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**Learning about tax evasion and tax avoidance  
through collaboration with tax authorities**

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# Agenda

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- A.** The big questions in tax compliance and tax enforcement?
- B.** Why collaboration btw. researchers and tax authorities?
- C.** Lessons from collaboration in Denmark
  - Large tax compliance experiment
  - Detection of intertemporal shifting in wage income
  - Introduction of information reporting on donations to charity
  - Introduction of interest payments on owed taxes
- D.** Recent plans to extend the collaboration in Denmark

## **A. The big questions?**

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- **How big a problem is tax noncompliance (evasion, avoidance, errors)?**
- **Why do people comply or not comply?**
- **What are the optimal tax enforcement strategies to reduce noncompliance?**
- **How many resources should society devote to tax enforcement?**

## A. Economic theory of tax compliance

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**In traditional theory (A-S-model), tax compliance depends on**

- Economic gain of not complying
- Probability of being detected
- Costs of being detected
- Risk aversion

Andreoni et al (1998): “the most significant discrepancy that has been documented between the standard economic model and real-world compliance is that the theoretical model greatly overpredicts noncompliance.”

### **Extensions**

- Behavioral aspects: social norms, tax morale, guilt, shame, etc.  
**[Taxpayers are able but unwilling to cheat]**
- Information aspects: third-party reporting, withholding, etc.  
**[Taxpayers are willing but unable to cheat]**

## A. Empirical measurement is difficult

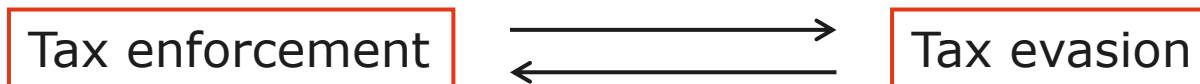
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### Measurement problems

- Not possible to measure noncompliance directly in standard register data
- People don't tell the truth, even in anonymous surveys (and large samples of individuals are too expensive)

### Identification problems

- A relationship between resources used on tax enforcement and degree of tax evasion may not be casual



## **B. Why collaboration btw. researchers and tax authorities?**

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### **Researcher perspective**

- Access to much better data
- Possible to make policy interventions/experiments
- Access to “insider knowledge” about specific rules, nature of noncompliance...

### **Tax authority perspective**

- High-quality evaluations + more credible evaluations (better quality + researcher independency)
- More stimulating work environment for high-skilled employees

### **Potential problems**

- Practical: Costly + very confidential data
- Differences in aim/focus
- Mistrust + results may become in conflict with some “policy agenda”

## C. The Danish tax compliance experiment

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Tax audit experiment carried out in Denmark in 2007-08 with more than 40,000 individual income tax filers



“Unwilling or Unable to Cheat? Evidence from a Tax Audit Experiment in Denmark.” Kleven, Knudsen, Kreiner, Pedersen & Saez, *Econometrica*, 2011

“Tax Payer Compliance.” *Report of the Danish Tax Agency (SKAT)*, 2009

“Tax evasion and the administration of the Danish Tax System” Chapter 4 in the *Report of the Danish Economic Council*, 2011

“What makes tax payers comply? Lessons from a tax audit experiment in Denmark.” Kreiner, *European Economy Papers* 463. European Commission, 2012

## C. Experimental Design

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A stratified random sample of about 20,000 individuals were selected for tax audits in 2007 [**100% audit group**]

Audits: not pre-announced, did not use audit flags, very rigorous

⇒ Data from audited and filed tax returns used to analyze overall level of compliance, type of income, effect of the marginal tax rate, best predictors of evasion...

Randomly selected **0% audit group** + randomly selected **audit-threat letter group** in 2008

⇒ Effects of tax enforcement (audit correction and audit probability) on future reporting behavior



## C. Detectable tax evasion in Denmark

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		Total audit adjustment	Under-reporting	Over-reporting
<b>Net income</b>	Amount	<b>2,2%</b>	<b>2,3%</b>	<b>-0,1%</b>
	Individuals	<b>10,7%</b>	<b>8,6%</b>	<b>2,2%</b>
<b>Total tax</b>	Amount	<b>2,8%</b>	<b>3,0%</b>	<b>-0,1%</b>
	Individuals	<b>10,6%</b>	<b>8,4%</b>	<b>2,2%</b>

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## C. Income types, 3rd party information and tax evasion

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	Share of total net income (%)	Evasion rate(%)
Total net income	100	2,3
Personal income	102	1,1
Deductions	-4	2,2
Capital income	-5	2,6
Stock income	3	5,0
Self-employment income	5	15,7
Third-party reported income	95	0,3
Self-reported income	5	41,5

### C. Probability of underreporting: Social, economic and information factors

	Social factors		Socio-economic factors		Information factors		All factors	
Constant	<b>12.72</b>	(1.06)	<b>10.13</b>	(1.12)	<b>1.18</b>	(0.25)	<b>3.72</b>	(1.01)
Female	<b>-5.56</b>	(0.63)	<b>-4.17</b>	(0.65)			<b>-2.06</b>	(0.62)
Married	1.22	(0.70)	-0.55	(0.72)			<b>-1.50</b>	(0.72)
Member of church	-1.59	(0.98)	<b>-2.27</b>	(0.97)			-0.94	(0.92)
Copenhagen	-1.49	(1.52)	-0.01	(1.51)			-0.25	(1.47)
Age above 45	-0.72	(0.67)	-0.63	(0.67)			-0.56	(0.61)
Home owner			<b>5.49</b>	(0.65)			0.15	(0.66)
Firm size below 10			<b>5.07</b>	(1.26)			<b>3.47</b>	(1.05)
Informal sector			<b>4.37</b>	(1.15)			0.27	(0.92)
Self-Reported Income					<b>5.58</b>	(0.75)	<b>5.59</b>	(0.80)
Self-Reported Income > 20K					<b>21.68</b>	(1.38)	<b>21.09</b>	(1.40)
Self-Reported < -10K					<b>14.99</b>	(1.42)	<b>14.74</b>	(1.42)
Audit Flag					<b>13.22</b>	(1.58)	<b>13.07</b>	(1.53)
R-square	1.2%		2.5%		16.2%		16.5%	
Adjusted R-square	1.1%		2.4%		16.1%		16.5%	

