

# Primary inequality and redistribution through employer Social Security contributions: France 1976-2010

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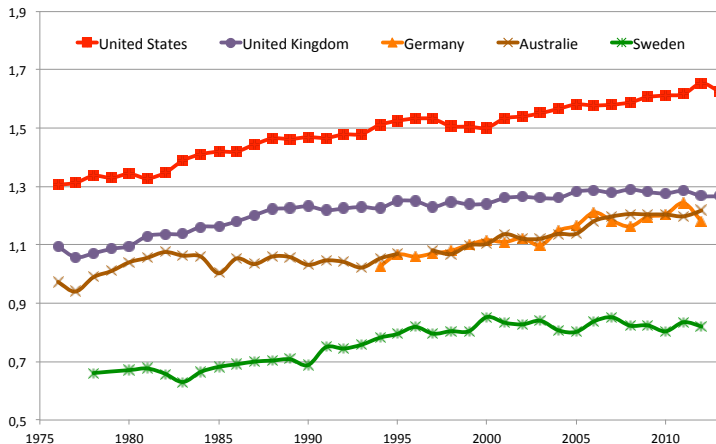
<sup>3</sup>PSE

INSEE, 13th April 2018

# Motivation

## Increase in wage inequalities in developed countries

Figure 1: Wage inequality (P90/P10 log gross wage ratio)

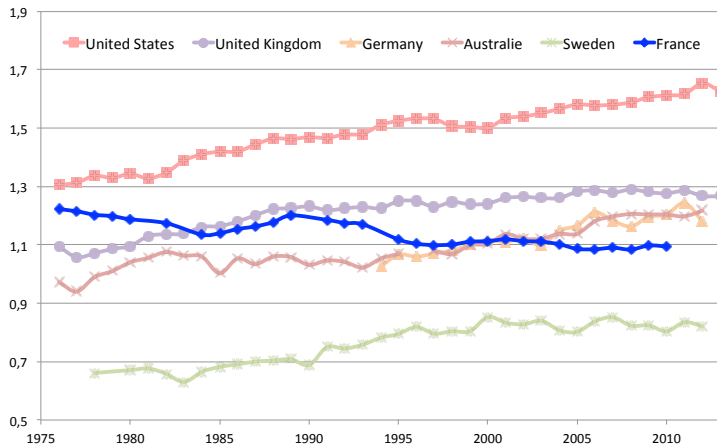


Source: OECD statistics.

# Motivation

## with the exception of France

Figure 2: Wage inequality (P90/P10 log gross wage ratio)



Source: OECD statistics.

# Debated explanations

- **Technological change explanations**
  - Skill-biased technological change (SBTC)
    - Katz and Murphy (1992); Card and Lemieux (2001); Autor, Katz and Kearny (AKK, 2006)
  - Job polarization
    - Autor, Levy, Murnane (2003); Goos and Manning (2007); Autor (2015)

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- **Globalization**

- Feenstra and Hanson (2002); Autor, Dorn and Hanson (2013)

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- **Globalization**

- Feenstra and Hanson (2002); Autor, Dorn and Hanson (2013)

- **Institutional factors**

- Minimum wage: Lee (1999), Card and Lemieux (2001)
- Unions: Fortin and Lemieux (1997)
- Education policies

# Debated explanations

## French case challenges the usual consensus

- **Some consensus**

- Strong support for a demand shift towards skilled workers
  - in many countries, notably in the U.S. (AKK, 2006; Autor, 2015), the U.K. (Lindley and Machin, 2011) and Germany (Dustmann et al. 2009).
- Limited impact of U.S. minimum wage or unions (AKK, 2006; Autor, Manning and Smith, 2016)

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- Limited impact of U.S. minimum wage or unions (AKK, 2006; Autor, Manning and Smith, 2016)

- **French case is puzzling**

- Wage compression and limited evidence of demand shifts (Card et al. 1999, Goux and Maurin 2000, Koubi et al. 2005, Verdugo 2014)
- Some evidence by Charnoz et al. (2014)
- Even though exposed to SBTC and trade competition
- High minimum wage may play a role but cannot explain the reduction in upper-tail inequalities



# This paper

- ① Compute labour cost, posted wages, and net wages measures of inequalities
  - Labour cost inequalities increased in France by about 20% between 1976 and 2015

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# This paper

- ① Compute labour cost, posted wages, and net wages measures of inequalities
  - Labour cost inequalities increased in France by about 20% between 1976 and 2015
- ② Revisit demand-side explanations using labour cost instead of gross wages
  - That's how it needs to be done
  - Would not change the picture in the U.S.
- ③ Discuss the impact of income and payroll taxes on inequalities
  - Seem to have been neglected in the debate opposing demand shifts to institutions
  - Might be an (efficient) institutional tool counteracting SBTC
  - Depends on the long-run incidence of taxes

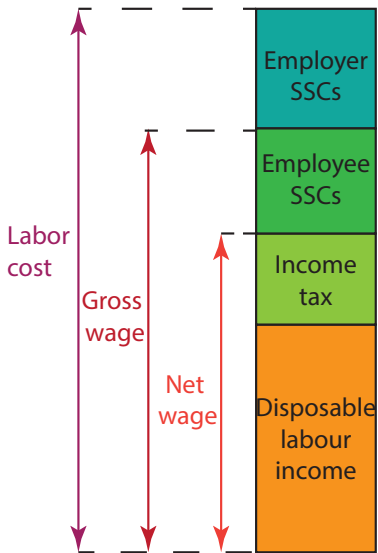
# Outline

- ① Data
- ② SSC changes
- ③ Wage inequality measures
- ④ Revisiting demand shifts
- ⑤ Can taxation reduce net wage inequalities ?

