards simpler systems involving reduced personal tax rates on dividends

- The share of revenue coming from VAT has risen, but the revenue share of excises has fallen even more, so the share of total revenue stemming from consumption taxes has fallen
- The revenue from environmental taxes has slightly declined relative to GDP
- The total revenue from property taxes has been rather stable relative to GDP, although several countries have abolished their taxes on net wealth

Whereas the total tax-to-GDP ratio has been roughly constant in the OECD area as a whole, Sweden has reduced the total tax burden by several percentage points in recent years, in part by lowering the tax burden on labour. As a consequence, Sweden has been overtaken by Denmark as the country with the highest ratio of taxes to GDP. Nevertheless, Sweden still taxes labour income more heavily than most other OECD countries. Like Denmark, Sweden stands out by relying more heavily on the personal income tax than the average OECD country. Social security taxes and the VAT generate about the same share of total revenue in Sweden as in the average Western European EU country, whereas specific consumption taxes, property taxes and the corporate income tax all contribute a smaller fraction of total revenue in Sweden than in the EU15 area.

Chapter 2: The Tax Reform of the Century

To provide some historical perspective on current Swedish tax policy, Chapter 2 describes the background for and main elements of the great Swedish tax reform of 1991, often referred to as the Tax Reform of the Century. The reform was very ambitious, involving a combination of tax rate cuts and tax base broadening amounting to about 6 percent of GDP. The 1991 reform was also remarkable in other respects. It was the culmination of a long process of investigation in which alternative blueprints for tax reform were carefully studied by various government committees involving academic tax experts, civil servants, politicians and representatives of the most important interest groups. During this long process of detailed analysis, the key players in the Swedish tax policy debate reached a high degree of consensus concerning the main weaknesses of the old tax system and the most promising

directions for tax reform. Hence the Tax Reform of the Century was guided by a clear set of principles which ensured a high degree of consistency in the implementation of the reform. The consequences were almost revolutionary. For example, the statutory corporate income tax rate was roughly cut in half, but the resulting revenue loss was fully offset by a broadening of the corporate tax base. Moreover, the tax reform involved all the major parts of the tax system, including the personal and corporate income tax, social security taxes, the VAT, and property taxes.

The tax reform of 1991 introduced the blueprint that has now become known as the Nordic dual income tax which separates the taxation of capital income from the taxation of other income. The dual income tax combines progressive taxation of labour and transfer income with a relatively low proportional tax on capital income. A low flat tax rate on capital income was adopted as a simple way of compensating for the fact that the capital income tax is levied on the nominal rather than the real return to saving. It was also introduced to pave the way for a significant broadening of the capital income tax base and a move towards a more uniform taxation of the various forms of income from capital, including capital gains. The flat capital income tax rate was set at 30 percent, in line with the corporate income tax rate, whereas the top marginal personal tax rate on labour income ended up at 51 percent.

The guiding principles of the Tax Reform of the Century were *neutrality* and *uniformity* of taxation. The reform was remarkable for the zeal with which it pursued these goals. Apart from motivating a dramatic broadening of the bases for capital income taxation and business income taxation, adherence to the principles of neutrality and uniformity also meant that several other types of income that had previously been tax-free or tax-favoured became subject to tax at standard rates. In a similar way, the Value Added Tax became much more broadly based, and a uniform VAT rate on all (taxable) goods and services was adopted.

This drive towards neutrality and uniformity of taxation was not only seen as a way of improving economic efficiency; it was also perceived as a way of ensuring a more equitable tax system. Subjecting all forms of income and consumption to tax at the standard rates strengthened horizontal equity, that is, the principle that taxpayers with the same ability to pay should pay the same amount of tax. It was also argued that the base-broadening

measures of the tax reform promoted the goal of vertical equity, i.e., the principle that taxpayers with a greater ability to pay should foot a larger tax bill. The argument was that, in practice, the many deductions and special provisions in the old tax system tended to benefit the rich and sophisticated taxpayers who had better opportunities for tax planning.

The politicians behind the tax reform were thus keen to emphasize that it would be distributionally neutral, despite the large cut in marginal tax rates and the extensive broadening of tax bases. Subsequent empirical studies suggest that the reform did in fact have very little impact on the total amount of redistribution of personal annual incomes.

In a long run perspective, the greater neutrality in the taxation of different savings vehicles improved the allocation of savings. But perhaps the greatest achievement of the 1991 tax reform was the reduction of the average and marginal tax burden on labour (which was extremely high before the reform) combined with a higher average and marginal effective tax rate on housing investment (which was heavily subsidised by the old tax system). Even with very conservative assumptions on the responsiveness of labour supply to taxation, the cut in marginal tax rates significantly reduced the loss of economic efficiency from the taxation of labour.

However, these long run efficiency gains did come at a short term cost. In the short run the improved incentives for financial saving and the heavier tax burden on investment in housing and other consumer durables reduced the aggregate demand for goods and services, thereby exacerbating the serious recession of the early 1990s.

In summary, the tax reform of 1991 represented a bold experiment in tax policy based on a clear set of principles that led to a much more consistent tax system. Although the timing of the reform turned out to be unfortunate by tending to worsen a serious recession, there are strong reasons to believe that the Tax Reform of the Century contributed to a more efficient allocation of resources in the long run without sacrificing the goal of equity in taxation.

Chapter 3: Trends in Swedish tax policy since the Tax Reform of the Century

Chapter 3 briefly reviews the most important tax policy changes since the early 1990s. The new design for the Swedish tax system emerging from the grand tax reform of 1991 has stood the test of time in several important ways. In the sphere of personal income taxation, the basic principles of the dual income tax have by and large been maintained. The introduction of an Earned Income Tax Credit in 2007 was an important innovation in the taxation of labour income. The EITC was mainly intended to stimulate labour force participation, whereas the marginal tax rate cuts included in the 1991 reform were more focused on the goal of increasing the hours worked by those already employed. Yet both of these policy measures aimed at increasing total labour supply, so in this sense they are quite consistent.

In the area of corporate income taxation Swedish policy makers have stuck to the important principle of combining a broad tax base with a relatively low tax rate, rather than trying to fine tune the level and composition of business investment through various special deductions and allowances that would require a higher tax rate to generate the same revenue. Still, it is highly doubtful whether the various tax concessions granted to active owners of closely held corporations since the 1991 tax reform have improved the neutrality of the tax system towards the choice of alternative forms of business organization.

Recent years have witnessed a move towards reduced social security taxes for selected groups in the labour market and the introduction of a tax credit for the purchase of household-related services. These tax policy changes might be seen as an unwarranted departure from the principles of uniform taxation underlying the Tax Reform of the Century. However, as argued in chapters 5 and 6 of the report, there may be a good theoretical case for policies of this kind, even if the specific design of the current policies may be less than optimal.

The most important departures from the principles of the 1991 tax reform have been the move towards a differentiated VAT, the introduction of an additional surtax on high-income earners (the värnskatt), and the substantial tax subsidy to investment in owner-occupied housing implied by the 2008 property tax reform. The analysis in chapters 5 through 7 of this report strongly suggests

that these breaks with the principles of the 1991 tax reform were unfortunate and should be reconsidered.

Chapter 4: The deadweight loss from taxation in Sweden

When evaluating the need for a restructuring of the tax system, policy makers need to have some idea of the seriousness of the economic distortions caused by the various taxes. Chapter 4 seeks to provide such information by estimating so-called marginal deadweight losses from the most important taxes in Sweden. The marginal deadweight loss is the difference between the amount that would be needed to compensate taxpayers for a rise in some tax rate and the government's net revenue gain from the tax hike. As the chapter explains, the marginal deadweight loss created by an increase in some tax rate is equal to the degree of self-financing (*DSF*) associated with a cut in this tax rate. The *DSF* is defined as the fraction of the initial static revenue loss which is recouped as the various tax bases expand due to the behavioural responses to the lower tax rate. The method of calculating degrees of self-financing developed in Chapter 4 allows for the interaction among tax bases, i.e., the fact that an expansion (contraction) of one tax base has positive (negative) spillover effects on other tax bases. Our analysis also accounts for the different impacts of residence-based taxes on saving (such as the personal capital income tax) and source-based taxes on investment (e.g. the corporation tax).

