Incidence of Social Security Contributions: Evidence from France

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*Paris School of Economics (PSE) and Institut des politiques publiques (IPP)

Workshop “Incidence and labour market effects of SSCs”

London, 1st March 2016
Introduction

- **Social Security contributions (SSCs)**
  - 25% of tax revenues in OECD (40% in France)
  - Little empirical research compared to income taxation
  - French policy debate: high employer SSCs accused of causing high unemployment

LITERATURE ON INCIDENCE OF SSCS

- Mixed results: from full shifting to employees to fully incident on employers
- Old literature: time series and cross-country regressions
Introduction

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  - Old literature: time series and cross-country regressions
Introduction

• **Why no consensus?**
  1. Identification issues
  2. Short-term vs long-term incidence
  3. Different institutional settings bound to matter
Introduction

- Why no consensus?
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  2. Short-term vs long-term incidence
  3. Different institutional settings bound to matter

- Tax-benefit linkage
  - Should matter for incidence (Summers, 1989)
  - Individuals incorporate expected benefits into their labour supply decision
Introduction

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- Tax-benefit linkage
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  - Individuals incorporate expected benefits into their labour supply decision

- Different institutional settings
  - Gruber (1997): privatisation of Chilean pension system
  - Saez et al. (2012): cohort reform in Greece producing a dual schedule of SSCs
Introduction

- **In this paper, we exploit**
  - The largest SSC reforms in France since 1976
  - Different tax-benefit linkages for each reform
  - Administrative panel data on earnings
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- The largest SSC reforms in France since 1976
- Different tax-benefit linkages for each reform
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Two empirical approaches:

- Differences-in-differences (DiD)
- Regression kink design (KRD)
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- Different tax-benefit linkages for each reform
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Two empirical approaches
- Differences-in-differences (DiD)
- Regression kink design (KRD)

Work in progress
- Comments welcome
Outline

1. Introduction
2. SSC reforms in France
3. Data
4. Empirical strategy 1: DiD
5. Empirical strategy 2: RKD
6. Preliminary conclusion
II. SSC reforms in France

- **SSCs in France**
  - Many different SSCs
    - Contributory: pension SSC, UI SSC
    - Non-contributory: family SSC, health care SSC
  - Different SSC schedule for public/private wage earners and executives/non-executives
II. SSC reforms in France

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- **SSC schedule**
  - Rates applied to gross (posted) earnings
  - Reference to earnings cap: Social Security Threshold (SST)
  - SSC schedule applied to different earnings brackets:
    - 0-1 SST (P70), 1-4 SST (P98), 4-8 SST (P99.5)
  - SSC schedule applied to hourly wage
II. SSC reforms in France

- **Increase in SSCs above SST (1980s, 1990s)**
  - Largest increases in SSCs (mostly employer SSCs)
II. SSC reforms in France

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- **Two “uncapping” reforms**
  - Heath care and family SSCs
  - Non-contributory SSCs
II. SSC reforms in France

- **Increase in SSCs above SST (1980s, 1990s)**
  - Largest increases in SSCs (mostly employer SSCs)
- **Two “uncapping” reforms**
  - Health care and family SSCs
  - Non-contributory SSCs
- **Two reforms increasing SSC rates for complementary pension schemes**
  - Strong tax-benefit linkage: point-based pension systems
  - Increase in rates lead to increase in pension benefits
  - Executive and non-executive schemes (Agirc and Arrco schemes)
II. SSC reforms in France

1 Reform 1: Uncapping of health care SSCs
- Health care employer SSCs capped at the SST until 1980
- Uncapped in 2 years (Nov. 1981 and Jan. 1984)
- Employer SSC rate above the SST: +9.6 ppt
- No change in employee SSC rate
II. SSC reforms in France

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   - Employer SSC rate above the SST: +9.6 ppt
   - No change in employee SSC rate

2. Reform 2: Uncapping of family SSCs
   - Family employers SSCs capped at the SST until 1988
   - Uncapped in 2 years (1989-90)
   - Employer SSCs above the SST: +8.2 ppt
   - Small reduction in employer SSC rate below the SST
   - No employee SSCs
## II. SSC reforms in France

