

Intermediate service sector liberalization, and the GATS

Jukka Ruotinen

Helsinki School of Economics

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Abstract

In this paper, we are concerned with intermediate service sector liberalization and R&D spillover. Developing countries are in our special interest. The intermediate service producers provide services required to turn exports into imports. We are interested in the welfare effects of a government allowing a foreign producer to enter the domestic intermediate service sector, but still restricting its production by setting a welfare optimizing tax. Before the entering, the intermediate sector is dominated by a domestic producer. We will also study how the spillover from the skilled foreign producer affects the government's optimal behavior. Three cases, with different market power assumptions, are considered. If the service producers can both affect the world market price of the transported good, it is optimal for the government to allow competition. If the service producers can not affect the world market price, or if only the foreign producer can, the government's optimal decision is not as straightforward. Then the government's optimal behavior depends on how the world market price and the production cost of the transported good react to the increasing production, and how large the skill gap between the domestic and the foreign service producers is. The spillover increases the welfare of the domestic country.

1 Overview

The first multilateral trading system, General Agreement on Tariffs and Trade (GATT), came into effect in 1948. Traditionally only goods were covered in the trade negotiations. The Uruguay Round and the launch of the WTO changed this. The General Agreement on Trade in Services (GATS) came into force in 1995 including multilateral rules on international trade in services. The realized multilateral liberalization of trade in services has been very limited. In March 2003 the WTO members were supposed to leave initial offers of market access responding to the requests for access left in June 2002. During the year 2005 multilateral liberalization of trade in services should get properly started.

Despite the fact that multilateral liberalization of trade in services has been limited, trade in services has been increasing rapidly. The estimated value of the world trade increased from 3500 billion dollars to 6150 billion dollars between 1990-2001 (WTO 2002). During the same period the estimated value of trade in services increased from 826 billion dollars to 1460 billion dollars. The increase of trade in services has been highly due to increasing foreign direct investments (FDI). Considering the theoretical literature on international trade, goods and services have a lot in common. Still the local establishment (i.e. FDI) makes a difference between the two¹. While trade in goods means cross-border transactions, trade in services often requires a mix of cross-border transactions and local establishment. In addition to the GATT agreement that includes lowering trade restrictions, the GATS agreement includes also negotiations of investment rules when they limit market access in service sectors.

There are four different ways of providing an international service (four modes). One of the modes of the GATS agreement includes only cross-border transactions (cross-border supply). Three of the modes include trade that involves proximity (consumption abroad, presence of natural persons, and commercial presence). We are particularly interested in the last mode: commercial presence. It includes a foreign company setting up subsidiaries or branches to provide services in another country.

¹Francois (1990), Sampson and Snape (1985) and Francois (2000) examine the difference between trade in goods and trade in services

The importance of competition and effectiveness in the intermediate service sector is emphasized when we consider trade in goods. An inefficient service sector can make a significant barrier to trade in goods. One of the main targets of the GATS agreement is to increase the economic performance of the nations with an efficient service infrastructure. To get the intermediate service sector effective, increasing competition can be one solution for that. The lack of competition is especially the problem of developing countries, but competition rules are also needed in developed countries. This emphasizes the meaning of the GATS agreement, but stresses that the negotiations should take also into account issues that affect the degree of competition. Increasing competition can have significant welfare increasing effects on good producers and on consumers.

Traditionally marketing boards used to be quite common in developing countries. In some developing countries, they accounted for more than half of the value of a country's exports in some sectors². Nowadays marketing boards are rare, but state control in the intermediate sector still exists. This can be highly harmful especially for primary good producers in developing countries³. Even when the intermediate sector is not controlled by the government, problems still exists. In many developing countries the intermediate service sector is monopolized by private service producers (McCulloch, Winters and Cirera 2001). From the competition point of view the situation does not differ from the marketing board system. It is also problematic for the trade in goods, if there are too many layers of intermediaries⁴. Getting the intermediate service sector more efficient

²See Markusen (1982), Krishna and Thursby (1990) for detailed information about marketing boards and their welfare effects

³Jhabvala & Kanbur (2002) argues that the greatest failing in the successful forestry sector reform process in India is the continued state control and monopoly of the non-timber forest produce trade. Because of the inefficient state Forest Development Corporations, gum collector's margins are squeezed. Jhabvala & Kanbur (2002) also refers to Bajaj (2001) who argues that decontrolling the trade and reducing the government role in it is important

⁴Rodrik, McMillan & Welch (2002) analyses the cashew case in Mozambique. One the outcomes in the analysis is that positive outcomes from cashew trade liberalization were not reached because of the inefficient intermediate service sector in Mozambique. They argue that one of the main problem was, that there were too many layers of intermediaries that separated cashew farmers from the export trade, and therefore farmers did not gain from the liberalization

would have welfare increasing effects especially in the developing countries. Competition is needed, but increasing the skill level in the intermediate sector would be highly productive. R&D (Research and Development) spillovers would be one solution for building up an efficient intermediate service sector.