We calculate degrees of self-financing associated with a cut in the marginal effective tax rates on 1) labour income, 2) consumption, 3) business income (taxed under the source principle), and 4) savings income (taxed under the residence principle). Our calculations are based on recent national income accounts data and revenue data for Sweden, and our benchmark estimates of the *DSF* assumes an elasticity of taxable labour income which is a bit conservative in the light of recent empirical estimates of this parameter for Sweden. When calibrating the interest elasticities of savings and labour supply about which relatively little is known, we exploit the links between these elasticities and the elasticity of taxable labour income implied by economic theory.

Given the set of benchmark parameter values that we considered to be most plausible, we estimate that a cut in consumption taxes

will generate a dynamic revenue gain of about 16 percent of the initial static revenue loss. An across-the-board cut in the marginal tax rate on all labour income is found to have a degree of self-financing of about 24 percent, and a cut in the business income tax is estimated to have a *DSF* close to 30 percent, while the *DSF* generated by a cut in the savings income tax is found to be 36 percent.

In all the scenarios considered, we find that the *DSF* associated with a cut in indirect taxes on consumption is lower than the *DSF* for the three other tax instruments included in our analysis. The reason is that part of the consumption tax base is inelastic, since a part of aggregate consumption is financed out of public transfers to retirees and other individuals who have permanently left the labour market so that their labour supply does not respond to a change in the consumption tax rate.

When the initial marginal effective tax rate on business income is positive, we also find that a business income tax cut (e.g. a cut in the corporate income tax rate) will always have a higher *DSF* than a cut in the labour income tax rate. The explanation is that in a small open economy with perfect capital mobility, the business tax cut induces a capital inflow and a resulting rise in domestic investment which continues until the benefit from the tax cut has been fully passed on to domestic workers through a rise in real wages. Just like a labour income tax cut, a business tax cut therefore stimulates labour supply, but in addition it generates a capital import which expands the business income tax base further, thereby inducing a larger dynamic revenue gain than the dynamic gain from a labour income tax cut with the same static revenue cost.

Since a lower *DSF* indicates a lower marginal efficiency loss from taxation, our finding that indirect consumption taxes have a lower *DSF* than other taxes might seem to call for a shift from direct to indirect taxation. However, the reason for the low marginal deadweight loss from consumption taxes is that they are partly paid by individuals outside the labour force whose labour supply does not respond negatively to a higher consumption tax rate. Most of these individuals have relatively low current incomes. Moreover, an indirect consumption tax cannot account for the specific circumstances of the individual taxpayer, whereas the progressive personal labour income tax is based on the taxpayer's ability to pay. Concerns about equity may therefore make a shift

from direct to indirect taxation undesirable even though such a shift would improve economic efficiency.

Another robust finding is that the *DSF* for a source-based business income tax like the corporation tax is always higher than the *DSF* for the labour income tax when the initial marginal effective tax rate on business investment is positive. In that case the corporation tax works in part like a labour income tax and partly as a selective tax on the use of capital inputs in domestic production. By lowering the marginal effective tax rate on investment to zero and recovering the revenue loss through a higher tax on labour income, policy makers can avoid the distortion to the use of capital inputs without making workers worse off. To put it another way, since the marginal deadweight loss for the business income tax is larger than that for the labour income tax, it is efficient to shift from the former to the latter tax, and since the burden of the business income tax falls on workers anyway, there is no negative impact on income distribution from such a tax shift.

However, the prescription of a zero effective tax rate applies only to the *normal* return to business investment, that is, the return on the marginal investment which is just barely worth undertaking. As stressed in Chapter 4, intra-marginal profits arising from location-specific rents can be taxed without distorting investment incentives. Chapter 7 of the report explains how the taxation of the normal return can be separated from the taxation of rents in practice.

As a final policy observation, the sensitivity analysis in Chapter 4 indicates that even though there is considerable uncertainty regarding the *DSF* for the savings income tax, the DSF for this tax is larger or at least as large as the *DSF* for the other taxes, unless the uncompensated interest elasticity of saving takes an implausibly large negative value. This suggests that the Swedish dual income tax system which allows the statutory (marginal) capital income tax rate to be lower than the marginal labour income tax rate promotes economic efficiency by avoiding an excessively high marginal deadweight loss from the taxation of savings income.

For a proper interpretation of the results presented in Chapter 4, it is important to be clear about the nature and the time horizon of the policy experiments considered. The estimated degrees of self-financing relate to a long time horizon where the economy has fully adjusted to the changes in tax rates. In particular, while our

assumption of perfect international capital mobility may be a reasonable approximation in the long run, it may take considerable time for the domestic capital stock to adjust fully to a change in tax rates, since there are costs of installing new capital equipment, and since firms cannot easily shift their operations and productive assets across borders. In the short and medium term (physical) capital is therefore only imperfectly mobile, so in the shorter run a part of the burden of a source-based business tax on the normal return will be borne by the owners of business assets.

Further, when considering the effects of a change in the labour income tax, Chapter 4 assumes an identical change in the marginal tax rate on all labour income, from the first to the last krona earned. The chapter does not consider the specific effects of changing the marginal tax rate for top income earners. As the analysis in Chapter 6 makes clear, the degree of self-financing associated with such a policy experiment will be higher than the *DSF* for an across-the-board change in the marginal tax rate for all workers.

In a similar way, when analysing changes in the marginal tax rates on business income and savings income, Chapter 4 implicitly assumes that the tax rate changes applied uniformly to all forms of investment and saving, respectively. In so far as a change in the average value of the effective marginal tax rate stems from a selective tax rate change applying only to certain forms of investment or savings, there will be additional distortions that were not accounted for in our measures of marginal deadweight losses. Chapter 7 explains how one may quantify these additional efficiency losses from non-uniform taxation.

The measure developed in Chapter 4 of the *DSF* for a change in the effective indirect tax rate on consumption likewise assumes that the tax rate change applied equally to the consumption of all goods and services. If the change in the tax rate applies only to certain goods and services, there will be additional effects on economic efficiency which are explored in Chapter 5.

Chapter 5: Taxes on consumption and pollution

Chapter 5 considers the design of indirect taxes, including taxes on polluting activities. Because they are impersonal, indirect taxes are generally inferior instruments for the redistribution of income

compared to the progressive personal income tax and targeted income transfers. Yet indirect taxes may serve a useful role as a supplementary source of revenue that helps to avoid an "overburdening" of the income tax. Indirect taxes are also an important means of internalizing negative spillover effects from consumption and production (so-called negative externalities), including external environmental effects, and they may help to address problems of myopia and self-control relating to certain forms of addictive unhealthy consumption.

Optimal tax theory also suggests that a differentiated structure of indirect tax rates can help to alleviate the negative impact of taxation on labour supply. However, the information needed to implement the theoretically optimal differentiated indirect tax rate structure is not and probably never will be available. For this and a number of other reasons, including administrative simplicity, we argue that a general indirect tax such as the VAT should be uniform across all goods and services. Our quantitative analysis suggests that a move from the current differentiated Swedish VAT to a uniform VAT could generate a gain in economic efficiency somewhere between ½ and 1 percent of total private consumption. At the same time we acknowledge the case for a reduced fiscal burden on certain household-related market services which are very close substitutes for home-produced services or for services delivered from the underground economy. A reduced effective tax rate in this area may be implemented through a tax credit for the purchase of household-related services, as currently practised in Sweden, or through a direct subsidy to maximise transparency.

In the field of excise taxation we do not find a case for significant changes in the level of the traditional "sin" taxes on tobacco and alcohol in Sweden. In particular, though recent research on optimal sin taxes in the presence of self-control problems could justify very high excises on tobacco and alcohol, the possibilities for Swedish consumers to engage in cross-border shopping leaves little scope for higher taxes on these products.