# Data

- Déclarations Annuelles de Données Sociales (DADS), 1976-2010.
  - Administrative data based on social security records
  - Sample : 1/24 before 1993, 1/12 after 1993
  - Wage variable: annual net earnings
- EDP (1968, 1975, 1982, 1990, 1999 and 2004 to 2010)
  - National censuses
  - Sample : 4/365
  - Educational attainment, demographic information

Figure 3: Illustration of main wage concepts



# Computation of wage concepts

- **Net wage** = Posted wage – employee SSCs
  - Directly observed in DADS data (annual earnings of individuals working full-time the whole year).
- **Gross wage** = Posted wage = net wage + employee SSCs
  - Computed using the tax simulator of IPP, **TAXIPP**.
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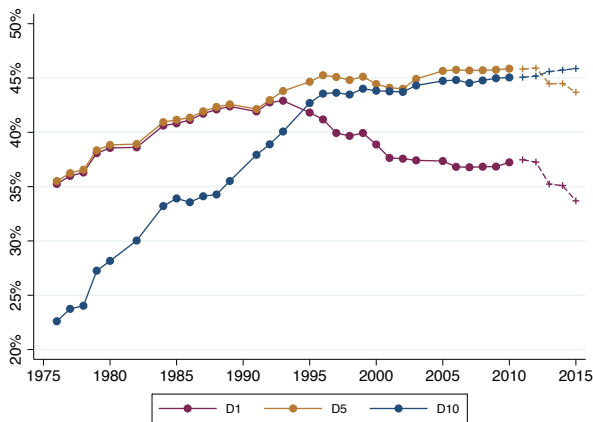


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- **Net wage + contributive SSCs**: **net wage** + employer and employee contributions linked to future benefits (pensions and unemployment)
  - Computed using the tax simulator of IPP, **TAXIPP**.

# Social Security contributions (SSCs)

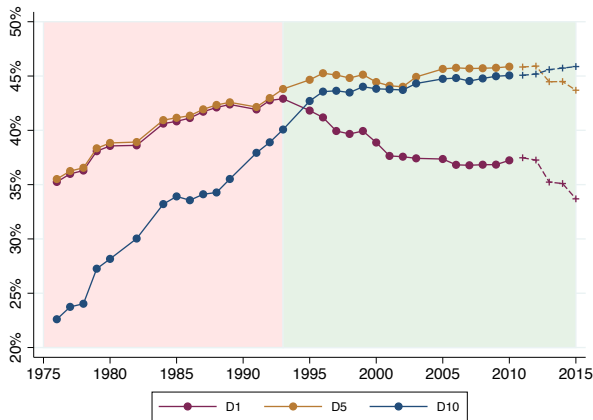
Figure 4: Total SSCs as a fraction of labour costs (by decile)



Sources: DADS data 1976-2010. The figure provides the ratio of the average total social security contributions (employer and employee part) to the average labour cost in each decile of the labour cost distribution.

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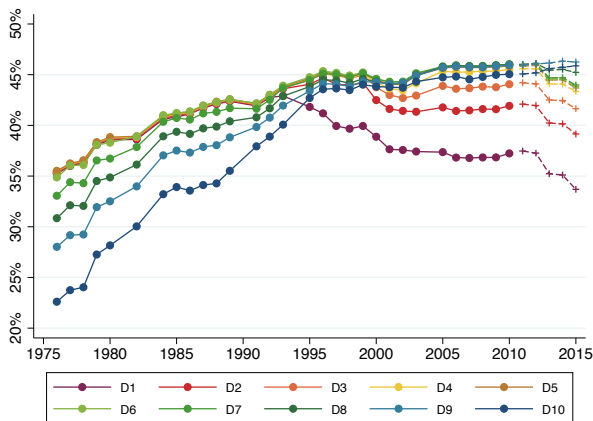
Figure 5: Total SSCs as a fraction of labour costs (by decile)



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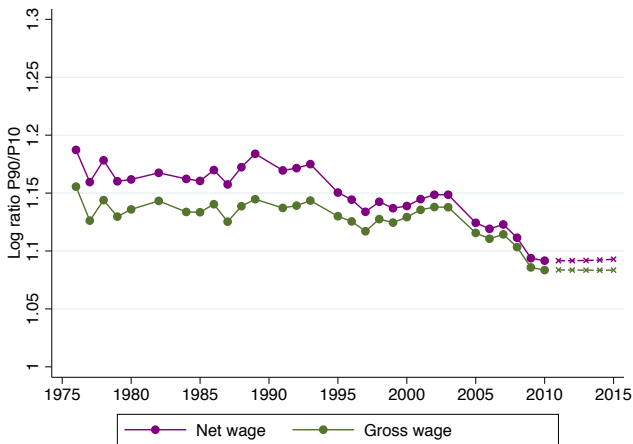
Figure 6: Total SSCs as a fraction of labour costs (by decile)