There are two types of positive R&D spillovers: rent spillovers and knowledge spillovers (Griliches 1992). Considering developing countries, R&D spillovers transfer more probably through knowledge spillovers, which mean that spillovers do not have to be bought. Mohnen (2001) divides the ways that international R&D spillovers can be transmitted into six groups. One of them is that R&D spillovers can be transmitted by FDI flows.

Coe, Helpman and Hoffmeister (1997) argue that the R&D spillovers from industrialized countries have boosted output in developing countries by about 21 billion dollars. As we mentioned before, FDI flows increased highly in the 1990's. The benefits from FDI flows for the receiving country are still unclear⁵. The welfare effects of FDI flows are problematic because it is hard to find a direct link showing that FDI flows lead to spillovers, which most certainly have positive welfare effects. If the link could be assured, then we should also be able to state that FDI flows lead to economic growth. Considering the GATS agreement it is specified in article XIX that developing countries can attach to their market opening commitments conditions that increase their participation in trade in services. One of these can be to assure transfer of technology⁶. This can also make the before-mentioned link between FDI flows and spillovers more probable.

2 Introduction

In the following model we are concerned with liberalization and the intermediate service sector. Francois and Wooton (2000a) have shown that increasing competition between

⁵Görg and Greenaway (2002) argue that empirical evidence does not show that developed countries would have gained from FDI flows. Carkovic and Levine (2002) argue that FDI flows have not been increasing growth in the developing countries under any circumstances (good education system, efficient financial system).

⁶Many developing countries have been getting benefit from using the advantage granted in article XIX (Business Guide to the world trading system 1999).

intermediate service producers has positive welfare effects on consumers of the transported product. We study more generally the welfare effects of increasing competition in the intermediate service sector. Most of all we are interested in how the total welfare of a country reacts if it allows a foreign service producer to enter the domestic market. The players of the model are a welfare maximizing government, domestic primary good producers, consumers in the world market, domestic intermediate service producer(s), and a foreign intermediate service producer⁷. We are also interested in the welfare effects of R&D spillovers from the foreign service producer to the domestic service producer and the people living in the domestic country.

The following assumptions are made in our model. First we assume a single primary good that is produced or gathered in the domestic country. The primary good is consumed domestically and transported by the intermediate service producers to be consumed abroad. We assume a single skilled foreign and a single low-skilled domestic intermediate service producer which buy the good from the domestic primary good producers and sell it abroad with the world market price. Because of liberalization of trade in services it is possible for the foreign service producer to join the domestic intermediate service sector. The service producers enter into Cournot competition. We have a one period model, where the domestic service producer is facing competition but also enjoying R&D spillover from the foreign service producer if the government allows competition. Spillovers require only the presence of the foreign service producer. The government is restricting the service production of the foreign producer by levying a welfare maximizing tax t_1 . The tax t_1 is assumed to limit the quantity of service produced by the foreign producer.

Three cases of competition between the domestic and the foreign service producers are considered and compared to the no competition case. In the first case (the market power case) the domestic and the foreign service producer are selling the primary good as a duopoly, so they have both market power on the world market price of the primary good. In the second case the service producers are taking the world market price of

⁷We assume that the domestic intermediate service producer is a marketing board or a private monopoly

the primary good as given (the non market power case). In the third case the domestic service producer takes the world market price as given, but the foreign service producer has market power (the mixed case). The last case is especially interesting considering developing countries. It is assumed in all cases, that there exists a export tax t_2 set by the domestic government on the transportation of the particular primary good.