The other Swedish excises consist mainly of environmentally-related taxes. To implement the Swedish targets for reduction of greenhouse gas emissions in a cost-effective manner, we argue that the carbon tax on firms not covered by the EU Emissions Trading Scheme should in principle be uniform across industries if Sweden is committed to attaining her target for emission reductions regardless of the policies pursued by other countries. However, a

reduced tax rate for firms exposed to foreign competition may be warranted as a temporary policy if foreign governments can soon be expected to implement more ambitious climate policies, since there would then be a long-term basis for maintaining some carbon-intensive production on Swedish soil. For firms covered by the EU Emissions Trading Scheme we see little reason to maintain a Swedish carbon tax, since a price of carbon is already established in the European market for carbon allowances. Ideally, the carbon tax rate on the non-ETS sector should equal the average price of carbon emission permits to ensure a minimisation of the total cost of reducing Swedish CO2-emissions. If the resulting carbon tax rate is not sufficient to attain the target for Sweden's emission reductions, the Swedish government could make up for the balance by purchasing carbon emission permits and handing them in to the European Commission. If EU rules do not allow such a cost-effective way of curbing global greenhouse gas emissions, the cost of attaining the target for emissions reduction will be higher than necessary.

Our discussion of energy taxes suggests that energy taxes collected purely for revenue purposes should be levied only on households and should be concentrated on those energy products that are most inelastic in demand in order to minimise the deadweight loss. Energy taxes aimed at internalizing externalities should be levied on firms as well as households and should reflect the marginal social costs created by the externalities. A separate target for energy savings lacks an economic rationale, but if it is maintained, it calls for an additional "energy savings tax" levied on all firms and households in proportion to all of their energy use in whatever form. A separate target for the share of renewable energy surces in total energy use likewise lacks a clear rationale when externalities can be fully corrected through Pigovian taxes on carbon and energy. If such a target is nevertheless maintained, there is a case for reduced (possibly zero) energy tax rates on renewable energy sources.

In the area of road transport we suggest that (part of) the existing energy taxes on gasoline and diesel and (some of) the recurrent taxes on motor vehicles could be gradually replaced by road-pricing systems in relevant locations as the necessary technology matures and the costs of operating such systems fall. This would be a natural follow-up on the positive experience with the Stockholm congestion tax.

The final part of Chapter 5 discusses the popular double dividend hypothesis that a shift from other taxes towards green taxes will not only improve environmental quality but will also create a "second dividend" in the form of reduced tax distortions in the labour market. If true, this could motivate higher green taxes than would be warranted on purely environmental grounds. However, we saw that in general there will be no second dividend in the form of increased employment and non-environmental welfare, since a green tax reform just involves a shift from direct to indirect taxes on labour. A green tax reform will stimulate employment only if it succeeds in shifting the tax burden away from workers towards other groups, but such a shift can also be achieved through a general switch from direct to indirect taxation that does not involve higher green taxes. Green tax reforms should therefore be undertaken because they improve the environment and not in the expectation that they will yield significant non-environmental gains.

Chapter 6: The taxation of labour income

Chapter 6 discusses the optimal design of taxes on labour income when the government worries about economic efficiency (the total "size of the pie" available to society) as well as equity (the distribution of the pie). We identify a number of factors that should be taken into account if policy makers want to trade off the goal of equity against the goal of efficiency in a rational manner. These factors include the distribution of earnings capacities across taxpayers and the impact of taxation on the various margins of labour supply as well as society's valuation of income gains for the different income groups.

In particular, we note that the outcome of the optimal trade-off between equity and efficiency will depend very much on the way work efforts respond to a change in tax rates. If labour force participation is insensitive to economic incentives whereas the work efforts of those already employed is not, we find that the optimal tax-transfer system in an egalitarian society involves generous transfers to people outside the labour market combined with a rapid phase-out of transfers to low-income wage earners as they raise their labour income.

By contrast, if labour force participation responds significantly to the net income gain from employment whereas the effort of those already employed is not very sensitive to a lower tax on the last krona earned, it may be optimal to encourage labour force participation through an Earned Income Tax Credit (jobbskatteavdrag) even though the resulting revenue loss will require higher marginal tax rates than would otherwise be needed.

Given the considerable uncertainty regarding labour supply responses at the different margins as well as uncertainty regarding the distributional goals of policy makers, it is difficult to evaluate the social gain or loss from a reshuffling of the labour income tax burden across taxpayers. However, our analysis does suggest that even on rather conservative assumptions regarding behavioural responses, the very high marginal effective tax rate of about 75 percent at the upper end of the Swedish income distribution means that an abolition of the värnskatt imposed on high-income earners will more than fully pay for itself via the dynamic increase in the tax base. In such a situation there is no trade-off between equity and efficiency since the net revenue gain will enable the government to make everyone better off. Our analysis therefore leads us to suggest that the värnskatt be abolished.

Despite the uncertainty regarding the responsiveness of the tax base to a lower marginal tax rate, the risk involved in such a policy experiment is limited because of the relatively small revenue from the värnskatt. Moreover, in contrast to earlier findings, our analysis indicates that the degree of self-financing (*DSF*) in case of an abolition of the värnskatt would be higher than the *DSF* associated with an increase in the income threshold for the progressive central government income tax or an increase in the income level where social security benefits are capped.

Our description of current tax rules also shows that the Earned Income Tax Credit (jobbskatteavdraget) as well as the standard deduction (grundavdraget) vary with income in a complex manner which may be hard to grasp for the ordinary taxpayer. In particular, we note that the standard deduction reduces the base for calculating the EITC in a way that neutralizes the effect of the income-dependency of the standard deduction for wage earners. Hence the income-dependency of the standard decuction only matters for the average tax rate imposed on recipients of transfer incomes, since transfers affect the base for the calculation of the income-dependent standard deduction. The latter fact implies that

a change in the taxpayer's transfer income may influence the size of his EITC in a manner which may not be immediately clear to him. As a consequence of this complexity, the incentives embodied in the effective marginal tax rate schedule are probably hard for taxpayers to figure out, and hence they may not (fully) respond to these incentives in the way intended by policy makers. Since the effect of the standard deduction on the average and marginal tax rates of wage earners is fully offset by the way in which the EITC is designed, it seems desirable to simplify the personal labour income tax through a replacement of the current income-dependent standard deduction by an identical flat deduction for all taxpayers. The implications of this simplification for the distribution of income among transfer recipients may have to be countered through appropriate adjustments of the rates of transfer.

Chapter 7: The taxation of income from saving and investment

The way a country allocates its savings and investment can have important effects on its living standard. If the tax system causes capital to be channeled to low-productive uses, national income will be lower than it could have been. Chapter 7 identifies a number of tax distortions to the pattern of saving and investment in Sweden. The main distortions to the savings pattern stem from the lenient taxation of retirement saving and saving channelled into owner-occupied residential property. The tax subsidies to these forms of saving are estimated to generate a total deadweight loss of about 6½-10½ billion SEK measured in 2008 prices. The deferral of capital gains tax until the time of realization causes a further distortion by generating a tax preference for assets whose returns accrue mainly in the form of capital gain, and by hampering portfolio reallocation towards assets with a higher social (pre-tax) return.

On the investment side, the source-based business income tax (mainly the corporation tax) works like a combination of a labour income tax and a tax on capital input into domestic production. The corporation tax therefore tends to be more distortionary than the labour income tax. In addition, the taxation of business income distorts the choice between alternative forms of business organization, between debt and equity, and between short-lived and long-lived assets. We estimate that the combined deadweight

loss from the tax distortions to the choice of organizational form and to the debt-equity choice could amount to more than 32 billion SEK in 2008 prices; a huge distortion compared to the 83 billion SEK corporate tax revenue in that year.

To address the inefficiencies in the taxation of savings income, we propose the following reform measures:

- Tax all returns to financial saving (including the return to institutional saving) at a common rate of 25 percent.
- Replace the current municipal property tax, the current tax on realized capital gains on owner-occupied residential property and the stamp duties on transactions in such property by a flat property tax rate of 1 percent on a realistic assessment of the market value of the property.
- Tax all capital gains on listed shares on an accruals basis and tax the unrealized gains on unlisted shares resulting from the retention of corporate profits on a current basis, with an obligation for the company to pay the tax on the shareholder's behalf.

The replacement of the existing property taxes by the proposed 1 percent tax on residential property values will provide a roughly neutral tax treatment of financial savings and savings invested in owner-occupied housing, given a 25 percent capital income tax rate. The revenue gain from the first two measures above is estimated to be about 17 billion SEK (2008 level).