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# Wage inequalities: 3 measures

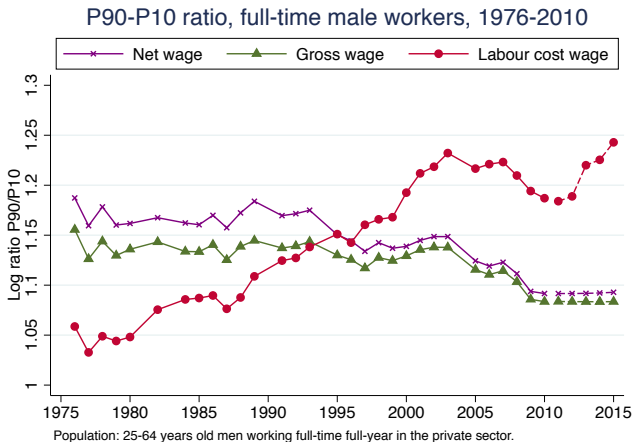
Figure 7: P90-P10 ratio, full-time full-year male workers



Sources: DADS data 1976-2010. The figure depicts the P90-P10 log wage gaps for net, gross and labour cost wages of male workers of the private sector working full-time full-year.

# Wage inequalities: 3 measures

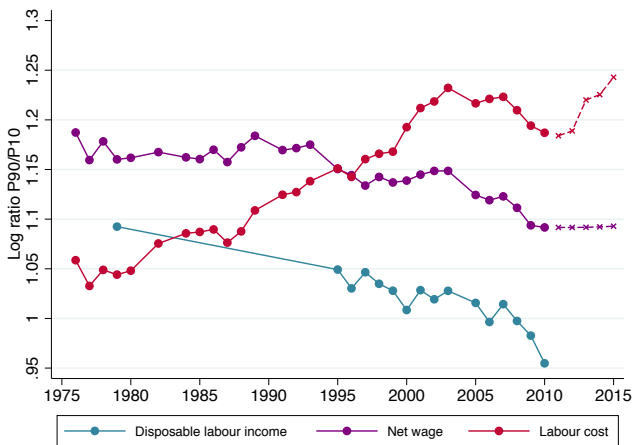
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# Disposable labour income and net wage: parallel trends

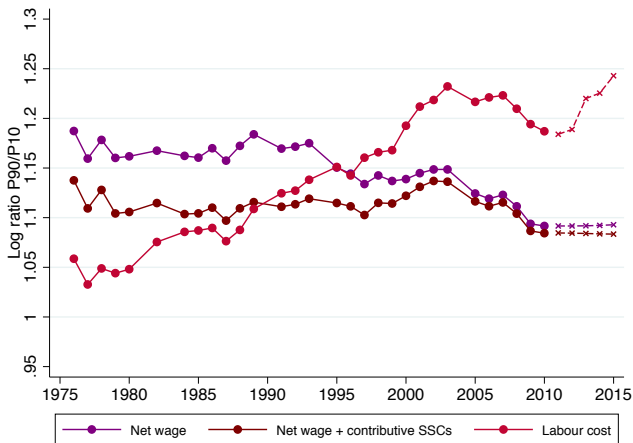
Figure 9: P90-P10 ratio, full-time full-year male workers



Note: The two additional series are in terms of net-of-tax wage and of net wage plus contributive employer and

# SSC reforms mostly on non-contributive SSCs

Figure 10: P90-P10 ratio, full-time full-year male workers



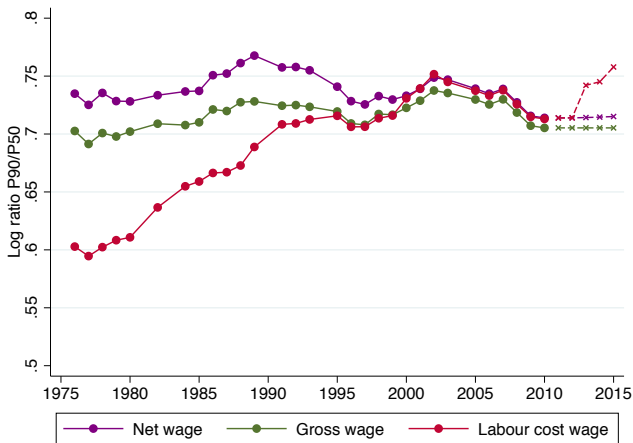
Note: The two additional series are in terms of net-of-tax wage and of net wage plus contributive employer and employee SSC.

► With unemployed



# Upper-tail wage inequalities

Figure 11: P90-P50 ratio, full-time full-year male workers



SOURCE: DADS data 1976-2010.

# Lower-tail wage inequalities

Figure 12: P50-P10 ratio, full-time full-year male workers



SOURCE: DADS data 1976-2010.