## C. Effects of tax enforcement on evasion

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### Change in reported net income 2007-2008 due to audit correction in 2007

	Audit correction in 2007	Difference: 100% vs. 0% control group			IV-effect of correction
	Net income	Net income	Self- reported	Third-party reported	Net income
<b>Amount (DKK)</b>	<b>8491</b>	<b>2557</b>	<b>2331</b>	<b>225</b>	<b>0,301</b>

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1 EURO = 7.5 DKK

## C. Conclusions

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**Tax gap reasonably low** ( $\approx 2-3\%$ ) in relation to standard theory and e.g. US...

... **because it is "difficult to evade"** (under reporting of 42% on self-reported income and 0,3% out of 3rd party reported income)

... **because of extensive use of 3rd party information** from employees, banks, trade unions etc. (95% of net income)

**Socio economic factors have little predictive power** compared to variables reflecting existence and size of income that is difficult to detect  $\Rightarrow$  **"go after the money"**

**Positive effect from tax rate to tax evasion** (bunching evidence)

**Tax enforcement has positive behavioral effects** (audit adjustment raises self-reported income by 30% of the original adjustment the year after)

### C. Cost-benefit analysis of current audit strategy

	All	Self-employed	Wage Earners	Wage earners: Flag	Wage earners No flag
<b>Population share</b>	----- Percent -----				
	100	8	92	11	80
<b>Revenue</b>	----- 2009-DKK -----				
Mechanical	1.150	9.100	400	2.250	100
Behavior	600	3.450	350	2.350	50
Audit cost	1.900	14.600	700	700	700
<b>Net effect</b>	<b>-150</b>	<b>-2.050</b>	<b>50</b>	<b>3.900</b>	<b>-550</b>

## C. Lessons for tax administration

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### **Third-party information**

Very effective instrument to reduce underreporting

Direct consequence of study: Introduction of full 3<sup>rd</sup>-party reporting on stocks (buying/selling prices + dividends)

Difficult to expand third-party info much more in Denmark... Self-employment income is a challenge

### **Optimal audit strategy**

Audit selection criteria: Should focus on income information variables. Socio-economic factors do not improve selection significantly

High evasion rate on self-employment income, but self-employed are also very expensive to audit

Current level of audit resources in Denmark not far away from the revenue-maximizing level

## Detection of intertemporal income shifting

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New data source with monthly payroll records for all Danish employees  
+ tax reform reducing highest marginal tax rate from 63% to 56%  
⇒ enable convincing identification of intertemporal shifting behavior