To reduce tax distortions to the level and pattern of business investment, we propose a business tax reform along the following lines:

- Introduce an Allowance for Corporate Equity (ACE) in the form of a deduction for an imputed normal return to equity.
- Reform the 3:12 rules to secure that any income up to a cap given by the normal return to business equity (the ACE) is taxed only once at the capital income tax rate, regardless of whether it is paid out (or realized as a capital gain) or not. Income above the normal return should be taxed as labour income when it is realized in the form of a dividend or a capital gain, with a credit for the corporation tax already paid.

- Liberalize the rules for offset of business losses, e.g. by allowing business losses to offset other tax liabilities for the same year such as VAT, Pay-As-You-Earn income tax and fringe benefits tax.
- Reduce the corporate income tax rate from the current 26.3 percent to 25 percent, corresponding to the proposed capital income tax rate.

Our analysis shows that the introduction of an ACE would in principle eliminate the tax distortion to the choice between debt and equity and among different business assets. It would also eliminate the tax distortion to the input choice between labour and capital in the small open Swedish economy. The proposed reform of the 3:12 rules would ensure a roughly identical tax treatment of closely held companies and proprietorships, thus eliminating the distortion to the choice between these two closely substitutable forms of business organization.

The revenue loss from an ACE allowance for corporate equity is estimated to be 8-9 billion SEK in 2008 prices, and the cut in the corporate tax rate from 26.3 to 25 percent is estimated to generate an additional revenue loss of about 4 billion SEK. According to our calculations, the total revenue loss from the corporate tax reform could easily be financed by the proposed changes in the taxation of savings income.

Summary of policy proposals

The analysis in this report indicates that, without eroding public revenue, the long run standard of living in Sweden could be raised through a comprehensive tax reform that reinstates and further develops the sound principles of tax neutrality and uniformity underlying the great tax reform of 1991. In particular, we propose a reform including the following elements:

Indirect taxation

- The VAT should be levied at the same rate on all goods and services. The uniform VAT rate could be set at a level generating the same net revenue as today. According to

prevailing estimates, it would only require a minor public expenditure to compensate vulnerable low-income groups for the rise in the VAT rate on foodstuffs.
- Energy taxes collected purely for revenue purposes should be levied only on households and should be concentrated on energy products that are most inelastic in demand. Energy taxes aimed at countering negative environmental effects should be levied on firms as well as households and should reflect the marginal social costs created by the negative externalities.
- The existing taxes on gasoline could be gradually replaced by road-pricing systems in relevant locations as the necessary technology matures and the costs of operating such systems decrease.

Taxation of labour income

- The värnskatt levied on top incomes should be abolished. Even on conservative assumptions regarding the taxpayers' behavioural responses to tax rates, the värnskatt is likely to cause a net loss of public revenue when its negative impact on the size of the tax base is accounted for.
- The current rules for the calculation of the Earned Income Tax Credit (jobbskatteavdraget) interact with the rules for the standard deduction (grundavdraget) in a very complex manner which is likely to weaken the positive incentive effects of the EITC. The rules could be simplified through a replacement of the current income-dependent standard deduction by an identical flat deduction for all taxpayers.

Taxation of income from saving and investment

- Align the tax rate on the (imputed) return to retirement saving (avkastningsskatten) with the ordinary personal capital income tax rate at a level of 25 percent.
- Replace the existing municipal property tax, the stamp duties and the existing capital gains tax on owner-occupied housing by a new 1 percent property tax on a realistic assessment of the property.

- Align the corporate income tax rate with the capital income tax rate at the level of 25 percent.
- Introduce an Allowance for Corporate Equity (ACE) in the form of a deduction for an imputed normal return to the equity of companies.
- Reform the 3:12 rules to secure that any income up to a cap given by the normal return to business equity (the ACE) is taxed only once at the capital income tax rate, and that income above that level is taxed in the same way as income from proprietorships.
- Liberalize the rules for offset of business losses.

Table 8.1 summarises our estimates of the effects of the main reform proposals on total tax revenue and on economic efficiency. The first column shows the so-called static revenue effects, defined as the effect on tax revenue in case taxpayers do not change their behaviour in response to the change in the tax rules. We see that in this case the reform proposals will be roughly revenue neutral, generating only a slight net revenue gain of about ½ billion SEK.

Columns 2 and 3 report the so-called dynamic revenue effects, that is, the effects on revenue caused by the changes in taxpayer behaviour triggered by the new tax rules. As we explain in the report, these dynamic revenue effects also reflect the effects of the tax changes on economic efficiency. For example, if a taxpayer responds to a lower tax rate by working more, the rise in tax revenue generated by his extra work effort implies a welfare gain for society, since it provides additional public funds that can be used for the benefit of all taxpayers (by contrast, the "dynamic" gain in the taxpayer's own after-tax income is not a net welfare gain since it just compensates him for his extra effort).

Column 2 in Table 8.1 shows the dynamic revenue gains arising from a move to uniform/neutral taxation in the various areas. The proposed property tax rate is chosen such that housing services will be taxed at roughly the same rate as all other goods and services. Further, as Chapter 7 explains, the introduction of an Allowance for Corporate Equity will mean that all corporate investments are taxed at the same effective marginal rate no matter whether they are financed by debt or equity, and regardless of the type of asset in which the company invests. Under the current discriminatory system of taxation, high-taxed activities must have a relatively high

value to be able to compete with low-taxed activities. A move to uniform taxation therefore means that consumers and firms substitute away from activities with a lower value towards activities with a higher value. As a consequence, the tax base expands, thereby generating the "dynamic" revenue gains indicated in column 2. The magnitude of these gains depends on the degree to which consumers are ready to change their pattern of consumption and the degree to which firms are willing to change their choice of production technologies and modes of investment finance in response to the changes in relative prices and costs caused by the tax changes. This responsiveness of taxpayer behaviour to changing relative prices and costs is captured by various so-called substitution elasticities which are subject to a great deal of uncertainty. The estimates in column 2 of Table 8.1 are based on substitution elasticities which are deemed to be plausible in the light of empirical economic research, but it must be stressed that the numbers are quite tentative, given the limited knowledge of their exact size.

With this important proviso, the second column in Table 8.1 indicates that the proposed moves towards uniform taxation would generate a total long-run revenue gain of more than 27 billion kronor as taxpayers adapt their behaviour to the new tax system. This revenue gain will accrue only gradually, since it will take some time for taxpayers to adjust their patterns of consumption, saving and investment. The uniform tax treatment of debt and equity ensured through an Allowance for Corporate Equity is seen to generate a dynamic revenue gain of more than 7 billion SEK as companies shift from debt-financed investments with a relatively low pre-tax rate of return to equity-financed investments with a higher pre-tax return. On top of this gain in public revenue, the higher average productivity of corporate investment ensured through the ACE also generates a more than 21 billion SEK increase in private after-tax incomes, so the total efficiency gain from a more productive allocation of the corporate capital stock is estimated to be roughly 27½ billion SEK.