# Wage inequality: international comparisons

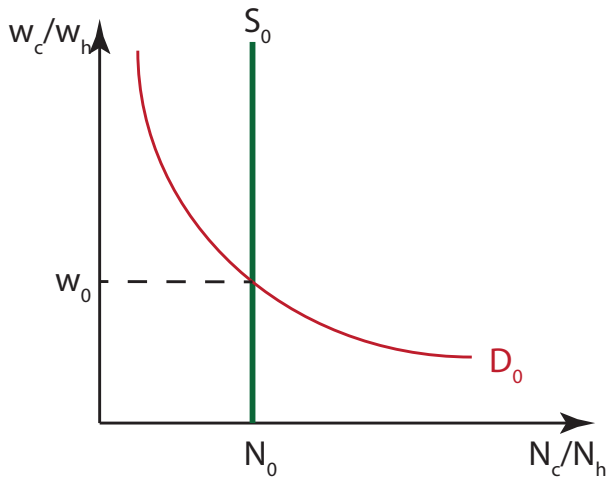
Table 1: Changes in P90/P10 by country, 1980-2010.

	1980	1990	2000	2010	% change, 1980-2010
Poland	2.81	2.88	3.56	3.96	0.33
U.S.	3.83	4.34	4.49	5.01	0.20
Sweden	1.96	1.99	2.35	2.23	0.20
U.K.	2.99	3.43	3.46	3.58	0.16
Australia	2.83	2.81	3.01	3.33	0.16
<b>France labour cost</b>	3.00	3.14	3.32	3.46	<b>0.13</b>
Finland	2.47	2.49	2.41	2.52	0.02
Japan	3.00	3.16	2.97	2.96	-0.01
<b>France net wage</b>	3.28	3.30	3.04	2.99	<b>-0.08</b>

Notes: net, gross and labor cost wages from the DADS data 1980-2010 for France, gross wage from the OECD for the other countries.

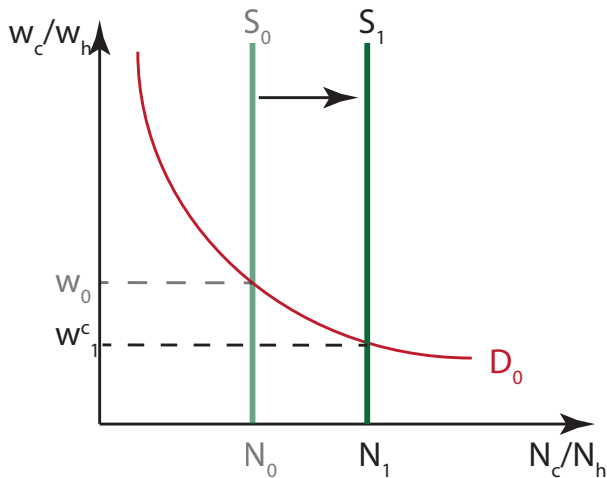
# Revisiting SBTC

Figure 13: Supply and demand of skills framework



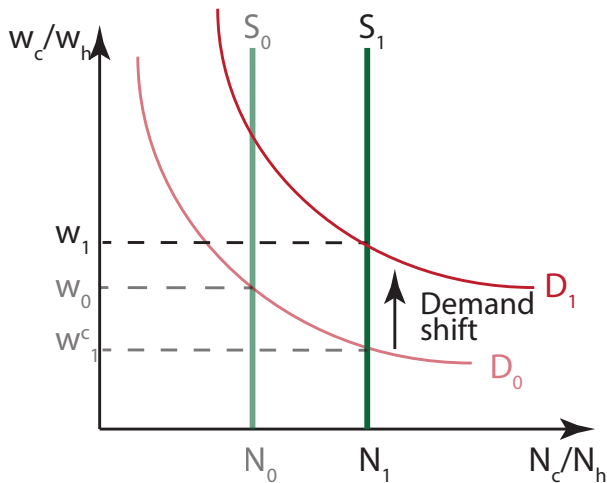
# Revisiting SBTC

Figure 14: Supply and demand of skills framework



# Revisiting Demand shifts

Figure 15: Supply and demand of skills framework



# Revisiting SBTC

## A simple model for the Supply and Demand of skills

Aim : explaining relative wage as a function of relative supply and relative factor demand shifts CES production function of

output  $Q$  with two factors:

- College equivalent workers:  $c$
- High school equivalent workers:  $h$

$$Q_t = [\alpha_t (a_t D_{ct})^\rho + (1 - \alpha_t) (b_t D_{ht})^\rho]^{1/\rho}$$

Where:

- $D_{ct}$  ( $D_{ht}$ ) is the quantities used of type  $c$  ( $h$ ) at  $t$
- $\alpha_t$ : time-varying technology parameter
- $a_t$  and  $b_t$ : technical change parameters

# Revisiting SBTC

$$\ln \left( \frac{w_{ct}}{w_{ht}} \right) = \beta_0 + \beta_1 t + \beta_2 \ln \left( \frac{S_{ct}}{S_{ht}} \right) + \epsilon_t$$

Assumptions:

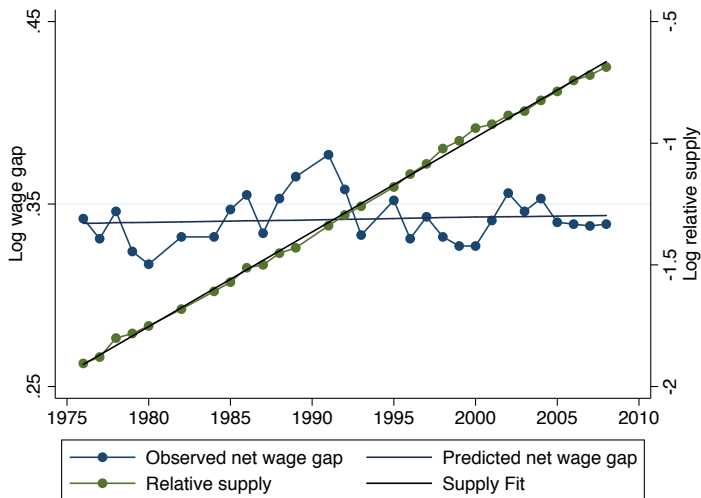
- 1 Market clearing  $\Rightarrow S_{it} = D_{it}, i = c, h$
- 2 Exogenous supply  $\Rightarrow$  **net wages** do not matter
- 3 Demand shift approximated by a time trend

► With taxes



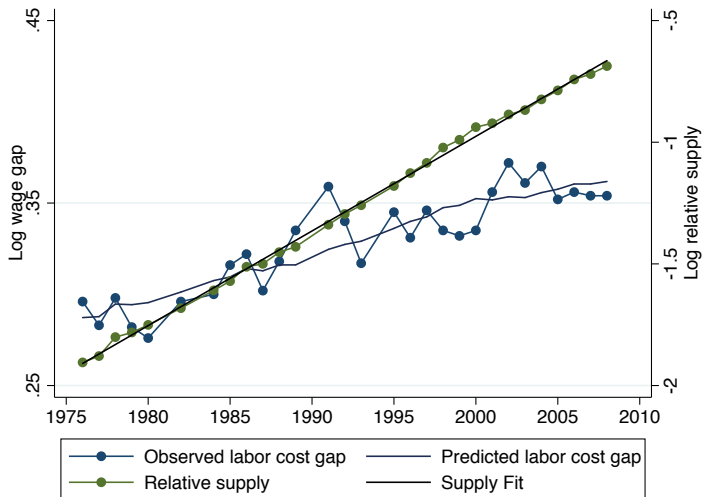
# Revisiting SBTC

Figure 16: Relative labour supply and net wage premium: 1976 - 2008



# Revisiting SBTC

Figure 17: Relative labour supply and labour cost wage premium: 1976 - 2008



# Revisiting SBTC

- **Lack of identification of the model**
  - Relatively linear relative supply shift
  - No identification of breaks in supply (contrary to the U.S.)
- **Calibration exercise**
  - Assuming effect of relative supply on wage gap (from the U.S. estimation)
  - Applying the supply change observed in France
  - Deduce from time trend the estimated demand shift
    - ⇒ Similar estimate of SBTC in France

# Revisiting SBTC

## U.S. versus France

Table 2: College/High School log wage gap

	Estimates for the U.S. from AKK 1965-2005			Estimates for France <i>Log Labour cost</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Relative supply (CLG vs HS)	-0.411 (0.046)	-0.599 (0.112)	-0.403 (0.067)	-0.411 <i>calib.</i>	-0.599 <i>calib.</i>	-0.403 <i>calib.</i>
Log real min. wage			0.117 (0.047)			0.114 (0.107)
Unemp. Rate (males)			0.001 (0.004)			-0.002 (0.197)
Time	0.018 (0.001)	0.028 (0.006)	0.017 (0.002)	0.017 (0.000)	0.028 (0.000)	0.017 (0.000)
Time2/100		-0.011 (0.006)			-0.014 (0.004)	
Constant	0.043 (0.037)	0.143 (0.108)	0.266 (0.112)	-0.587 (0.000)	-1.015 (0.000)	-1.66 (0.018)
Observations	43	43	43	31	31	31
R2	0.934	0.940	0.944	0.987	0.993	0.987

Notes: Standard errors in parentheses. All variables are in 2010 euros. Minimum wage is labour cost terms in columns (4) to (6).

# Can taxation reduce inequalities ?

- **Depends on incidence of SSCs**
  - SSCs reforms may have reduced net wage inequalities if long-run incidence falls on employees
  - What are counterfactual wage inequalities in the absence of SSC changes?

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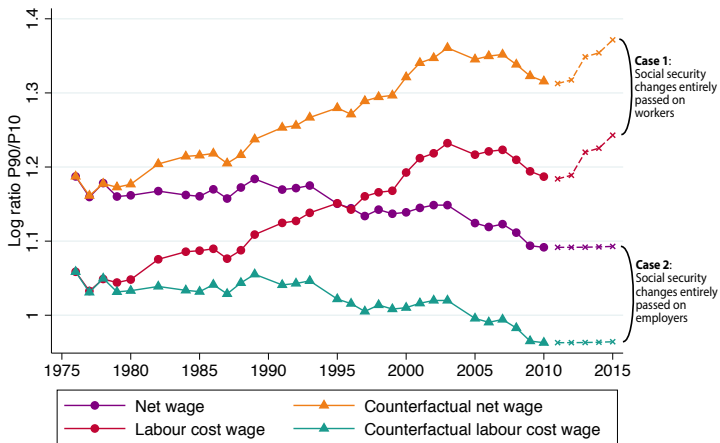
- SSCs reforms may have reduced net wage inequalities if long-run incidence falls on employees
- What are counterfactual wage inequalities in the absence of SSC changes?