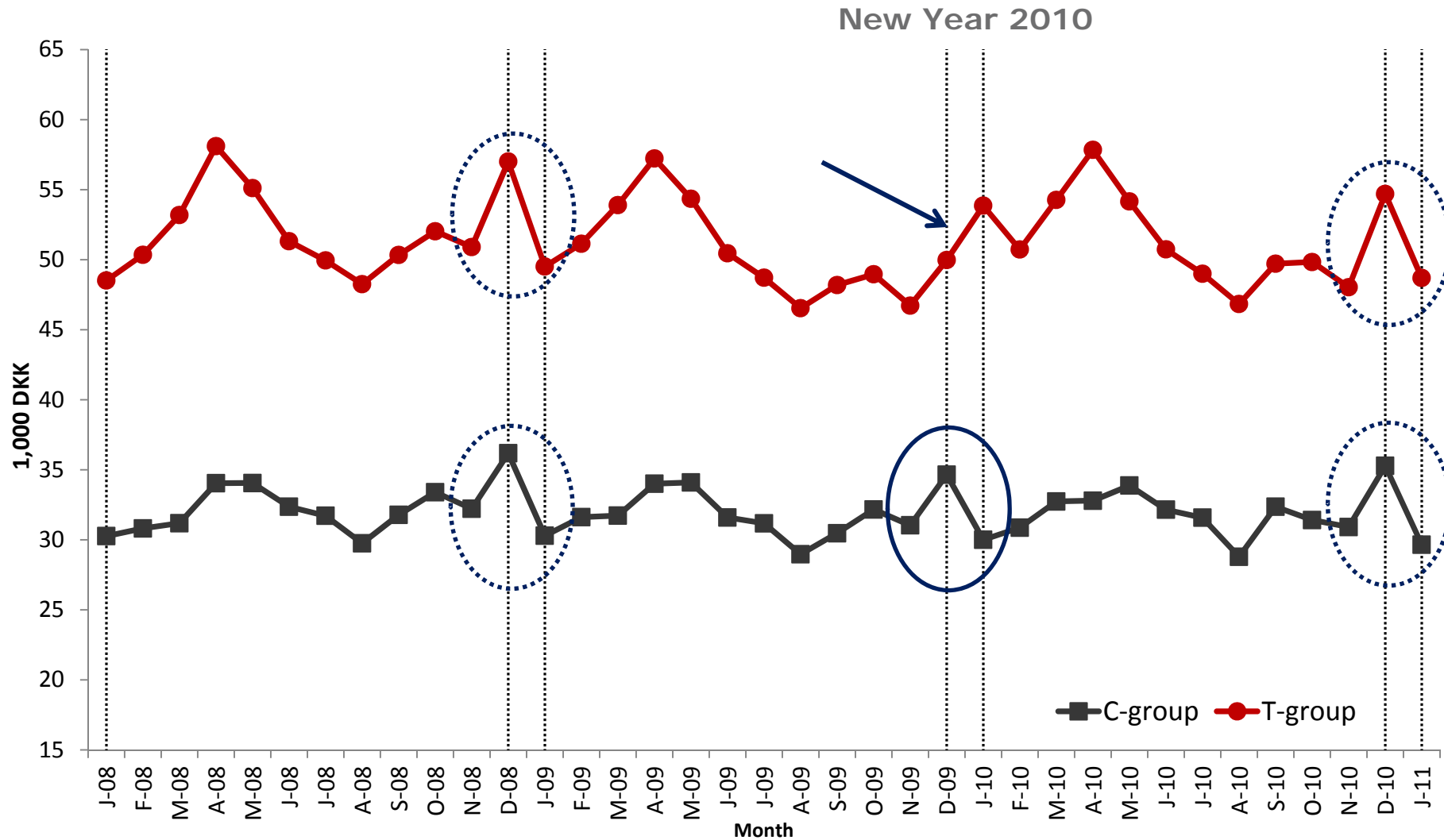


“Year-End Tax Planning of Top Management: Evidence from High-Frequency Payroll Data.” Kreiner, Leth-Petersen and Skov, *American Economic Review*, Papers and Proceedings, 2014

“Tax Reforms and Intertemporal Shifting of Wage Income: Evidence from Danish Monthly Payroll Records.” (with Søren Leth-Petersen and Peer Ebbesen Skov). Working paper, January 2015. Revise-and-resubmit at *American Economic Journal: Economic Policy*



# Intertemporal income shifting visible in raw data



## Identifying taxpayers shifting monthly wages

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Shifting Indicator Dummy  $D_{y,m} = 1$  IFF

- $(w_{y,m} - w_{2008,m})/w_{2008} > 50\%$

**AND**

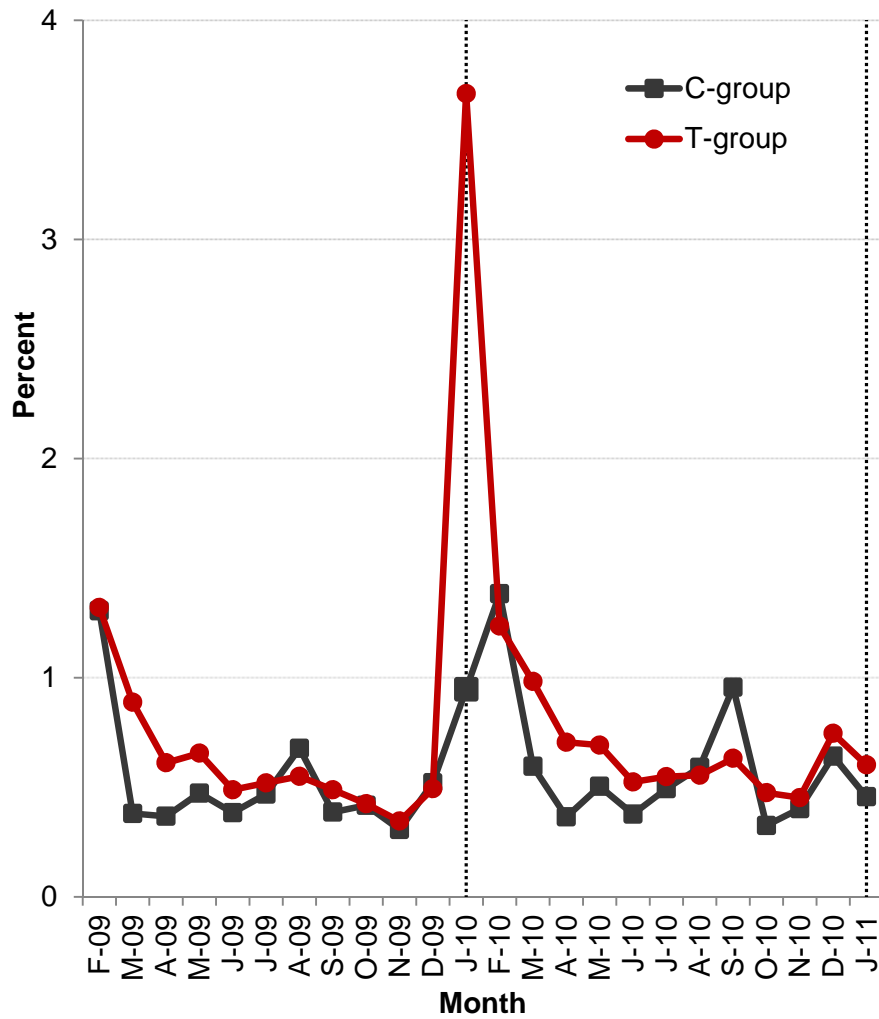
- $-(w_{y,m-1} - w_{2008,m-1})/w_{2008} > 50\%$