Table 8.1 Effects of the main reform proposals on public revenue and economic efficiency (billion SEK, 2008 level)

Reform element	*1.Static revenue effect*	*Dynamic revenue effects (efficiency effects)*			*5. Total net effect on revenue*
		2. Effect of move to uniform taxation	*3.Effect of change in level of taxation*	*4.Total dynamic revenue effect*	
Move to uniform VAT	0	+9.4[2]	0	+9.4	+9.4
Abolition of värnskatt	-3.3[1]	0	+3.1[6,a] to +6.2[6,b]	+3.1 to +6.2	-0.2 to +2.9
Move to uniform 25% savings income tax	+3.0	+3.4[3]	-0.8[7,a] to -1.1[7,b]	+2.3 to +2.6	+5.3 to +5.6
Property tax reform	+13.8	+7.4[4]	-1.1[8,a] to -2.2[8,b]	+5.2 to +6.3	+19.0 to +20.1
Allowance for Corporate Equity	-9.0	+7.2[5]	+1.6[9,a] to +2.7[9,b]	+8.8 to +9.9	-0.2 to +0.9
Cut in corporate income tax rate to 25%	-4.0	0	+0.7[9,a] to +1.2[9,b]	+0.7 to +1.2	-3.3 to -2.8
Total effect	+0.5	+27.4	+3.5[a] to +6.8[b]	+30.9 to +34.2	+31.4 to +34.7

1. Revenue loss net of increase in consumption tax revenue. The gross revenue loss is 4.4 billion SEK.
2. Estimated from formula (B.4) in Chapter 5.
3. Estimated from formula (B.9) in Chapter 7.
4. Estimated from formulas (B.18) and (B.23) in Chapter 7.
5. Calculated as a 25% corporate tax rate times the aggregate productivity gain of 28.6 billion SEK estimated to follow from a neutral tax treatment of debt and equity (see Chapter 7).
6. Estimated from formula (B.13) in Chapter 6.
7. Calculated as the DSF for the savings income tax estimated in Chapter 4 multiplied by the static revenue effect in column 1.
8. Calculated as the DSF for the consumption tax estimated in Chapter 4 multiplied by the static revenue effect in column 1.
9. Calculated as the DSF for the business income tax estimated in Chapter 4 multiplied by the static revenue effect in column 1.
a. Assuming an elasticity of taxable income equal to 0.1.
b. Assuming an elasticity of taxable income equal to 0.2.
Source: Calculations by the author, based on the analysis in chapters 4 through 7.

Column 3 of Table 8.1 shows the estimated dynamic revenue effects occurring as taxpayers change their behaviour in response to the changes in the level of taxation stated in the first column in the table. The move to a uniform VAT does not generate any revenue effect of this kind since the new uniform VAT rate is chosen to ensure that the average *level* of value-added taxation is unchanged. In the other parts of the tax system the dynamic revenue effects of the change in the level of taxation depend on the elasticity of taxable income which measures the sensitivity of the tax base to a change in the effective marginal tax rate. This elasticity reflects all sorts of behavioural responses to taxation such as changes in labour supply, education and training, savings and investment as well as changes in tax planning activities and tax evasion etc. The smaller

numbers in column 3 are based on a conservative assumption that the elasticity of taxable income is only 0.1, meaning that a 1 percent increase in marginal after-tax income induces a 0.1 percent increase in the tax base.

However, the recent empirical studies reviewed in Chapter 4 suggest that a more realistic value of the elasticity of taxable income in Sweden would be 0.3 to 0.4. Nevertheless, in order not to err on the optimistic side, the larger numbers in column 3 of Table 8.1 assume an elasticity of taxable income equal to 0.2 which is still somewhat conservative in the light of recent empirical evidence for Sweden. In any case, we see that even with the low elasticity of 0.1, the dynamic net revenue gain from taxpayer responses to the changes in the level of taxation will be around 3½ billion kronor. The property tax reform will raise the price of housing services and will therefore work in part like a higher tax on consumption which erodes real wages, thereby discouraging labour supply. This is the reason for the estimated dynamic revenue loss from the property tax reform in the third column of Table 8.1. Note that this loss is smaller than the dynamic revenue gain from the move to a uniform taxation of housing and other forms of consumption (compare columns 2 and 3), so on balance the property tax reform improves economic efficiency. It might be thought that there is also a dynamic revenue loss from the fact that the higher property tax reduces the property tax base by weakening the incentive to invest in owner-occupied housing. However, this revenue loss is recouped through an increase in the revenue from the savings income tax, as taxpayers increase their financial saving at the expense of their housing investment. Since the effective tax rate on financial saving and housing investment is the same after the property tax reform, this change in the allocation of household wealth has no net impact on public revenue.

The fourth column in Table 8.1 simply adds up the dynamic revenue effects reported in columns 2 and 3. As already mentioned, this total dynamic revenue gain is an indicator of the gain in economic efficiency generated by the tax reform. We see that the total estimated gain amounts to more than 30 billion SEK, corresponding to roughly 1 percent of GDP. Even when we account for the considerable uncertainty regarding the various elasticities describing taxpayer behaviour, this estimate suggests that the proposed restructuring of the Swedish tax system would significantly improve the performance of the Swedish economy.

The fifth and final column in Table 8.1 adds the static and the dynamic revenue gains to obtain a measure of the total net revenue gain from the reform. The net revenue impact of the total reform package almost fully reflects the dynamic revenue gain which may be used in various ways. For example, the government could reduce public sector debt to improve the long-run sustainability of the public finances; it could increase the provision of public services or public transfer payments to selected groups, or it could reduce the level of taxation. If the latter route is chosen, it is of course important that taxes be cut in a way which does not compromise the principles of tax neutrality and uniformity that have generated the revenue gains in the first place. Since the dynamic revenue gains are of uncertain size and only materialize gradually over time, they should not be spent until they have actually accrued.

Are the efficiency gains obtained at the expense of equity?

It is natural to ask whether the large gains in economic efficiency reported in Table 8.1 can be reaped without creating a more unequal distribution of disposable incomes? In itself, the proposal to abolish the värnskatt clearly benefits the richest taxpayers who currently pay this tax. According to estimates by the Swedish Ministry of Finance, this part of the reform package would increase the average disposable income of the richest 10 percent of taxpayers by an amount of 5575 SEK per year (2010 level), while leaving the net incomes of other taxpayers unchanged. However, the analysis in Chapter 6 suggests that the dynamic revenue gain from an elimination of the värnskatt will almost certainly exceed the static revenue loss. In that case all taxpayers would benefit, even though the distribution of disposable incomes would become more unequal. To counter the tendency towards greater inequality, the government could choose to spend the net revenue gain in a way that favours low-income groups.

The third column of Table 8.2 below shows how the proposed cut in the ordinary capital income tax rate would affect average disposable income at various income levels. The table groups taxpayers into ten income groups (deciles) according to the size of their earned income (taxerad förvärvsinkomst = income from work + income from transfers). Income decile no. 1 includes the poorest 10 percent of all taxpayers while decile no. 10 encompasses

the richest 10 percent of taxpayers. We see from Table 8.2 that the cut in the capital income tax will have a very limited impact on disposable incomes. In percentage terms, the biggest changes in net incomes occur in the bottom and in the top decile. Taxpayers in the first decile include many pensioners with limited earned income but non-negligible capital income from savings accumulated during their working career. The high share of capital income in total income explains why taxpayers in this group experiences the largest percentage change in their average disposable income (0.75 percent). Taxpayers in the top decile for earned income are still active in the labour market but have typically been able to accumulate substantial wealth due to their high earned income. On average these taxpayers will experience a gain of 0.6 percent in their disposable income. For the other income groups, the cut in the capital income tax rate has a negligible impact on disposable income, since they typically have rather little net capital income, as their positive income from capital is more or less offset by their deductions for interest expenses.

Note that the numbers in Table 8.2 do not include the effect of the proposed rise in the tax rate on the (imputed) income from retirement saving (avkastningsskatten) from 15 to 25 percent. This element in the tax reform package will most likely have a progressive distributional impact, since low-income groups undertake very little saving for retirement to supplement their public pensions. Figure 8.1 illustrates the relationship between earned income and retirement savings in private individual accounts (thus the figure does not include occupational pension schemes mandated by collective bargaining agreements (tjänstepensioner)). The figure documents that individual retirement savings are made mainly by high-income earners.