- **Two polar cases**

- Assume no behavioural responses
- Assume either full incidence on employees, or full incidence on employers

# Can taxation reduce inequalities ?

Figure 18: Wage inequalities in the absence of tax changes: two polar cases



SOURCE: DADS data 1976-2010. The figure offers two scenarios of incidence, on workers or on employers, absent any behavioral responses, for male workers of the private sector working full-time full-year.

# Can taxation reduce inequalities ?

- **Demand shifts as evidence of incidence?**
  - Demand shifts may be of similar magnitude in developed countries (similar exposure to SBTC and globalization)



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- **Unless the supply of skills has increased more in France**

- The increase in the supply of skills exerts a downward pressure on wage inequalities
- But this increase has not been higher in France than in the US or the UK. [▶ Graph](#)

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- The increase in the supply of skills exerts a downward pressure on wage inequalities
- But this increase has not been higher in France than in the US or the UK. [▶ Graph](#)

- **But high minimum wage in France?**

- Can play a role in the bottom half of the wage distribution
- But cannot explain upper half decrease in net wage inequalities

# Can taxation reduce inequalities ?

Figure 19: P90-P50 ratio, full-time male workers, 1976-2010



SOURCE: DADS data 1976-2010.

# Behavioral responses

- Taxes could generate inefficiencies...
  - ① lower incentive to accumulate skills (if incidence on workers)
  - ② specialisation in lower-skill technology, less innovation (if incidence on firms)

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  - ① lower incentive to accumulate skills (if incidence on workers)
  - ② specialisation in lower-skill technology, less innovation (if incidence on firms)
- ... which are hard to detect in the data
  - ① no breaks in the accumulation of skills that could be linked to tax changes
  - ② increase rather than decrease in the demand for skilled workers
    - but hard to distinguish SBTC demand shifts from tax-driven demand shifts

# Conclusions

- **Labour cost inequalities in France**
  - Using labour cost changes the assessment on French data
  - France is no exception after all
  - Reinforces demand-side explanations for increased wage inequalities
  - Perspective might change for other countries too

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  - France is no exception after all
  - Reinforces demand-side explanations for increased wage inequalities
  - Perspective might change for other countries too
- **Incidence of SSCs**
  - Demand shift provides macro-level evidence for long-run incidence of SSCs on employees



# Perspectives

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- Other countries ?
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  - Compare supply of skills, net wages and labor costs across countries.
  - Compare French policies (high MW/SSCs reductions) with tax credit policies and lower MW countries (e.g. EITC in the U.S., WFTC in the U.K.)
  - Political economy aspect of doing redistribution with SSCs.

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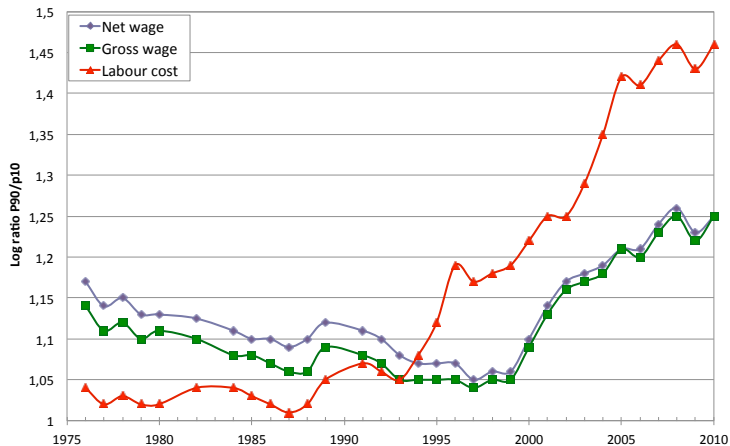
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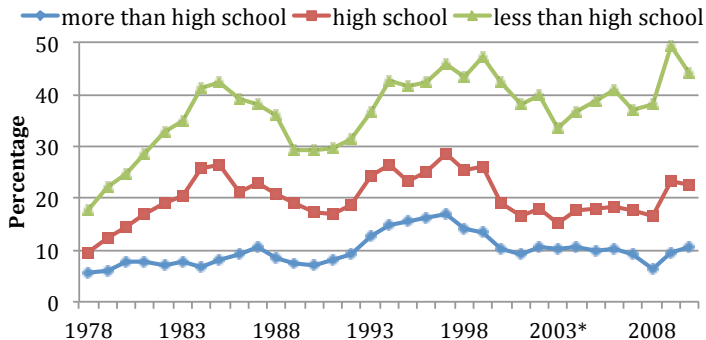
# Including unemployed, paid at MW

Figure 20: P90-P10 ratio, full-time male workers, 1976-2010



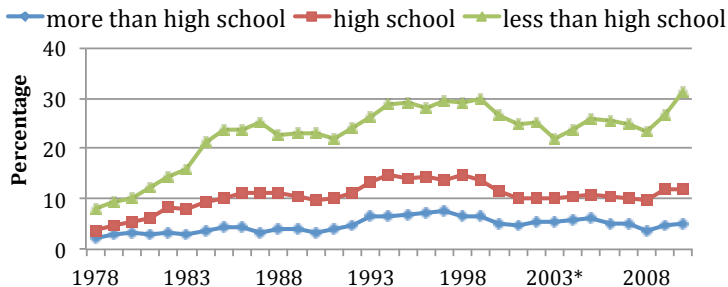
SOURCE: DADS data 1976-2010.