3 The Model

3.1 Basic structure

First consider the domestic primary good producers⁸. We assume that the primary good producers are small and perfectly competitive. The net supply curve for the primary good (the share of the production that is not consumed domestically) is assumed to be linear in producer prices p_p :

$$p_p = a + b(q_d + q_f) \quad (1)$$

where q_d and q_f are the amounts of the primary good, that are transported by the domestic and the foreign intermediate service producers. We assume Cournot- competition, so the service producers are competing in the amount of primary goods q they transport from the domestic producers to the foreign consumers. The welfare of the domestic primary good producers is highly dependent on the service production of the service producers q_d and q_f , which are dependent on the consumption in the world market.

Consumers in the world market have a linear inverse-demand function for the primary good imported. The quantity of the primary good q consumed abroad depends on the price p_c they are charged with the equation:

$$p_c = c - d(q_d + q_f) \quad (2)$$

where again q_d and q_f are the amounts of the primary good transported. Comparing the supply curve and the demand curve we assume for further notice that $b > d$. This

⁸We are using similar formulas like Francois and Wooton (2000b) to illustrate that we are dealing with trade in services

means that the marginal cost of the primary good producers increases more sharply than the world market price decreases with increasing production of services⁹.

The margin paid for providing the service is σ :

$$\sigma = p_c - p_p \quad (3)$$

The total revenue of the service producers is σq_d and σq_f . The revenues of the service producers differ in the following cases because of the different marginal return functions. In the case that the service producer has market power on the world market price of the primary good its marginal return functions is:

$$MR_x = g - e(2q_x + q_y) \quad (4)$$

where x and y are the service producers considered and $g = c - a$ and $e = b + d$. When $x = d$ then $y = f$, and when $x = f$ then $y = d$. In the case the service producer cannot affect the world market price of the primary good its marginal return function is:

$$MR_x = g - (e + b)q_x - eq_y \quad (5)$$

The marginal cost functions for the domestic and the foreign service producers are assumed to be the same in all of the following cases. The marginal cost to the domestic service producer is:

$$MC_d = c_d - \gamma(c_d - c_f) + t_2 \quad (6)$$

The marginal production cost of the domestic service producer is c_d and of the foreign service producer c_f . It is assumed in the following analysis that $c_d > c_f$. The marginal production cost of the domestic service producer is higher than the marginal cost of the foreign service producer. This is because we assume that the foreign service producer is highly skilled. The marginal cost of the domestic service producer decreases because of the R&D spillover. The domestic service producer's learning process from the foreign

⁹We assume that there are also other exporters of the primary good in the world market than our two service producers. This is why the amount of primary good exported by the domestic and the foreign service producers do not affect the world market price as hard as they affect the marginal cost of the primary good producers.

service producer is assumed to be dependent on the amount of spillover rate γ that occurs. The amount of skills that the domestic service producer can learn is dependent on the difference between the marginal costs of the producers (the skill gap). The spillover rate is assumed to be $\gamma \in [0, 1]$.

We have assumed in equations 6 and 7 that the service producers have to pay an export tax t_2 for exporting the primary good to the world market. The export tax paid by the service producers is assumed to depend on the amount of production. The export tax rate is an exogenous factor and it can vary between $t_2 \in [0, 1]$.

The marginal cost of the foreign service producer is:

$$MC_f = c_f + t_1 + t_2 \quad (7)$$

where t_1 is the government welfare maximizing tax rate and t_2 the export tax rate. t_1 is also assumed to depend on the amount of production of the foreign service producer.

The profit functions of the service producers are:

$$\pi_d = (\sigma - (c_d - \gamma(c_d - c_f) + t_2))q_d \quad (8)$$

$$\pi_f = (\sigma - (c_f + t_1) + t_2)q_f \quad (9)$$

We assume that the domestic government knows the production functions of the service producers. The spillover rate γ is also assumed to be common knowledge. The domestic government is maximizing the total welfare of the domestic country by setting a welfare maximizing tax on the production of the foreign service producer t_1 . By assuming a linear utility function, government's welfare maximization problem is:

$$Max_{t_1} \left(\frac{b}{2} (q_d(t_1, t_2) + q_f(t_1, t_2))^2 + \pi_d(t_1, t_2) + t_1 q_f(t_1, t_2) + t_2 (q_d(t_1, t_2) + q_f(t_1, t_2)) \right) \quad (10)$$

The government maximization problem consists of several factors. Beginning from the left of equation (10), the first term is the primary producers' surplus. The primary producers' welfare is dependent on the total production of the service producers. It decreases when government increases a positive tax rate t_1 set on the production of the foreign service producer. The second term is the profit of the domestic service producer,

which increases when the tax decreases the competition between the service producers. The third and the fourth terms are the government tax incomes. The government benefits directly from the foreign service producer entering the domestic country and from the export tax t_2 paid by the service producers. The tax income from the export tax t_2 decreases when the tax rate t_1 increases, because increasing t_1 lowers the quantity produced by the service producers. The increase of the tax rate t_1 increases the welfare of the domestic country as long as it reaches the welfare maximizing point.