### Marginal SSC rates before/after reforms

<table>
<thead>
<tr>
<th></th>
<th>Employer SSCs</th>
<th>Employee SSCs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under SST</td>
<td>1 to 3 SST</td>
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<tr>
<td><strong>Reform 1: Uncapping of health care SSCs (1981 and 1983)</strong></td>
<td></td>
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<tr>
<td>1980</td>
<td>38.1</td>
<td>10.2</td>
</tr>
<tr>
<td>1984</td>
<td>39.0</td>
<td>19.7</td>
</tr>
<tr>
<td>Difference</td>
<td>0.9</td>
<td>9.6</td>
</tr>
</tbody>
</table>

| **Reform 2: Uncapping of family SSCs (1989 and 1990)** |               |               |           |           |           |           |
| 1988               | 39.2          | 20.2          | −19.0      | 17.0      | 10.9      | −6.1       |
| 1991               | 36.3          | 28.4          | −8.0       | 17.3      | 11.3      | −6.0       |
| Difference         | −2.9          | 8.2           | 11.0       | 0.3       | 0.4       | 0.1        |

*Sources: IPP Tax and Benefit Tables (April 2015); TAXIPP 0.4.*
II. SSC reforms in France

3 Reform 3: Executives pensions SSCs

- In 1991, introduction of mandatory SSCs on earnings between 4 and 8 SST
- Employer SSC rate (above 4 SST) jumped by 8 ppt
- Also increase in employee SSC
- But 1989-90 uncapping of family SSCs at the same time
II. SSC reforms in France

3 **Reform 3: Executives pensions SSCs**
- In 1991, introduction of mandatory SSCs on earnings between 4 and 8 SST
- Employer SSC rate (above 4 SST) jumped by 8 ppt
- Also increase in employee SSC
- But 1989-90 uncapping of family SSCs at the same time

4 **Reform 4: Non-executives pensions SSCs**
- Progressive increase (2000-2005) in SSC for earnings between 1 to 3 SST
- Employer SSCs: +7.5 ppt
- Employee SSCs: +4.5 ppt
II. SSC reforms in France

Marginal SSCs before/after reforms

<table>
<thead>
<tr>
<th></th>
<th>Employer SSCs</th>
<th>Employee SSCs</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>1 to 4 SST</td>
<td>1 to 4 SST</td>
</tr>
<tr>
<td></td>
<td>4 to 8 SST</td>
<td>4 to 8 SST</td>
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<tr>
<td></td>
<td>Difference</td>
<td>Difference</td>
</tr>
<tr>
<td>Reform 3: Increase in contributory pension SSCs – executives only (1991)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>22.7</td>
<td>11.2</td>
</tr>
<tr>
<td>1991</td>
<td>31.3</td>
<td>11.7</td>
</tr>
<tr>
<td>Difference</td>
<td>8.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Reform 4: Increase in contributory pension SSCs – non-executives only (2000–2005)</td>
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<td></td>
</tr>
<tr>
<td>1999</td>
<td>38.9</td>
<td>13.4</td>
</tr>
<tr>
<td>2005</td>
<td>39.1</td>
<td>13.6</td>
</tr>
<tr>
<td>Difference</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Sources: IPP Tax and Benefit Tables (April 2015); TAXIPP 0.4.
II. SSC reforms in France

Marginal Employer SSC Rates, non-executives

Sources: IPP Tax and Benefit Tables (April 2015) ; TAXIPP 0.4.
II. SSC reforms in France

Marginal Employer SSC Rates, non-executives

Sources: IPP Tax and Benefit Tables (April 2015) ; TAXIPP 0.4.
II. SSC reforms in France

Marginal Employer SSC Rates, executives

Sources: IPP Tax and Benefit Tables (April 2015) ; TAXIPP 0.4.
II. SSC reforms in France

Marginal Employer SSC Rates, executives

Reform 3
Increase in pensions contributions above 4 SST for executives

+6.8 ppt
(4-8 SST vs 1-4 SST)

Sources: IPP Tax and Benefit Tables (April 2015); TAXIPP 0.4.
III. Data

- **DADS panel 2010**
  - Employer-employee administrative data reported by employers to SS schemes
  - 1/25 sample for years 1976-2001, 1/12 from 2002 onwards
  - 1.1 million workers each year (2.2 million in recent years)
III. Data