**Figure 21:** Unemployment rate by educational attainment, 1978-2010: Workers with less than five years of experience



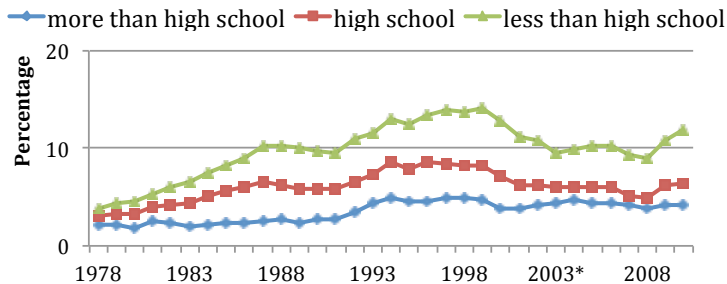
SOURCE: Labor force survey 1978-2010.

Figure 22: Unemployment rate by educational attainment, 1978-2010: Workers with five to ten years of experience



SOURCE: Labor force survey 1978-2010.

Figure 23: Unemployment rate by educational attainment, 1978-2010: Workers with more than ten years of experience

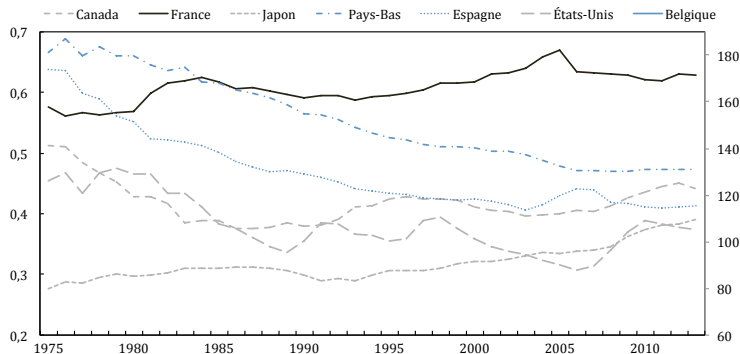


SOURCE: Labor force survey 1978-2010.



# II-Minimum wage and inequalities

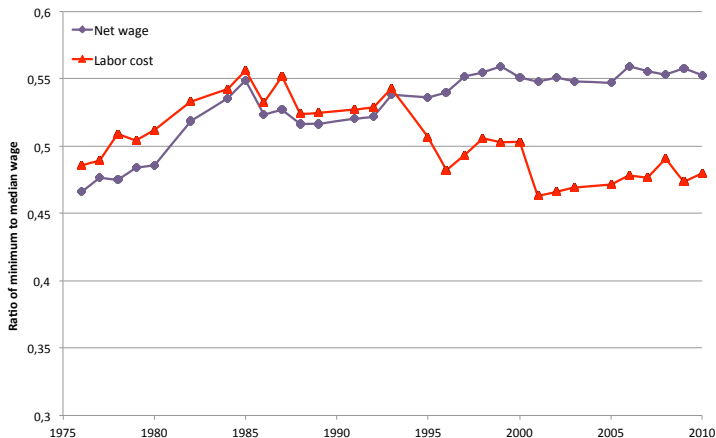
Figure 24: Ratio of minimum to median gross wage, OECD countries, 1975-2013



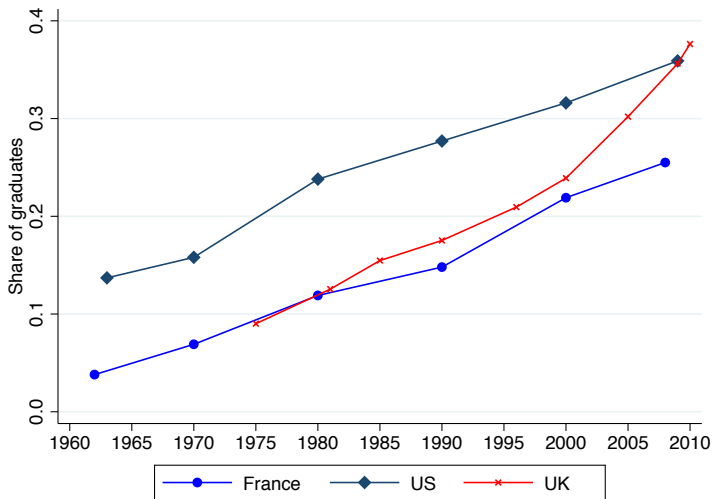
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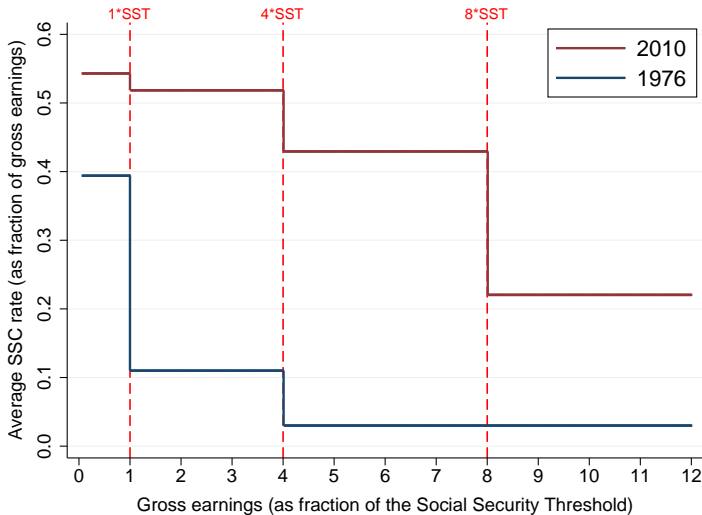
Figure 25: Ratio of minimum to median wage, France: net versus labour cost