The R&D spillover increases the utility of the domestic country, because it increases the production of the domestic service producer. Naturally the profit of the domestic service producer also increases with higher spillover. The total quantity of the primary good demanded by the service producers increases with a higher level of spillover. This is why the primary good producers gain from the spillover. Also the government gains from spillover because the revenue from the export tax increases. The only factor that decreases when the spillover increases, is the tax revenue the government gains from the foreign service producer entering the domestic market.

3.2 The no competition case

In the first case the foreign service producer is not allowed to compete in the domestic market, and the domestic service producer is assumed to be a monopsony. The optimal amount of primary good transported by the domestic service producer is:

$$q_d^M = \frac{g - (c_d + t_2)}{2e} \quad (11)$$

$$q_d^{NM} = \frac{g - (c_d + t_2)}{e + b} \quad (12)$$

where q_d^M is the quantity of service produced by the domestic monopsony if we assume that it can affect the world market price of the primary good (market power) and q_d^{NM} if it can not (non market power)¹⁰. $g > (c_d + t_2)$ because otherwise it would not be profitable

¹⁰We could assume that there are n domestic intermediate service producers and this would lower their profit. If the n producers would all produce the same amount of q , as in all of the following cases, this would only divide the quantity produced by the one domestic service producer with n . This assumption would not change the optimal tax set on the foreign service producer or its optimal quantity of service

for the domestic service producer to transport the primary good. By comparing equations (11) and (12) we can see that the optimal production of the domestic service producer is higher when it is taking the world market price of the primary good as given.

The profit functions of the domestic service producer are:

$$\pi_d^M = e(q_d^M)^2 \quad (13)$$

$$\pi_d^{NM} = b(q_d^{NM})^2 \quad (14)$$

The profit of the domestic service producer is higher in the monopoly case. The welfare of the primary good producer (equation 10) is smaller when the service producer has market power.

3.3 The market power case

In the next case we assume that the domestic and the foreign service producers both can affect the world market price of the primary good. The marginal return of both service producers is introduced in equation 4. Combining these with the marginal cost functions (equations: 6,7), we get the production functions of the service producers:

$$q_d = \frac{g - 2(c_d + t_2) + (c_f + t_1 + t_2) + 2\gamma(c_d - c_f)}{3e} \quad (15)$$

$$q_f = \frac{g + (c_d + t_2) - 2(c_f + t_1 + t_2) - \gamma(c_d - c_f)}{3e} \quad (16)$$

From the government maximization problem (equation 10) we get the welfare optimizing tax t_1 :

$$t_1 = \frac{(5e - 2b)g - (e - b)c_d - (4e - b)c_f + (e - b)\gamma(c_d - c_f) - (8e - 2b)t_2}{10e - b} \quad (17)$$

We know from the previous assumptions that $g > (c_d + t_2) > (c_f + t_2)$. It follows that $t_1 > 0$, if the export tax t_2 is not too high. With high values of the export tax t_2 it can be optimal for the government to set a negative tax t_1 . When the tax rate t_1 is positive we know that the quantity of the primary good transported by the domestic service producer increases when the tax rate increases. To see that it is profitable for the

produced.

foreign service producer to enter the domestic market and that competition exists, we have to check the amount of service produced by the foreign service producer:

$$q_f = \frac{3bg + (12e - 3b)c_d - 12ec_f - (12e - 3b)\gamma(c_d - c_f) + (6e - 3b)t_2}{3e(10e - b)} \quad (18)$$

We can see that the amount of production by the foreign service producer is positive. The spillover decreases the amount of production by the foreign service producer. We know from equation 18 that it is profitable for the foreign service producer to pay the government its welfare maximizing tax t_1 , and compete in the domestic market. We also know that the domestic country welfare increases with increasing competition in the intermediate service sector.