- **DADS panel 2010**
  - Employer-employee administrative data reported by employers to SS schemes
  - 1/25 sample for years 1976-2001, 1/12 from 2002 onwards
  - 1.1 million workers each year (2.2 million in recent years)

- **Variables available**
  - Start and end of job spell, firm size, sector, occupation
  - Net taxable earnings available throughout the period
  - Gross earnings and hours available from 1993 onwards
III. Data

- **Computing gross earnings**
  - Gross earnings estimated by INSEE pre 1993: does not reflect specific changes in SSCs (sector average)
  - Computation of gross earnings from taxable earnings using IPP microsimulation model (TAXIPP)
III. Data

- **Computing gross earnings**
  - Gross earnings estimated by INSEE pre 1993: does not reflect specific changes in SSCs (sector average)
  - Computation of gross earnings from taxable earnings using IPP microsimulation model (TAXIPP)

- **Simulating SSC using TAXIPP**
  - We compute all SSCs, and get labour cost
  - Very detailed simulations of SSCs (no specific local SSC reductions, nor local variations in public transport SSCs)
IV. Empirical approach – DiD

Methodology

- **Control and treatment groups**
  - Create balanced panel (individuals observed in all years)
  - Reference year = reform - 1
  - Treatment: SST < earnings in ref. year ≤ 1.6 SST
  - Control: 0.8 SST ≤ earnings in ref. year ≤ SST
IV. Empirical approach – DiD

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  - Control: 0.8 SST ≤ earnings in ref. year ≤ SST

- **DiD, graphical evidence**
  - Normalise earnings at 100 in reference year
  - Compare change in net earnings/labour cost before/after reform
IV. Empirical approach – DiD

Reform 1: Uncapping of health care SSC

Change in real net earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 1: Uncapping of health care SSC

Change in real labour cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 2: Uncapping of family SSC (1989-90)

Change in real net earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 2: Uncapping of family SSC (1989-90)

Change in real labour cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD
Reform 3: executive scheme in 1991

Change in real net earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 3: executive scheme in 1991

Change in real labour cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 4: Non-executive scheme in 1999-2005

Change in real net earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 4: Non-executive scheme in 1999-2005

Change in real labour cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Methodology

- **Dynamic DiD estimates**
  Regress log(earnings) on year dummies, treatment group ($T_i$) and interacted year x $T$ dummies

\[
\log(w_{it}) = \alpha + \sum_{k=-3}^{8} \beta_k \cdot 1\{t = k\} + \delta \cdot T_i + \sum_{k=-3}^{8} \gamma_k (T_i \times 1\{t = k\}) + \varepsilon_{it}
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\]

- **Share of SSC incident on employer by 2SLS**
  Restrict sample to earnings in base year 0 and in end-year $y$ and regress log(labour cost) on log(1+SSC rate), instrumented by year x $T$ dummy

\[
\log(z_{it}) = \alpha + \beta \cdot \log(1 + \text{SSC}_\text{rate}_{it}) + \delta \cdot 1\{t = y\} + \gamma \cdot T_i + \epsilon_{it}
\]
IV. Empirical approach – DiD

Incidence vs earnings responses

- **Incidence is a change in wage rate**
  - Hours not observed in the data before 1993
  - Not possible to distinguish incidence from behavioural response
  - Need to assume no behavioural response
IV. Empirical approach – DiD
Incidence vs earnings responses

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- **Incidence or behavioural responses?**
  - We use only full-time employees in balanced panel
  - Substitution effects would lead to a reduction in hours, hence lower earnings (opposite for income effects)
  - Would lead to confuse behavioural responses with incidence on employees (if small income effects)
IV. Empirical approach – DiD Identification

- **Common trend assumption**
  - Just below and just above the threshold, common trend assumption should hold
  - BUT, very small differences in average SSC rates
  - Tradeoff between how far we go from threshold and validity of common trend assumption

Inequality trends

See yesterday Bozio, Breda and Guillot (2015)

If structural wage inequality trend, then common trend assumption more likely to be violated

Bias towards finding incidence on employers
IV. Empirical approach – DiD

Identification

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IV. Empirical approach – DiD
Reform 1: health care SSC uncapping

Log Difference in Net Earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD
Reform 1: health care SSC uncapping

Log Difference in Labour Cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 1: health care SSC uncapping

Log Difference in SSC Rates (First Stage)