Captures both

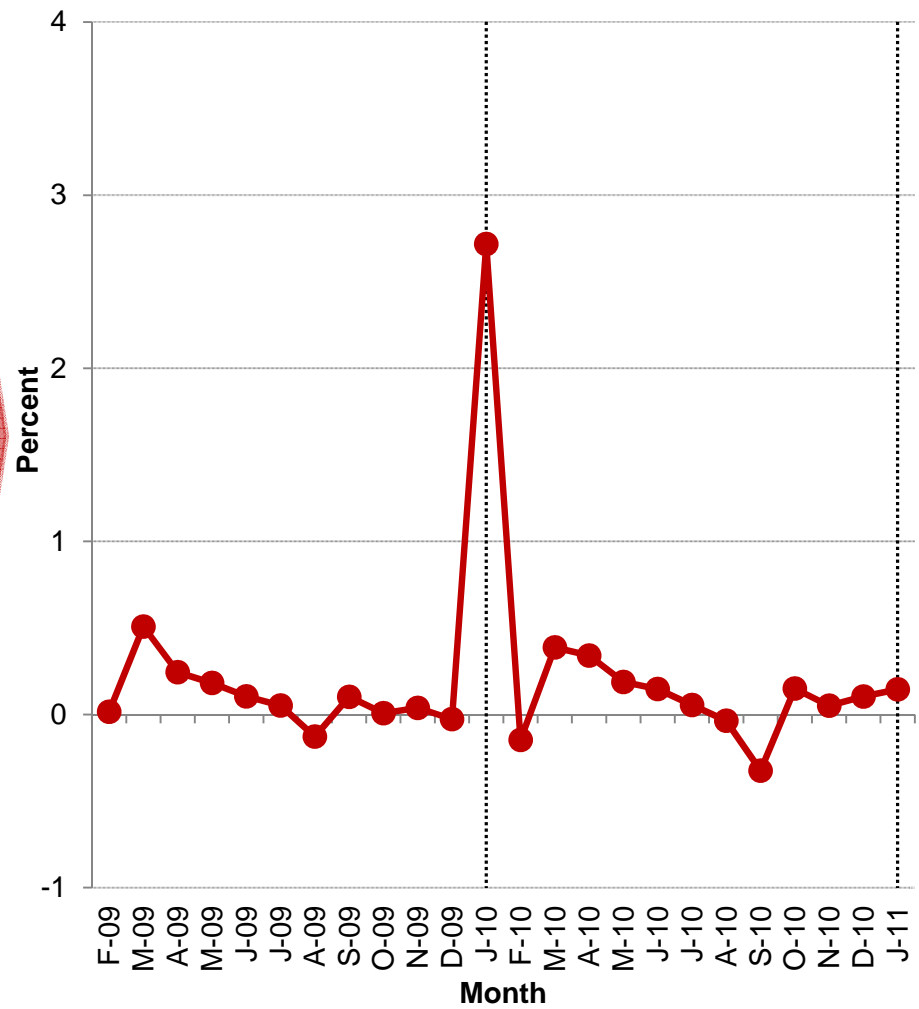
- Individuals who normally receive a **year-end bonus** but postpone the Dec09 bonus payment to Jan10
- Individuals who defer payment of **regular wage income** from Dec09 to Jan10

# Identifying taxpayers shifting monthly wages

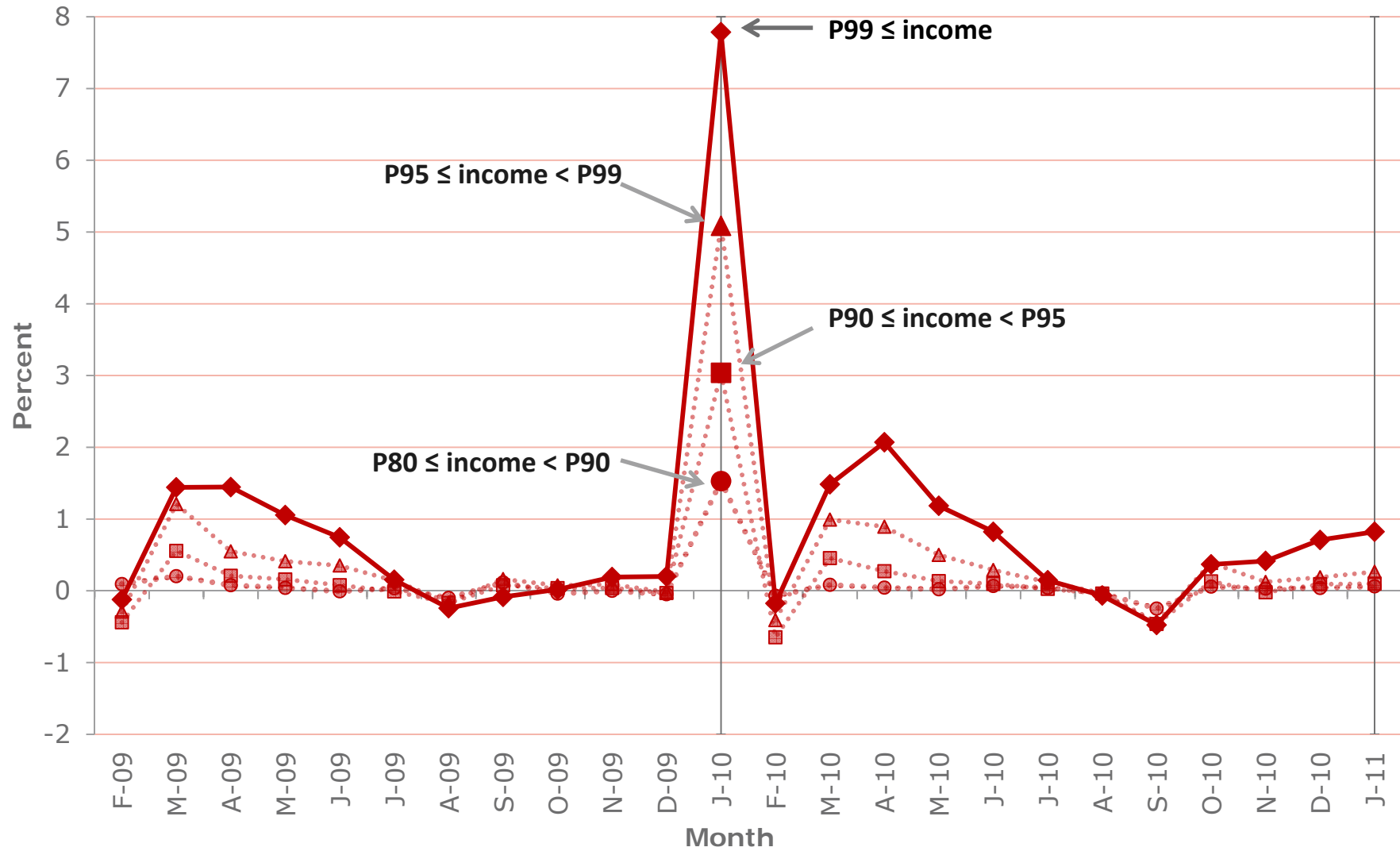
Shifting indicator across treatment status