3.4 The non market power case

In the non market power case the home and the foreign service producers take the world market price p_c of the primary good as given. The marginal return functions of both service producers are introduced in equation 5. Combining these with the marginal cost functions (equations: 6,7), we get the production functions of the service producers:

$$q_d = \frac{bg - (e + b)(c_d + t_2) + e(c_f + t_1 + t_2) + (e + b)\gamma(c_d - c_f)}{b(2e + b)} \quad (19)$$

$$q_f = \frac{bg + e(c_d + t_2) - (e + b)(c_f + t_1 + t_2) - e\gamma(c_d - c_f)}{b(2e + b)} \quad (20)$$

Again from the government optimization problem (equation 10) we get the welfare optimizing tax:

$$t_1 = \frac{(4eb - b^2)g - (eb - b^2)c_d - 3ebc_f + (eb - b^2)\gamma(c_d - c_f) - (6eb)t_2}{2e^2 + 6eb + b^2} \quad (21)$$

It can be seen again that $t_1 > 0$, if the export tax t_2 is not too high. With high values of the export tax t_2 it can be optimal for the government to set a negative tax t_1 . The amount of service produced by the foreign service producer in the non-duopoly case is:

$$q_f = \frac{(3eb^2 - 2e^2b + 2b^3)g + (2e^3 + 7e^2b + eb^2 - b^3)c_d - (2e^3 + 5e^2b + 4eb^2 + b^3)c_f}{b(2e + b)(2e^2 + 6eb + b^2)} - \frac{(2e^3 + 7e^2b + eb^2 - b^3)\gamma(c_d - c_f) + (4e^2b - b^3)t_2}{b(2e + b)(2e^2 + 6eb + b^2)} \quad (22)$$

Because we assumed in chapter 3.1 that $b > d$ we know that the amount produced by the foreign service producer is positive. With this assumption it is profitable for the foreign service producer to compete with the domestic producer. It is also optimal for the government to allow competition in the intermediate service sector in the non market power case. Now assume that $d > b$. When $d > b$ and the skill gap $c_d - c_f$ and the export tax rate t_2 are small, the production of the foreign service producer can decrease to zero. Now the tax rate that turns the production of the foreign service producer into zero is smaller than the country welfare maximizing tax rate. Because the welfare of the country increases when the tax rate increases to its welfare maximizing point, it is optimal for the government not to allow competition in the intermediate service sector. Still when our assumption that $b > d$ holds, it is optimal for the domestic country to let the foreign service producer compete with the domestic producer. Also when the skill gap $c_d - c_f$ or the export tax rate t_2 are high, it can be optimal for the foreign service producer to enter the domestic market.

3.5 The mixed market power case

In the mixed market power case we assume that the domestic service producer can not affect the world market price of the primary good but the foreign service producer can. This case is relevant especially when developing countries are considered. From equation 5 we can get the marginal return function for the domestic service producer and from equation 4 for the foreign producer. Combining these with the marginal cost functions (equations 6,7), we can get the following production functions for the service producers:

$$q_d = \frac{bg - (e + b)(c_d + t_2) + e(c_f + t_1 + t_2) + (e + b)\gamma(c_d - c_f)}{b(2e + b)} \quad (23)$$

$$q_f = \frac{bg + e(c_d + t_2) - (e + b)(c_f + t_1 + t_2) - e\gamma(c_d - c_f)}{b(2e + b)} \quad (24)$$

From the government maximization problem (equation 10) we get the welfare maximizing tax:

$$t_1 = \frac{(3e^2b + eb^2 - b^3)g + (e^3 - 2e^2b + eb^2)c_d - (e^3 + e^2b + 2eb^2 - b^3)c_f}{2e^3 + 4e^2b + 4eb^2 - b^3} - \frac{(e^3 - 2e^2b + eb^2)\gamma(c_d - c_f) - (4e^2b + 3eb^2 - b^3)t_2}{2e^3 + 4e^2b + 4eb^2 - b^3} \quad (25)$$

As in the previous competition cases, the tax rate t_1 is positive when the export tax t_2 is not too high. The amount of primary good transported by the foreign service producer is in the mixed market power case:

$$q_f = \frac{b(4eb^2 - e^3)g + (e^4 + 5e^3b + 5e^2b^2 - 2eb^3)c_d - (e^4 + 4e^3b + 5e^2b^2 + 2eb^3)c_f}{e(e + 2b)(2e^3 + 4e^2b + 4eb^2 - b^3)} - \frac{-(e^4 + 5e^3b + 5e^2b^2 - 2eb^3)\gamma(c_d - c_f) + (2e^3b + 3e^2b^2 - 2eb^3)t_2}{e(e + 2b)(2e^3 + 4e^2b + 4eb^2 - b^3)} \quad (26)$$