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD
Reform 1: health care SSC uncapping

Employer Share of Incidence (2SLS)

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD
Reform 2: family SSC uncapping

Log Difference in Net Earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
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Reform 2: family SSC uncapping

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Employer Share of Incidence (2SLS)

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IV. Empirical approach – DiD
Reform 4: increase in non-executive pension SSC

Log Difference in Net Earnings

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 4: increase in non-executive pension SSC

Log Difference in Labour Cost

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD
Reform 4: increase in non-executive pension SSC

Log Difference in SSC Rates (First Stage)

Sources: DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 4: increase in non-executive pension SSC

Employer Share of Incidence (2SLS)

Sources: DADS Panel 2010; TAXIPP 0.4.
### IV. Empirical approach – DiD

**Reform 1: Uncapping of Health Care SSCs**

<table>
<thead>
<tr>
<th>Model: Dep. Var.</th>
<th>First stage</th>
<th>Reduced Form</th>
<th>2SLS: incidence on employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Log(1+SSC rate)</td>
<td>Log(net earnings)</td>
<td>Log(labour cost)</td>
</tr>
<tr>
<td>$T_0+2$</td>
<td>0.0138***</td>
<td>−0.0022</td>
<td>0.0117***</td>
</tr>
<tr>
<td></td>
<td>(0.0004)</td>
<td>(0.0031)</td>
<td>(0.0029)</td>
</tr>
<tr>
<td>$T_0+3$</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
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<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>$T_0+4$</td>
<td>0.0193***</td>
<td>−0.0100***</td>
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<td>(0.0031)</td>
<td>(0.0029)</td>
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<td>$T_0+5$</td>
<td>0.0202***</td>
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<td>(0.0029)</td>
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<tr>
<td>$T_0+6$</td>
<td>0.0205***</td>
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<td>(0.0029)</td>
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<td>$T_0+8$</td>
<td>0.0184***</td>
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<td>(0.0031)</td>
<td>(0.0029)</td>
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Number of obs. 338,700 338,700 338,700 338,700

**Notes:** Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

**Sources:** DADS Panel 2010; TAXIPP 0.4.
### IV. Empirical approach – DiD

**Reform 2: Uncapping of Family SSCs**

<table>
<thead>
<tr>
<th>Model:</th>
<th>First stage</th>
<th>Reduced Form</th>
<th>2SLS: incidence on employer</th>
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<tbody>
<tr>
<td></td>
<td>Dep. Var.: Log(1+SSC rate)</td>
<td>Log(net earnings)</td>
<td>Log(labour cost)</td>
</tr>
<tr>
<td>$T_0+2$</td>
<td>n/a</td>
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<td>$T_0+3$</td>
<td>0.0118***</td>
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<td>$T_0+4$</td>
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<td>0.0093***</td>
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<td>(0.0005)</td>
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<td>318,681</td>
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**Notes:** Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
**Sources:** DADS Panel 2010; TAXIPP 0.4.
IV. Empirical approach – DiD

Reform 4: increase in pension SSCs

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<tr>
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<td>0.0028</td>
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</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0028)</td>
<td>(0.0028)</td>
</tr>
<tr>
<td>$T_0+3$</td>
<td>0.0059***</td>
<td>0.0053*</td>
<td>0.0112***</td>
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<td>(0.0028)</td>
<td>(0.0028)</td>
</tr>
<tr>
<td>$T_0+6$</td>
<td>0.0061***</td>
<td>0.0000</td>
<td>0.0061**</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(0.0028)</td>
<td>(0.0028)</td>
</tr>
<tr>
<td>$T_0+7$</td>
<td>0.0066***</td>
<td>0.0020</td>
<td>0.0087***</td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0028)</td>
<td>(0.0028)</td>
</tr>
<tr>
<td>$T_0+8$</td>
<td>0.0065***</td>
<td>0.0002</td>
<td>0.0067**</td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0028)</td>
<td>(0.0028)</td>
</tr>
<tr>
<td>Nber of obs.</td>
<td>290,563</td>
<td>290,563</td>
<td>290,563</td>
</tr>
</tbody>
</table>

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

- **Regression kink design (RKD)**
  - Change in earnings $w$, between reference year 0 and year $y$ as function $f$ of initial earnings $w_{0i}$
    \[
    \mathbb{E}[w_{yi} - w_{0i}|w_{0i}] = f(w_{0i})
    \]
  - $f$ is assumed to be continuous and differentiable in the absence of reform
VI. Empirical approach – kinks