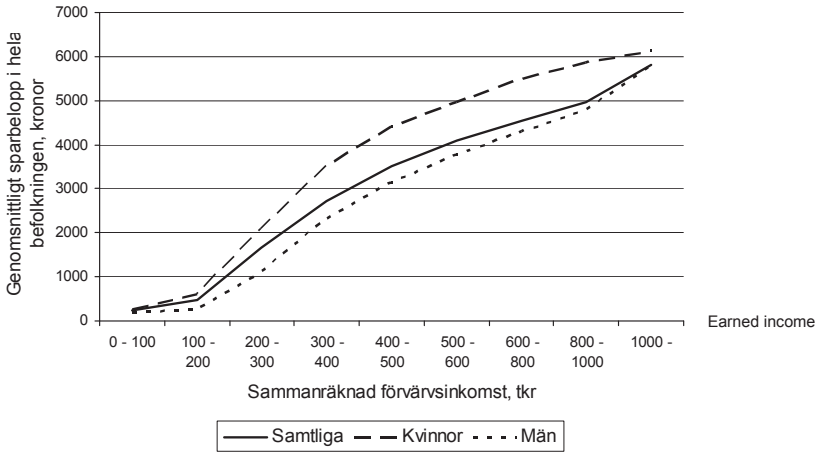
Table 8.2 Distributional effects of the proposed change in the capital income tax and in the property tax (2010 income levels)

Income decile	*Average earned income before tax*[1]	*Average individual disposable income*	*Change in individual disposable income*[2] *as a result of*	
			Cut in capital income tax from 30% to 25%	*Rise in property tax rate to 1%*[3]
1	24 309	67 081	500 (0.75%)	-655 (-0.98%)
2	98 764	107 879	356 (0.33%)	-503 (-0.47%)
3	141 439	133 625	551 (0.41%)	-893 (-0.67%)
4	178 338	153 765	293 (0.19%)	-1092 (-0.71%)
5	212 513	179 144	306 (0.17%)	-1592 (-0.89%)
6	246 216	206 959	207 (0.10%)	-1875 (-0.91%)
7	280 306	232 682	139 (0.06%)	-1925 (-0.83%)
8	320 125	264 526	175 (0.07%)	-2669 (-1.01%)
9	379 304	312 495	483 (0.15%)	-3852 (-1.23%)
10	620 204	487 182	2889 (0.59%)	-6979 (-1.43%)

[1] Average value of "taxerad förvärvsinkomst".
[2] The numbers without brackets are absolute changes measured in SEK; the numbers in brackets measure the percentage change in average individual disposable income.
[3] The property tax is assumed to be calculated as 1% of the fair market value which is equal to 4/3 of the current assessed property value (taxeringsvärdet). The numbers reflect the increased property tax on owner-occupied villas (småhus), excluding condominiums and farm houses.
Source: Calculations based on the FASIT model undertaken by the Ministry of Finance.

It should also be stressed that Table 8.2 does not include the effects of the proposed tightening of the taxation of capital gains on shares through the elimination of the deferral of tax until the time of realization of the gain. Capital gains on shares are an important part of total capital gains which are very unequally distributed across taxpayers. For example, in 2007 taxpayers with an earned income between 280,000 and 300,000 SEK scored an average net capital gain of around 17,400 SEK; taxpayers with earned incomes between 500,000 and 1,000,000 SEK obtained an average net capital gain of about 71,500 SEK, while those with earned incomes above 1,000,000 SEK benefited from an average net capital gain of 512,600 SEK (Tax Statistical Yearbook of Sweden 2009, p. 124). These numbers suggest that a tighter capital gains tax will be strongly progressive in its distributional impact, thus offsetting the distributional effect of the abolition of the värnskatt.

Figure 8.1 Distribution of retirement savings in individual savings accounts, 2008[1]



[1] Distribution across the whole population.
Source: Bergström et al. (2010, Figure 3.3)

Moreover, the last column of Table 8.2 shows that the proposed increase in the property tax rate to 1 percent of the current market value of the property will tend to imply a larger percentage fall in disposable income the higher taxpayer's earned income. An exception to this rule is the first decile which includes many retirees with a low earned income relative to the value of their property. However, for the bottom decile we see that the average absolute increase in the annual property tax burden is a relatively small amount of 655 kronor. For the average taxpayer in the first decile, this increase in the property tax burden is offset by a cut in the capital income tax bill of about 500 kronor. By contrast, for taxpayers in the upper income deciles we see from Table 8.2 that the rise in the property tax bill is considerably higher than the fall in the capital income tax bill.

Apart from the rise in the property tax rate, the proposed property tax reform includes an abolition of the stamp duties and capital gains taxes on transactions in owner-occupied housing, so the numbers in the last column of Table 8.2 overstate the increase in the net tax burden on home-owners. Overall, the numbers above indicate that the net effect on income distribution of the abolition

of the värnskatt and the changes in the various capital taxes will be quite small, since many of the effects tend to offset each other, and since the total amount of tax reshuffling is limited.

This conclusion is unlikely to change when we allow for the distributional effects of the proposed reform of corporate income taxation. One might think that the Allowance for Corporate Equity and the (small) cut in the corporate income tax rate to 25 percent will only benefit shareholders. However, in a small open economy like Sweden, a tax on the normal return to domestic corporate investment will tend to be fully shifted onto workers in the long run via a drop in investment which erodes real wages by reducing the productivity of labour (this point is explained in detail in chapters 4 and 7). By eliminating the tax on the normal return to corporate investment at the company level, the ACE eliminates this productivity-reducing effect of the corporation tax and paves the way for higher real wages. In the long run the distribution of the benefits from the ACE will therefore roughly coincide with the current distribution of labour income.

The modest cut in the corporate income tax rate will work as a combination of a cut in the tax on the normal return and a cut in the tax on "above-normal" profits on domestic investment. The first part of the tax cut works in the same way as the ACE and will thus benefit wage earners in the long run. The cut in the tax rate on above-normal profits will favour the owners of companies to a larger extent, but even this part of the tax cut will induce some increase in domestic investment so that part of the long-run benefit will be shared with domestic workers. In any case, the effects involved are small due to the small change in the corporate tax rate.

In the short run, the ACE and the cut in the corporate income tax rate will trigger some capital gain on shares that will redistribute income in favour of domestic shareholders. However, under the proposed capital gains tax reform these gains will be taxed immediately as they accrue, whereas the current capital gains tax regime allows deferral of tax until the time of realization.

When evaluating the distributional effects of the proposed tax reform, it is also important to keep in mind that the move towards greater uniformity and neutrality in taxation will ensure a broadening of the tax base that will allow the government to collect additional revenue at unchanged tax rates. If policy makers feel a need to compensate for some of the distributional effects of the tax changes, they can channel this additional revenue towards needy

groups through targeted transfers or tax cuts. More generally, a broad-based tax system collecting substantial revenues with a low loss of economic efficiency is the best safeguard of the welfare state arrangements that ensure an equitable distribution of income.

Appendix to chapter 6
The taxation of earned income in Sweden

Building on Sørensen (2008b, Appendix 3.1), this appendix explains the derivation of the effective marginal tax rates on labour income presented in Table 6.2 in Chapter 6. The tax rules described are those prevailing in Sweden in 2010. We employ the following

Notation
w = assessed personal labour income (taxerad arbetsinkomst)
G = standard deduction (grundavdrag)
E = earned income tax credit (jobskatteavdrag)
S = base for calculating the earned income tax credit (särskilt belopp)
τ^k = local government income tax rate
τ^{sb} = basic central government income tax rate
τ^{ss} = rate of central government surtax
T^P = personal labour income tax liability

The personal tax on labour income

To focus on the taxation of labour income, we consider a taxpayer with no income from other sources. Under current (2010) Swedish tax rules, the total personal income tax liability for a taxpayer with labour income above the standard deduction is given as follows:

$$T^P = \tau^k (w - G) - E \qquad \text{for} \qquad w \leq 384,600 \tag{A6.1}$$

$$T^P = \tau^k (w - G) + \tau^{sb} (w - 384,600) - E \qquad \text{for} \qquad 384,600 < w \leq 545,200 \tag{A6.2}$$

$$T^{P} = \tau^{k}\left(w-G\right)+\tau^{sb}\left(w-384,600\right)+\tau^{ss}\left(w-545,200\right)-E \quad \text{for} \quad w>545,200 \qquad \text{(A6.3)}$$

Equation (A6.1) describes the situation for a taxpayer with income below the level triggering central government income tax. Such a person only pays income tax to the local government. Equation (A6.2) gives the tax bill for a person who is only liable for the basic local government income tax, while (A6.3) states the tax liability for a person whose income exceeds the threshold for the central government surtax.

Both the standard deduction and the earned income tax credit depend on the level of labour income. Table A.6.1 shows the amount of standard deduction granted at various income levels for taxpayers below 65 years of age (rounded numbers):

Table A.1 The standard deduction (grundavdrag) at various income levels (2010)

Assessed income (taxerad inkomst (w))	Standard deduction (G)
0 – 42,000	18,000
42,000 – 115,400	18,000 + 0.2(w-42,000)
115,400 – 131,900	32,700
131,900 – 334,200	32,700 – 0.1(w-131,900)
334,200	12,500

Source: Beräkningskonventioner 2010. En rapport från Skatteekonomiska enheten på Finansdepartementet (Tabell 3.3, p. 57).