Shifting indicator of T-group minus C-group



# Shifting is increasing in income



## Elasticity of taxable income (ETI): Temporary versus permanent component

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### Importance of shifting for diff-in-diff estimates of the ETI

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Income group	All months (1)	Excl. N09, D09 & J10 (4)
Full sample	0.10 [0.08;0.11]	0.01 [-0.00;0.03]
income $\leq$ P80	0.02 [-0.01;0.04]	-0.01 [-0.03;0.02]
P80 $\leq$ income < P90	0.06 [0.05;0.08]	0.01 [-0.00;0.03]
P90 $\leq$ income < P95	0.12 [0.11;0.14]	0.04 [0.02;0.06]
P95 $\leq$ income < P99	0.16 [0.14;0.18]	0.01 [-0.01;0.03]
P99 $\leq$ income	0.26 [0.21;0.31]	-0.06 [-0.12;-0.01]

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## Main conclusions

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**Large shifting responses:** around 10% of monthly income was shifted from 2009 to 2010 in the T-group

**Widespread:** takes place at all income levels & extent of shifting is similar across industry sectors

**Concentrated:** few individuals ( $\approx 3\%$ ) who shift large amounts

**ETI bias:** May account for all the income variation used to estimate the short run ETI + May account for the common finding of a higher ETI for high-income individuals

**Why do only few taxpayers exploit the opportunity?**

- Awareness (less than one out of five)
- Liquidity constraints (liquid assets/income significant)
- Limited willingness of employers to collaborate (more shifting in small private firms and among CEO's, no shifting in public sector)

## Introduction of third-party reporting on charitable giving

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Introduction of third-party reporting and pre-population of charitable tax deductions in 2008  $\Rightarrow$  effect on tax compliance

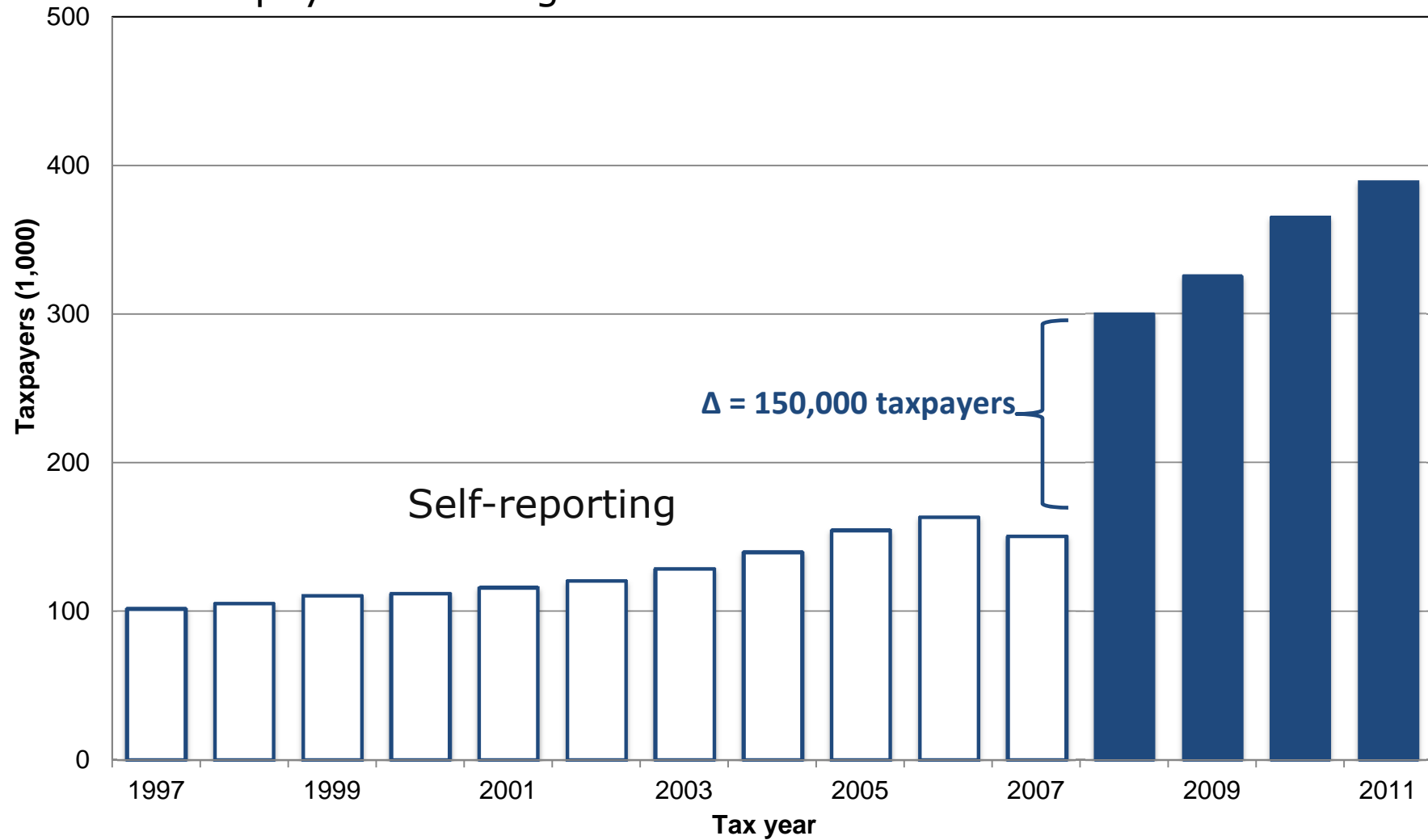


Evidence on Unclaimed Charitable Contributions from the Introduction of Third-Party Information Reporting in Denmark, Gillitzer and Skov, Working paper 2014