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    \]
  - $f$ is assumed to be continuous and differentiable in the absence of reform

- **Identification**
  - Denote $\tau_{ly}$ and $\tau_{ry}$ the marginal SSC rates below and above the SST in year $y$.
  - The reform-induced increase in the amount of SSCs is a kinked function of base year earnings $w_{0i}$

\[
\begin{aligned}
\Delta SSC &\approx 0 & \text{if } w_{0i} \leq \text{SST} \\
\Delta SSC &= (\tau_{ry} - \tau_{r0}) \times (w_{0i} - \text{SST}) & \text{if } w_{0i} > \text{SST}
\end{aligned}
\]
VI. Empirical approach – kinks

- **Regression kink design (RKD)**
  We estimate the change in the slope of the conditional expectation function of the outcome given the assignment variable at the kink:

\[
E(\Delta w_{iy}|w_{i0}) = \alpha_0 + \beta(w_{0i} - SST_0) + \gamma(w_{0i} - SST_0).D_i
\]

where \(D_i = 1 \text{ if } w_{i0} > SST_0\)
VI. Empirical approach – kinks

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  \[
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  \]
  where \( D_i = 1 \) if \( w_{i0} > SST_0 \)

- **Incidence by 2SLS**
  The incidence of SSC on labour cost is identified locally at the kink and is estimated using a fuzzy RKD estimator, where \( \Delta SSC_{iy} \) is instrumented by \( (w_{0i} - SST_0).D_i \)
  \[
  E(\Delta z_{iy} | w_{i0}) = \alpha + \beta.\Delta SSC_{iy} + \gamma(w_{0i} - SST_0)
  \]
VI. Empirical approach – kinks
Reform 1: health care SSC uncapping

Change in Net Earnings and Labour Cost around SST (T+4)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 1: health care SSC uncapping

Change in Net Earnings and Labour Cost around SST ($T+8$)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 2: family SSC uncapping

Change in Net Earnings and Labour Cost around SST (T+4)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 2: family SSC uncapping

Change in Net Earnings and Labour Cost around SST (T+8)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 4: increase in non-executive pension SSC

Change in Net Earnings and Labour Cost around SST (T+4)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 4: increase in non-executive pension SSC

Change in Net Earnings and Labour Cost around SST (T+8)

Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 1: Uncapping of Health Care SSCs

<table>
<thead>
<tr>
<th>Model: Dep. Var.</th>
<th>First stage</th>
<th>Reduced Form</th>
<th>2SLS: incidence on employer</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_0+4$</td>
<td>$4,910^{***}$</td>
<td>$5,198^{***}$</td>
<td>$1.059^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(396)$</td>
<td>$(1,251)$</td>
<td>$(0.251)$</td>
</tr>
<tr>
<td>$T_0+5$</td>
<td>$5,909^{***}$</td>
<td>$7,301^{***}$</td>
<td>$1.236^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(349)$</td>
<td>$(1,012)$</td>
<td>$(0.101)$</td>
</tr>
<tr>
<td>$T_0+6$</td>
<td>$6,439^{***}$</td>
<td>$7,760^{***}$</td>
<td>$1.205^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(533)$</td>
<td>$(2,152)$</td>
<td>$(0.241)$</td>
</tr>
<tr>
<td>$T_0+7$</td>
<td>$6,814^{***}$</td>
<td>$9,218^{***}$</td>
<td>$1.353^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(441)$</td>
<td>$(1,279)$</td>
<td>$(0.104)$</td>
</tr>
<tr>
<td>$T_0+8$</td>
<td>$7,466^{***}$</td>
<td>$11,178^{***}$</td>
<td>$1.497^{***}$</td>
</tr>
<tr>
<td></td>
<td>$(486)$</td>
<td>$(1,399)$</td>
<td>$(0.0940)$</td>
</tr>
</tbody>
</table>

Notes: Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 2: Uncapping of Family SSCs