The table shows that the standard deduction increases with income in the interval between 42,000 kronor and 115,400 kronor whereas it falls with income in the interval from 131,900 kronor to 334,200 kronor. However, the resulting impact on the effective marginal tax rate is neutralized by the way in which the earned income tax credit is calculated. Specifically, the earned income tax credit is given as

$$E = \tau^{k}\left(S-G\right) \quad \text{for} \quad S \geq G$$
$$E = 0 \quad \text{for} \quad S < G \qquad \text{(A6.4)}$$

where the amount S (särskilt belopp) varies with labour income in the manner described in Table A.6.2:

Table A.2 The base amount for calculating the earned income tax credit (särskilt belopp, taxpayer below age 65, rounded numbers, 2010)

Assessed income (taxerad inkomst)	Särskilt belopp (S)
0 – 38,600	$S = w$
38,600 – 115,400	38,600 + 0.304(w-38,600)
115,400 – 296,800	62,000 + 0.095(w-115,400)
296,800	79,200

Source: Beräkningskonventioner 2010. En rapport från Skatteekonomiska enheten på Finansdepartementet (Tabell 3.7, p. 61).

Combining equations (A6.1) through (A6.4) with the information in Tables A.6.1 and A.6.2, one obtains the following expressions for the total personal labour income tax liability in the various income brackets:

$$0-38,600: \quad T^P = \tau^k\left(w-18,000\right)-\tau^k\left(w-18,000\right)=0$$

$$38,600-42,000: \quad T^P = \tau^k\left(w-18,000\right)-\tau^k\left[38,600+0.304\left(w-38,600\right)-18,000\right]$$
$$= \tau^k\left(1-0.304\right)\left(w-38,600\right)$$

$$42,000-115,400: \quad T^P = \tau^k\left[w-18,000-0.2\left(w-42,000\right)\right]$$
$$-\tau^k\left[38,600+0.304\left(w-38,600\right)-18,000-0.2\left(w-42,000\right)\right]$$
$$= \tau^k\left(1-0.304\right)\left(w-38,600\right)$$

$$115,400-131,900: \quad T^P = \tau^k\left(w-32,700\right)-\tau^k\left[62,000+0.095\left(w-115,400\right)-32,700\right]$$
$$= \tau^k\left(1-0.095\right)w-\tau^k 51,000$$

$$131,900-296,800: \quad T^P = \tau^k\left[w-32,700+0.1\left(w-131,900\right)\right]$$
$$-\tau^k\left[62,000+0.095\left(w-115,400\right)-32,700+0.1\left(w-131,900\right)\right]$$
$$= \tau^k\left(1-0.095\right)w-\tau^k 51,000$$

$$296,800-334,200: \quad T^P = \tau^k\left[w-32,700+0.1(w-131,900)\right]-\tau^k\left[79,200-32,700+0.1(w-131,900)\right]$$
$$= \tau^k(w-79,200)$$

$$334,200-384,600: \quad T^P = \tau^k(w-12,500)-\tau^k(79,200-12,500)$$
$$= \tau^k(w-79,200)$$

$$384,600-545,200: \quad T^P = \tau^k(w-12,500)+\tau^{sb}(w-384,600)-\tau^k(79,200-12,500)$$
$$= \tau^k(w-79,200)+\tau^{sb}(w-384,600)$$

$$545,200-: \quad T^P = \tau^k(w-12,500)+\tau^{sb}(w-384,600)+\tau^{ss}(w-545,200)-\tau^k(79,200-12,500)$$
$$= \tau^k(w-79,200)+\tau^{sb}(w-384,600)+\tau^{ss}(w-545,200)$$

The above equations define a continuous tax schedule with the effective marginal personal tax rates stated in Table A.6.3, where we have inserted the relevant values of the statutory tax rates prevailing in an average municipality in 2010 $(\tau^k = 0.315,\ \tau^{sb} = 0.2,\ \tau^{ss} = 0.05)$:[57]

Table A.3 Effective marginal personal tax rates, 2010

Assessed income	Marginal tax rate
0 – 38,600	0
38,600 – 115,400	$\tau^k(1-0.304)=0.219$
115,400 – 296,800	$\tau^k(1-0.095)=0.285$
296,800 – 384,600	$\tau^k=0.315$
384,600 – 545,200	$\tau^k+\tau^{sb}=0.515$
545,200 -	$\tau^k+\tau^{sb}+\tau^{ss}=0.565$

Source: Own calculations.

[57] Note that according to the above equations, the tax liability at the income level of 115,400 kronor may either be calculated as $T^P = \tau^k(1-0.304)(115,400-38,600)$ or as $T^P = \tau^k\left[(1-0.095)115,400-51,000\right]$. Except for a small inaccuracy due to our rounding of the numbers in the tax schedule, these two expressions imply the same tax bill, thus confirming that the tax schedule is indeed continuous at all income levels.

From Table A.6.3 one can calculate the marginal effective tax rates on gross labour income reported in Table 6.2, using the methods explained in the notes to that table and the assumptions on the tax component of social security components mentioned in section 6.1.

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- Regionalpolitiken - en ESO-rapport om tro och vetande.
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- Att reda sig själv - en ESO-rapport om rederier och subventioner.
- Bostad sökes - en ESO-rapport om de hemlösa i folkhemmet.
- Med backspegeln som kompass - om svensk musikexport 1974 – 1999.
- Med backspegeln som kompass - om stabiliseringspolitiken som läroprocess.

1998

- Staten och bolagskapitalet - om aktiv styrning av statliga bolag.
- Kommittéerna och bofinken - kan en kommitté se ut hur som helst?
- Regeringskansliet inför 2000-talet - rapport från ett ESO-seminarium.
- Att se till eller titta på - om tillsynen inom miljöområdet.
- Arbetsförmedlingarna - mål och drivkrafter.
- Kommuner Kan! Kanske! - om kommunal välfärd i framtiden.
- Vad kostar en ren? - en ekonomisk och politisk analys.

1997

- Fisk och Fusk - Mål, medel och makt i fiskeripolitiken.
- Ramar, regler, resultat - vem bestämmer över statens budget?
- Lönar sig arbete?
- Egenföretagande och manna från himlen.
- Jordbruksstödet - efter Sveriges EU-inträde.

1996

- Kommunerna och decentraliseringen - Tre fallstudier.
- Novemberrevolutionen - om rationalitet och makt i beslutet att avreglera kreditmarknaden 1985.
- Kan myndigheter utvärdera sig själva?
- Nästa steg i telepolitiken.
- Reglering som spel - Universiteten som förebild för offentliga sektorn?
- Hur effektivt är EU:s stöd till forskning och utveckling? - En principdiskussion.

1995

- Kapitalets rörlighet Den svenska skatte- och utgiftsstrukturen i ett integrerat Europa.
- Generationsräkenskaper.
- Invandring, sysselsättning och ekonomiska effekter.
- Hushållning med knappa naturresurser Exemplet sportfiske.

- Kostnader, produktivitet och måluppfyllelse för Sveriges Television AB.
- Vad blev det av de enskilda alternativen? En kartläggning av verksamheten inom skolan, vården och omsorgen.
- Hushållning med knappa naturresurser Exemplen allemansrätten, fjällen och skotertrafik i naturen.
- Företagsstödet Vad kostar det egentligen?
- Försvarets kostnader och produktivitet.

1994

- En effektiv försvarspolitik? Fredsvinst, beredskap och återtagning.
- Skatter och socialförsäkringar över livscykeln En simuleringsmodell.
- Nettokostnader för transfereringar i Sverige och några andra länder.
- Fördelningseffekter av offentliga tjänster.
- En Social Försäkring.
- Valfrihet inom skolan Konsekvenser för kostnader, resultat och segregation.
- Skolans kostnader, effektivitet och resultat En branschstudie.
- Bensinskatteförändringens effekter.
- Budgetunderskott och statsskuld Hur farliga är de?
- Den svenska insolvensrätten Några förslag till förbättringar inom konkurshanteringen m.m.
- Det offentliga stödet till partierna Inriktning och omfattning.
- Den offentliga sektorns produktivitetsutveckling 1980 – 1992.
- Kvalitet och produktivitet - Teori och metod för kvalitetsjusterande produktivitetsmått.
- Kvalitets- och produktivitetsutvecklingen i sjukvården 1960 – 1992.
- Varför kulturstöd? Ekonomisk teori och svensk verklighet.
- Att rädda liv Kostnader och effekter.