# Introduction of 3-party reporting caused a surge in deductions

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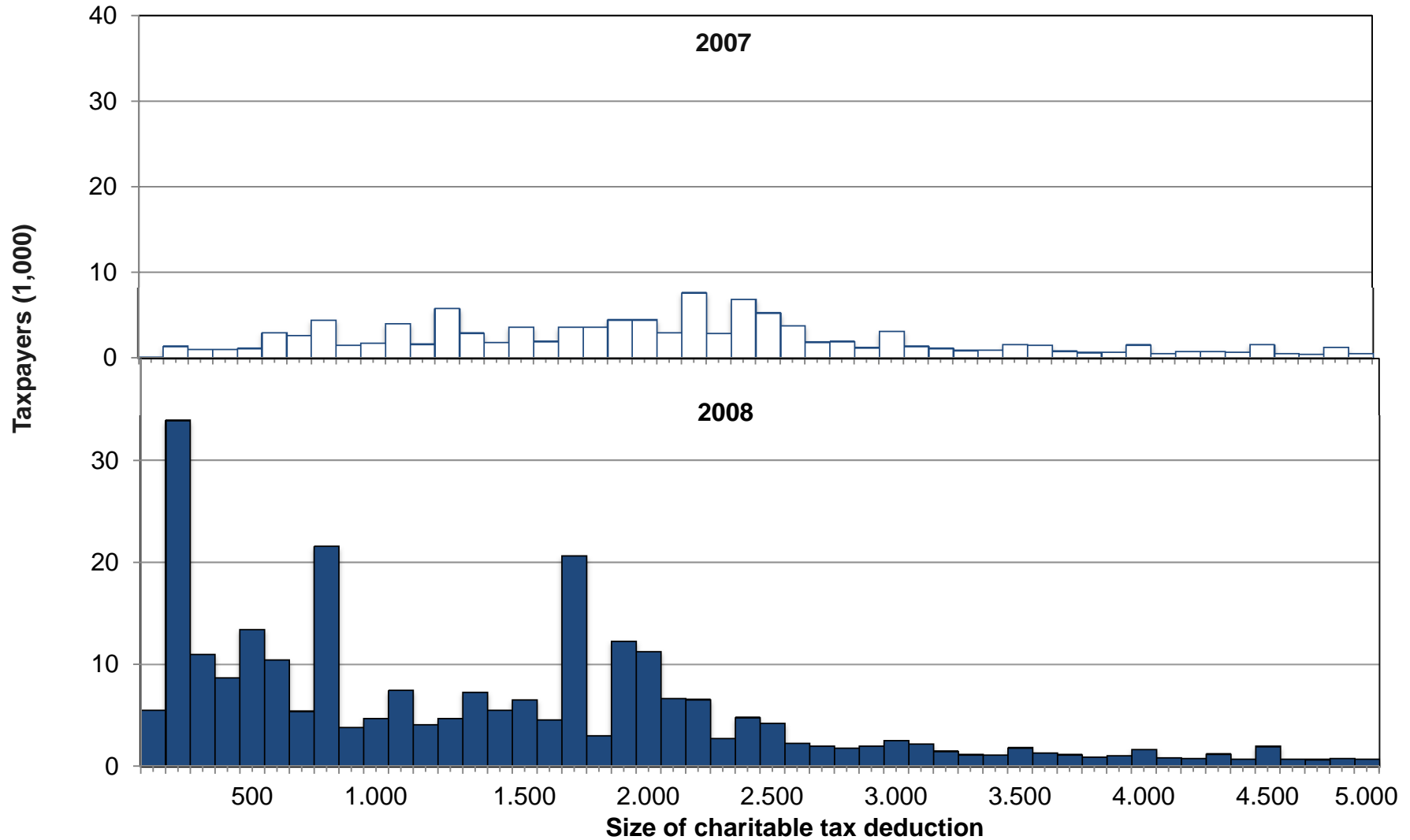
## Taxpayers claiming a tax deduction for charitable donations