<table>
<thead>
<tr>
<th>Model: Dep. Var.</th>
<th>First stage</th>
<th>Reduced Form</th>
<th>2SLS: incidence on employer</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_{0+4}$</td>
<td>$\Delta$ SSCs 6,277***</td>
<td>$\Delta$ Net earnings 2,408***</td>
<td>$\Delta$ Labour cost 8,686***</td>
</tr>
<tr>
<td></td>
<td>(448)</td>
<td>(731)</td>
<td>(1,173)</td>
</tr>
<tr>
<td>$T_{0+5}$</td>
<td>$\Delta$ SSCs 5,603***</td>
<td>$\Delta$ Net earnings 1,000 6,603***</td>
<td>$\Delta$ Labour cost 1.179***</td>
</tr>
<tr>
<td></td>
<td>(526)</td>
<td>(804)</td>
<td>(1,319)</td>
</tr>
<tr>
<td>$T_{0+6}$</td>
<td>$\Delta$ SSCs 6,021***</td>
<td>$\Delta$ Net earnings 1,156 7,177***</td>
<td>$\Delta$ Labour cost 1.192***</td>
</tr>
<tr>
<td></td>
<td>(626)</td>
<td>(892)</td>
<td>(1,505)</td>
</tr>
<tr>
<td>$T_{0+7}$</td>
<td>$\Delta$ SSCs 6,777***</td>
<td>$\Delta$ Net earnings 1,642* 8,419***</td>
<td>$\Delta$ Labour cost 1.242***</td>
</tr>
<tr>
<td></td>
<td>(647)</td>
<td>(934)</td>
<td>(1,568)</td>
</tr>
<tr>
<td>$T_{0+8}$</td>
<td>$\Delta$ SSCs 6,920***</td>
<td>$\Delta$ Net earnings 1,373 8,294***</td>
<td>$\Delta$ Labour cost 1.198***</td>
</tr>
<tr>
<td></td>
<td>(716)</td>
<td>(998)</td>
<td>(1,701)</td>
</tr>
</tbody>
</table>

Notes: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Sources: DADS Panel 2010; TAXIPP 0.4.
VI. Empirical approach – kinks

Reform 4: increase in pension SSCs

<table>
<thead>
<tr>
<th>Model: Dep. Var.</th>
<th>First stage</th>
<th>Reduced Form</th>
<th>2SLS: incidence on employer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\Delta$ SSCs</td>
<td>$\Delta$ Net earnings</td>
<td>$\Delta$ Labour cost</td>
</tr>
<tr>
<td>$T_{0}+5$</td>
<td>3,795***</td>
<td>−411.5</td>
<td>3,384**</td>
</tr>
<tr>
<td></td>
<td>(666)</td>
<td>(831)</td>
<td>(1,491)</td>
</tr>
<tr>
<td>$T_{0}+6$</td>
<td>4,591***</td>
<td>−616.6</td>
<td>3,975*</td>
</tr>
<tr>
<td></td>
<td>(864)</td>
<td>(1,255)</td>
<td>(2,104)</td>
</tr>
<tr>
<td>$T_{0}+7$</td>
<td>4,466***</td>
<td>−506.9</td>
<td>3,959**</td>
</tr>
<tr>
<td></td>
<td>(838)</td>
<td>(1,041)</td>
<td>(1,873)</td>
</tr>
<tr>
<td>$T_{0}+8$</td>
<td>4,057***</td>
<td>−1,022</td>
<td>3,035</td>
</tr>
<tr>
<td></td>
<td>(958)</td>
<td>(1,214)</td>
<td>(2,164)</td>
</tr>
</tbody>
</table>

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Sources: DADS Panel 2010; TAXIPP 0.4.
Conclusion

- **What have we found?**
  - Our DiD estimates point to partial shifting of employer SSCs, but common trend assumption can be discussed in the context of increase in wage inequality.
  - RKD offers stronger identification based on weaker assumption: our RKD estimates point to full incidence of SSCs on employers.
  - But RKD results are local (around the kink).

- **What do we plan to do?**
  - Estimate pre-reform differential trends.
  - Improve RKD using order 2 polynomials, get corrected s.e.
  - Look at employment effects.
  - Assess the incidence over the long run using all years/reforms.
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Incidence of Social Security Contributions: Evidence from France

Antoine Bozio, Thomas Breda and Julien Grenet*

*Paris School of Economics (PSE) and Institut des politiques publiques (IPP)

Workshop “Incidence and labour market effects of SSCs”

London, 1st March 2016