1993

- Idrott åt alla? Kartläggning och analys av idrottsstödet.

- Social Security in Sweden and Other European Countries Three Essays.
- Lönar sig förebyggande åtgärder? Exempel från hälso- och sjukvården och trafiken.
- Hur välja rätt investeringar i transportinfrastrukturen?
- Presstödets effekter en utvärdering.

1992

- Statsskulden och budgetprocessen.
- Press och ekonomisk politik tre fallstudier.
- Kommunerna som företagsägare - aktiv koncernledning i kommunal regi.
- Slutbudsmetoden ett sätt att lösa tvister på arbetsmarknaden utan konflikter.
- Hur bra är vi? Den svenska arbetskraftens kompetens i internationell belysning.
- Statliga bidrag motiv, kostnader, effekter?
- Vad vill vi med socialförsäkringarna?
- Fattigdomsfällor.
- Växthuseffekten slutsatser för jordbruks-, energi- och skattepolitiken.
- Frihandeln ett hot mot miljöpolitiken eller tvärtom?
- Skatteförmåner och särregler i inkomst- och mervärdesskatten.

1991

- SJ, Televerket och Posten bättre som bolag?
- Marginaleffekter och tröskeleffekter barnfamiljerna och barnomsorgen.
- Ostyriga projekt att styra stora kommunala satsningar.
- Prestationsbaserad ersättning i hälso- och sjukvården vad blir effekterna?
- Skogspolitik för ett nytt sekel.
- Det framtida pensionssystemet två alternativ.
- Vad kostar det? Prislista för statliga tjänster.
- Metoder i forskning om produktivitet och effektivitet med tillämpningar på offentlig sektor.
- Målstyrning och resultatuppföljning i offentlig förvaltning.

1990

- Läkemedelsförmånen.
- Sjukvårdskostnader i framtiden vad betyder åldersfaktorn?
- Statens dolda kapital. Aktivt ägande: exemplet Vattenfall.
- Skola? Förskola? Barnskola?
- Bostadskarriären som en förmögenhetsmaskin.

1989

- Arbetsmarknadsförsäkringar.
- Hur ska vi få råd att bli gamla?
- Kommunal förmögenhetsförvaltning i förändring – city-kommunerna Stockholm, Göteborg och Malmö.
- Bostadsstödet - alternativ och konsekvenser.
- Produktivitetsmätning av folkbibliotekens utlåningsverksamhet.
- Statsbidrag till kommuner: allt på en check eller lite av varje? En jämförelse mellan Norge och Sverige.
- Vad ska staten äga? De statliga företagen inför 90-talet.
- Beställare-utförare - ett alternativ till entreprenad i kommuner.
- Lönestrukturen och den "dubbla obalansen" - en empirisk studie av löneskillnader mellan privat och offentlig sektor.
- Hur man mäter sjukvård - exempel på kvalitet- och effektivitetsmätning.

1988

- Vad kan vi lära av grannen? Det svenska pensionssystemet i nordisk belysning.
- Kvalitet och kostnader i offentlig tjänsteproduktion.
- Alternativ i jordbrukspolitiken.
- Effektiv realkapitalanvändning i kommuner och landsting.
- Hur stor blev tvåprocentaren? Erfarenheten från en besparings-teknik.
- Subventioner i kritisk belysning.
- Prestationer och belöningar i offentlig sektor.
- Produktivitetsutveckling i kommunal barnomsorg.
- Från patriark till part - spelregler och lönepolitik för staten som arbetsgivare.
- Kvalitetsutveckling inom den kommunala barnomsorgen.

1987

- Integrering av sjukvård och sjukförsäkring.
- Produktkostnader för offentliga tjänster - med tillämpningar på kulturområdet.
- Kvalitetsutvecklingen inom den kommunala äldreomsorgen 1970-1980.
- Vägar ut ur jordbruksregleringen - några idéskisser.
- Att leva på avgifter - vad innebär en övergång till avgiftsfinansiering?

1986

- Offentliga utgifter och sysselsättning.
- Produktions-, kostnads-, och produktivitetsutveckling inom den offentliga finansierade utbildningssektorn 1960-1980.
- Socialbidrag. Bidragsmottagarna: antal och inkomster. Socialbidragen i bidragssystemet.
- Regler och teknisk utveckling.
- Kostnader och resultat i grundskolan - en jämförelse av kommuner.
- Offentliga tjänster - sökarljus mot produktivitet och användare.
- Svensk inkomstfördelning i internationell jämförelse.
- Byråkratiseringstendenser i Sverige.
- Effekter av statsbidrag till kommuner.
- Effektivare sjukvård genom bättre ekonomistyrning.
- Samhällsekonomiskt beslutsunderlag - en hjälp att fatta bättre beslut.
- Produktions-, kostnads- och produktivitetsutveckling inom armén och flygvapnet 1972-1982.

1985

- Egen regi eller entreprenad i kommunal verksamhet - möjligheter, problem och erfarenheter.
- Sociala avgifter - problem och möjligheter inom färdtjänst och hemtjänst.
- Skatter och arbetsutbud.
- Produktions-, kostnads- och produktivitetsutveckling inom vägsektorn.

- Organisationer på gränsen mellan privat och offentlig sektor – förstudie.
- Frivilligorganisationer alternativ till den offentliga sektorn?
- Transfereringar mellan den förvärvsarbetande och den äldre generationen.
- Produktions-, kostnads- och produktivitetsutveckling inom den sociala sektorn 1970-1980.
- Produktions-, kostnads- och produktivitetsutveckling inom offentligt bedriven hälso- och sjukvård 1960-1980.
- Statsskuldräntorna och ekonomin effekter på den samlade efterfrågan i samhället.

1984

- Återkommande kostnads- och prestationsjämförelser - en metod att främja effektivitet i offentlig tjänsteproduktion.
- Parlamentet och statsutgifterna hur finansmakten utövas i nio länder.
- Transfereringar och inkomstskatt samt hushållens materiella standard.
- Marginella expansionsstöd ekonomiska och administrativa effekter.
- Är subventioner effektiva?
- Konstitutionella begränsningar i riksdagens finansmakt - behov och tänkbara utformningar.
- Perspektiv på budgetunderskottet, del 4. Budgetunderskott, utlandsupplåning och framtida konsumtionsmöjligheter. Budgetunderskott, efterfrågan och inflation.
- Vem utnyttjar den offentliga sektorns tjänster.

1983

- Administrationskostnader för våra skatter.
- Fördelningseffekter av kommunal barnomsorg.
- Perspektiv på budgetunderskottet, del 3. Budgetunderskott, portföljeval och tillgångsmarknader. Modellsimuleringar av offentliga besparingar m.m.
- Produktivitet i privat och offentliga tandvård.
- Generellt statsbidrag till kommuner – modellskisser.

- Administrationskostnader för några transfereringar.
- Driver subventioner upp kostnader - prisbildningseffekter av statligt stöd.
- Minskad produktivitet i offentlig sektor - en studie av patent- och registreringsverket.
- Perspektiv på budgetunderskottet, del 2. Fördelningseffekter av budgetunderskott. Hushållsekonomi och budgetunderskott.
- Enhetligt barnstöd? några variationer på statligt ekonomiskt stöd till barnfamiljer.
- Staten och kommunernas expansion några olika styrmedel.

1982

- Ökad produktivitet i offentlig sektor - en studie av de allmänna domstolarna.
- Offentliga tjänster på fritids-, idrotts- och kulturområdena.
- Perspektiv på budgetunderskottet, del 1. Budgetunderskottens teori och politik. Statens budgetfinansiering och penningpolitiken.
- Inkomstomfördelningseffekter av livsmedelssubventioner.
- Perspektiv på besparingspolitiken.