## Most new claims were small in value

Taxpayers claiming a charitable tax deduction: by claim size



## Introduction of interest payments on owed taxes

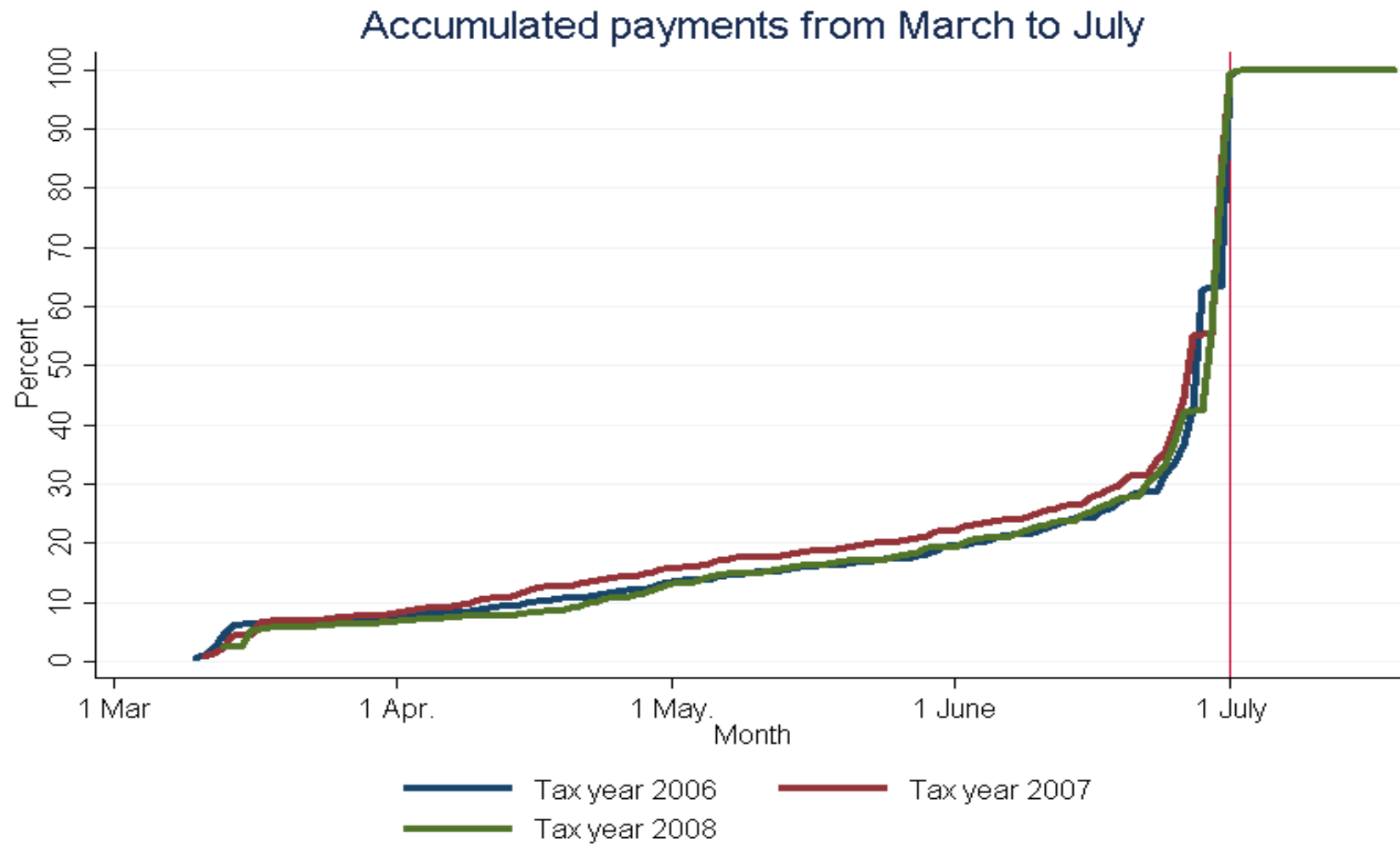
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2010 tax reform introduced an interest rate of 4.6% on owed taxes accruing from January 1st 2010 (until 2010 owed taxes paid before July 1st would avoid any interest payments)



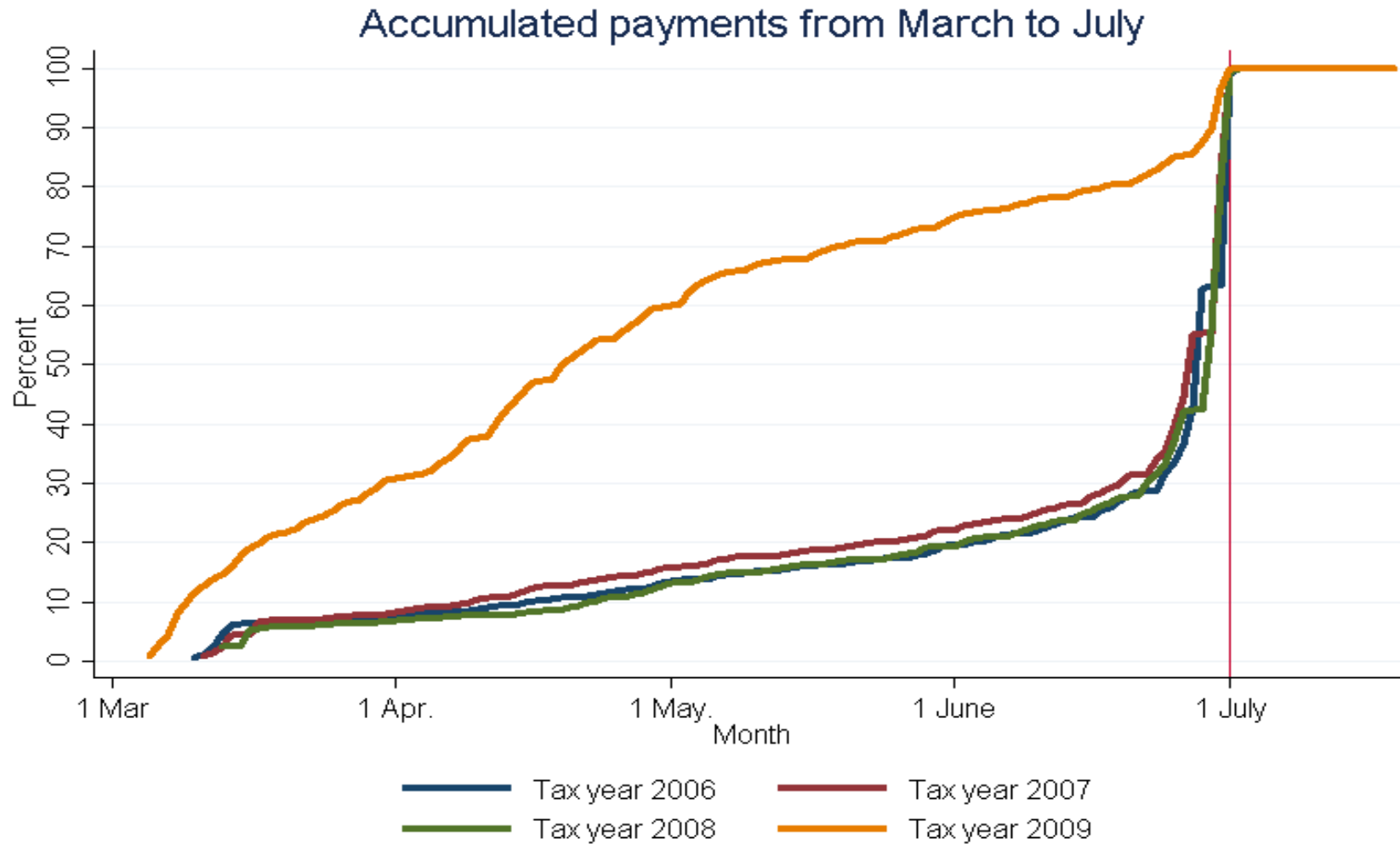
“Pay now or pay later: Danish Evidence on Owed Taxes and the Impact of Small Penalties.” Skov, Working paper, 2014