SOURCE: DADS data 1976-2010.

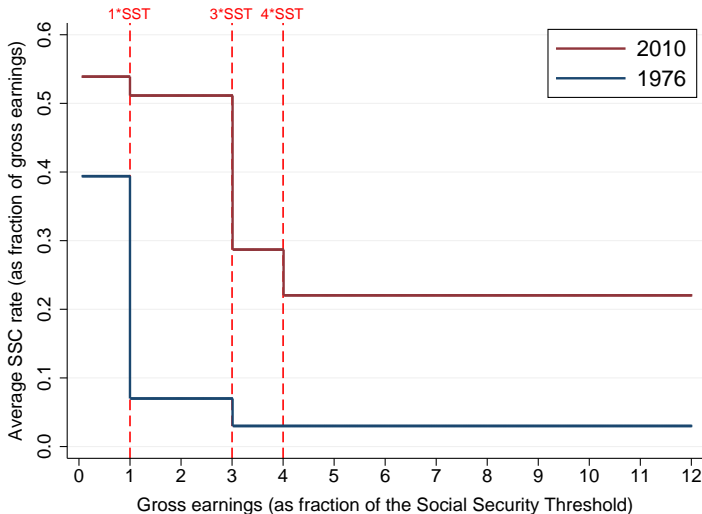


**Figure 27:** Marginal SSC rates by brackets of earnings for executives in 1976 and 2010.



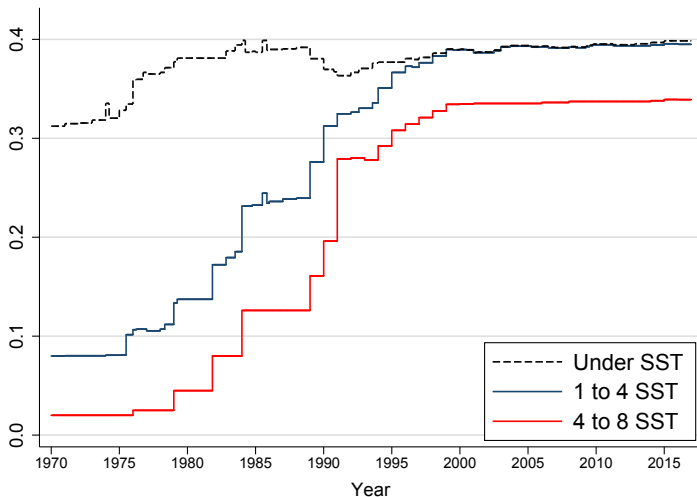
NOTE: : Employer+Employee rate. SST at  $\approx$  p70, 8SST at  $\approx$  p99.95

**Figure 28:** Marginal SSC rates by brackets of earnings for non executives in 1976 and 2010.

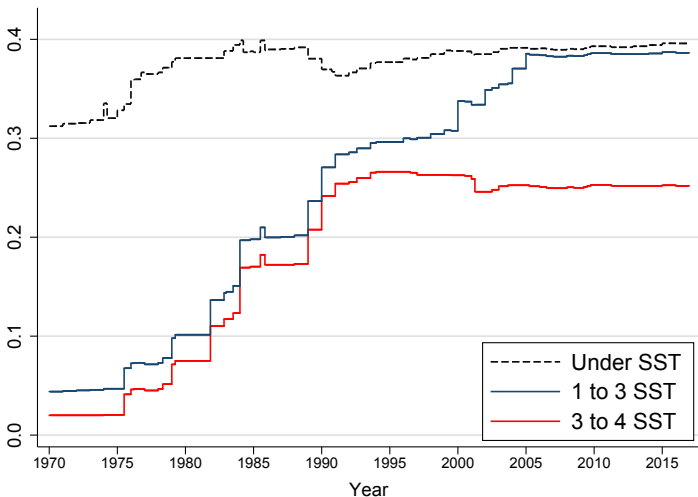


NOTE: : Employer+Employee rate. SST at  $\approx$  p70, 8SST at  $\approx$  p99.95

**Figure 29:** Marginal employer SSC rates for executives, private sector, 1970-2016



**Figure 30:** Marginal employer SSC rates for non-executives, private sector, 1970-2016



**Figure 31:** Marginal employee SSC rates for non-executives, private sector, 1970-2016