The argumentation goes as in the non market power case. With the assumption that $b > d$ the amount of transported goods by the foreign service producer is propably positive. Only if the skill gap $c_d - c_f$ or the export tax t_2 are high, it can be the case that the foreign service producer is not entering the domestic market. When our assumption does not hold, so that $d > b$, and the skill gap $c_d - c_f$ and the export tax rate t_2 are small, the production of the foreign service producer lowers to zero. Still again with the assumption that $b > d$ we know that the amount of service produced by the foreign producer is positive. This means that also in the mixed market power case it is profitable for a welfare maximizing government to allow competition in the intermediate service sector.

3.6 Welfare implications

In the following we analyze the welfare effects of increasing competition in the domestic service sector on different players in our model. We compare the welfare effects in the market power and in the non market power case, and study in which case the profit or loss of a player is highest¹¹. We compare the welfare effects with different values of b (marginal cost of primary good) and d (world market price reaction to increasing production). We consider also the spillover effects. g is assumed to be large and the export tax t_2 small.

We consider first the welfare effect of increasing competition on the primary good

¹¹Because of the welfare effects are similar in the non market power case and in the mixed case market power case we compare only the first two cases.

producers. The increase of the welfare is in the market power case:

$$\frac{b}{2}((q_d^M(t_1, t_2) + q_f^M(t_1, t_2))^2 - (q_d^M)^2) \quad (27)$$

where $q_d^M(t_1, t_2)$ is the amount of production of the domestic service producer when competition exists, $q_f^M(t_1, t_2)$ is the amount produced by the foreign producer and q_d^M is the amount of production without competition. In the non market power case equation 27 is different only because of the different amounts of production¹². The welfare of the primary good producers increases more in the market power case. This is because before there is competition, the difference between the primary good producers' surplus is lower if the service producer has market power. A high spillover increases the primary good producers' welfare more in the non market power case.

The profit functions of the domestic service producers without competition are illustrated in equations (13) and (14). The quantity of service produced by the domestic producer decreases when competition increases. From this we know that also the profit of the domestic service producer decreases. The equations for the two cases are:

$$e((q_d^M) - (q_{di}^M(t_1, t_2))) \quad (28)$$

$$b((q_d^{NM}) - (q_{di}^{NM}(t_1, t_2))) \quad (29)$$

where equation (28) is the decrease of welfare in the market power case and equation (29) in the non market power case. We can get the quantities of production as before. When d is small the domestic service producer's profit decreases more if it does not have market power. If b and d are close or b is small the producer's profit decreases more in the market power case. A high spillover increases the profit of the domestic service producer more if the service producers do not have market power.

The government benefits directly from the increasing competition through the tax income. With small values of d the tax income is higher in the non market power case. The tax rates (t_1) are close in both cases but the quantity of foreign service production is higher in the non market power case. With close values of b and d or small values of b the case is just the reverse. The tax rate t_1 and the quantity of foreign service production are higher in the market power case. The spillover enlarges the gap.

¹²The quantity equations are taken from chapters 3.3 and 3.4.

4 Conclusions

We have shown with the model that a government can increase the welfare of the country by liberalization of the intermediate service sector. This can hold also true irrespective of the market power of the intermediate service producers. Even when there is no R&D spillover, increasing competition in the intermediate service sector can increase the welfare of the domestic country. If R&D spillover occurs, the total welfare of the domestic country increases even more. The welfare of the domestic primary good producers increases when the foreign service producer enters the domestic market. This occurs because the total amount of service production increases when there is competition. The spillover increases the total service production even more. The spillover increases also the profit of the domestic service producer, and that way compensates its losses from the increasing competition. The domestic government benefits from increasing competition through increasing tax income.

One critical assumption that we have made in the model is that the marginal cost of the primary good producers increases more sharply than the world market price decreases with increasing production. When this assumption holds, it is optimal for the domestic government to liberalize its intermediate service sector independent of the market power of the intermediate service producers. The tax rate t_1 set by the government is the highest in the market power case and second highest in the mixed market power case. If the previous assumption does not hold, and if the skill gap between the domestic and the foreign service producer is small, then competition in the intermediate service sector occurs only in the market power case. In the non market power case and in the mixed market power case it is optimal for the government to set the tax rate so high that competition does not take place.

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