## Pre-reform: bulk of owed amounts paid close to the July deadline



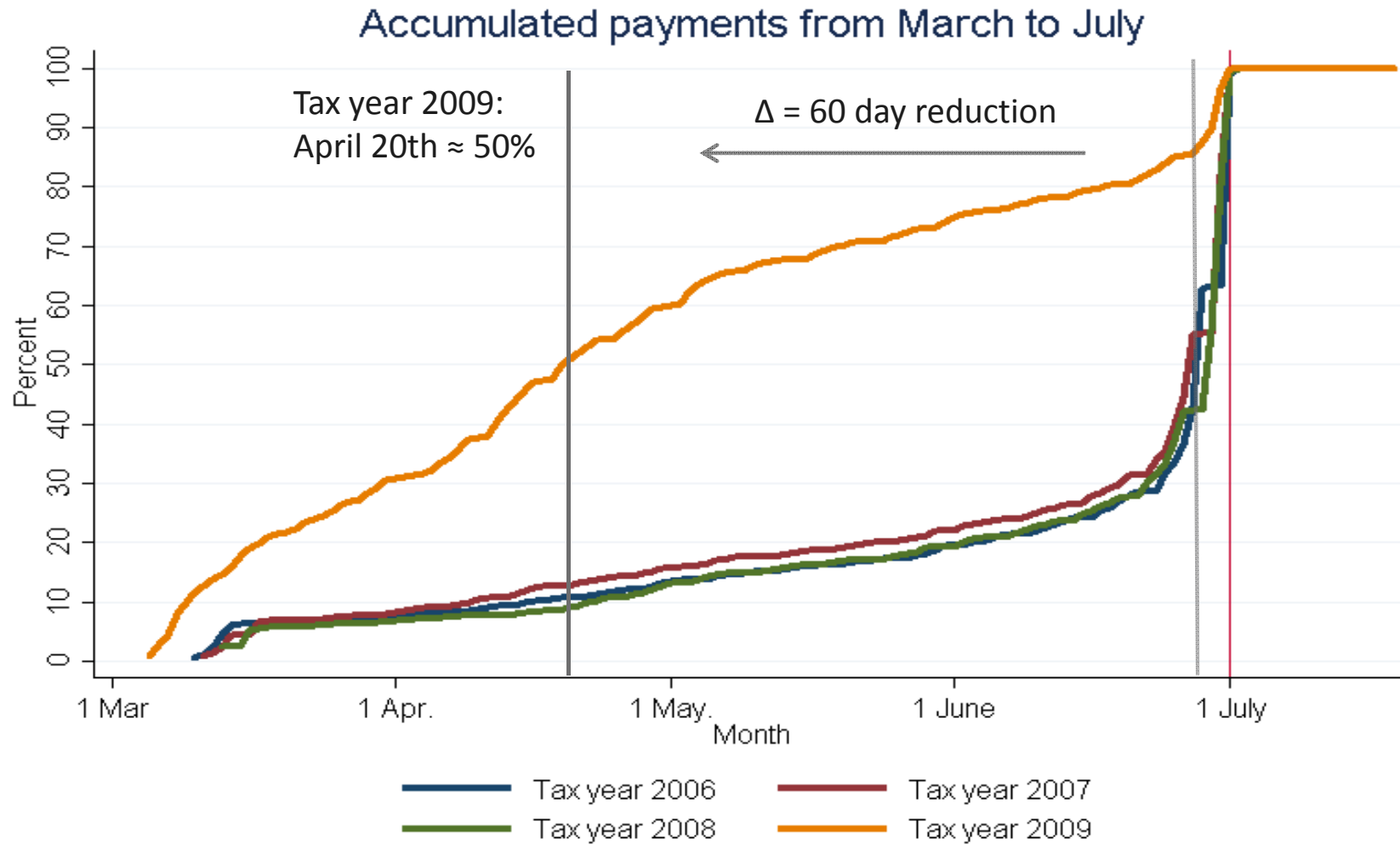
The figure shows the accumulated payments from the arrival of the pre-populated tax assesment in the beginning of March to end of the voluntary payment period, 1st July

## Substantial change in payment profile after reform



The figure shows the accumulated payments from the arrival of the pre-populated tax assesment in the beginning of March to end of the voluntary payment period, 1st July

## Substantial change in payment profile after reform



The figure shows the accumulated payments from the arrival of the pre-populated tax assesment in the beginning of March to end of the voluntary payment period, 1st July

## Future collaboration in Denmark

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Many recent examples of successful collaborations with tax authorities

- Pomeranz (2014), *American Economic Review* (forthcoming), Role of 3<sup>rd</sup> party info for VAT enforcement, large-scale experiment together with the Chilean tax adm.
- List et al. (2014), NBER WP, Social norms and public good messages to enhance tax compliance, large-scale experiment together with the UK tax adm.
- Slemrod et al. (2015), 3<sup>rd</sup> party info from PayPal and others on sales of self-employed, data from US tax adm.

Next step in Denmark (hopefully)

- 2-3 master students sitting in the Ministry of Taxation or the Danish Tax Agency doing their master thesis on tax data
- 2 PhD students financed by the Ministry of Taxation
- Formalized network: Researchers, Ministry of Taxation, Danish Tax Agency...

Thank you!

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It's hard to be self-employed!