When Short-Time Work Works

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Summary

- Short-time work aims at preserving jobs in establishments facing temporary negative shocks.
- In response to the 2008-2009 Great Recession, short-time work has dramatically expanded.

We investigate the impact of short-time work on employment and survival of firms in 2009.

Main theoretical and empirical results:
- Short-time work saves jobs in firms with large drop in revenue.
- Short-time work only decreases hours of work in other firms.
- Short-time work is more effective at saving jobs than other subsidies.

Policy recommendations:
- Target at firms with large drop in revenue.
- Lower the threshold below which unworked hours are subsidized.
- Introduce experience rating.
Motivation

- Theoretical literature:
  - Short-time work is favorable to employment but distorts downwards the number of hours worked per employee.
  - Short-time work can be welfare-improving if firms have limited access to financial markets.

- Empirical literature:
  - Macroeconomic studies highlight positive employment effects.
  - Microeconomic analyses outline mixed effects.

- Our contribution:
  - Heterogenous effects depending on the size of the drop in revenue.
  - Richness of the data.
  - Instrumental variable method.
Legislation

- Rules prevailing from 2009 to 2011.

- Short-time work enables establishments
  - to decrease the number of hours worked of their employees
  - to maintain a payment for these unworked hours
  - to receive subsidies for these hours

- Payment:
  - Each unworked hour is paid 60% of the gross hourly wage ($\geq €6.84$).
  - The subsidy amounts to €3.33 or €3.84 (+/- 250 employees).

- Procedure:
  - Application from the establishment to the départementsal authorities.
  - Reply from the départementsal authorities.
  - In case of authorization, monthly consumption by the establishment within the limits set by the départementsal authorities.
Theoretical model

- Static directed search and matching model.
- Large number of workers and of multi-worker firms.
- Matching function between unemployed workers and vacant jobs.
- Each firm posts $v$ job vacancies, at cost $C(v)$.
- Preferences of workers $c - \phi(h)$.
- Hourly production $y = z \times \varepsilon$.
- Non-renegotiable labor contract $\{w(y), h(y), \Omega\}$.
- Public short-time compensation $\sigma \max(\bar{h} - h, 0)$.

→ Equilibrium contracts $\{w(y), h(y), \Omega\}$ satisfy:

1. Sharing rule $W - [b - \phi(0)] = \eta \Pi$
2. $\Omega = [\tilde{y}, \infty)$, where $\tilde{y}$ is the reservation productivity
3. $h(y)$ increasing with $y$
Productivity $y$ and hours worked $h(y)$ with (blue) and without (red) short-time work

- Short-time work implies
  - positive employment effect in firms with large drop in revenue
  - only drop in hours in firms with moderate drop in revenue
Theoretical findings (2)

Probability density function of productivity $y$

- Short-time work can increase the total number of hours worked if a sufficiently high proportion of firms has low productivity level.
Theoretical findings (3)

- Short-time work is more effective at saving jobs than other subsidies:
  - Short-time work targets more efficiently low-productivity jobs.
  - Short-time work only subsidizes non-worked hours.
  ⇒ Short-time work implies smaller windfall effects.

- Assuming an identical expenditure on short-time work and on other subsidies, short-time work enables to save a greater number of jobs.
Data

- **Sinapse-Chômage Partiel and Extranet-Activité Partielle:** Short-time work demands per establishment → characteristics of short-time work authorization and of monthly short-time work consumption.

- **DADS-Établissements:** Déclarations Annuelles des Données Sociales aggregated at the establishment level → siret, sector, characteristics of the workforce.

- **FICUS and FARE:** Financial data on all French firms → revenue, leverage rate.

- **SIENE, SIRENE and SIRUS:** General information about all French establishments → geocoding the location of establishments.

⇒ Focus on single-establishment firms which did not use short-time work neither in 2007 nor in 2008.
We estimate the following relation for the year 2009:

\[ L_i = \alpha_0 + STW_i \alpha_1 + Y_i \alpha_2 + X_i \alpha_3 + \varepsilon_i \]

- \( L_i \): Employment growth rate in the benchmark specification.
- \( STW_i \): = 1 if the firm uses short-time work.
- \( Y_i \): Revenue growth rate.
- \( X_i \): Past leverage, past hourly wage, past number of hours worked per worker, past turnover rate, past share of temporary jobs, past number of employees, age, (728) sector-specific fixed effects.
- \( \varepsilon_i \): Error term.
Simultaneity issue

- The revenue growth rate may be impacted by short-time work use.
- Short-time work use is potentially correlated with the error term:
  - Firms using more short-time work are also more likely to adjust hours and employment downwards when their revenue drops.
  - Other factors may influence the adjustment costs of employment and short-time work use for a given drop in revenue.
  → OLS short-time work estimate is potentially biased downwards.
Instrumental variables

- The behavior of single-establishment firms in 2009 that haven’t used short-time work in 2007-2008 is influenced by
  - the implementation of short-time work by the \textit{départemental} authorities → past response time to short-time work applications
  - the proximity of establishments belonging to multi-establishment firms and having already used short-time work → geographical distance to the closest one

⇒ We instrument short-time work use with these two variables.
Two-stage least squares

Finally, we estimate:

\[ L_i = \alpha_0 + STW_i \alpha_1 + Y_i \alpha_2 + X_i \alpha_3 + \epsilon_i \]

where:

\[ STW_i = \beta_0 + RP_i \beta_1 + DM_i \beta_2 + \bar{Y}_i \beta_3 + X_i \beta_4 + \eta_i \]

\[ Y_i = \gamma_0 + RP_i \gamma_1 + DM_i \gamma_2 + \bar{Y}_i \gamma_3 + X_i \gamma_4 + \zeta_i \]

- \( RP_i \): Share of response time \( > 14 \) workdays in 2008 in the \textit{département}.
- \( DM_i \): Distance to the closest establishment, belonging to a multi-establishment firm, which used short-time work in 2008.
- \( \bar{Y}_i \): Leave-one-out mean revenue growth rate of the (88) sector interacted with the mean revenue growth rate of the (328) commuting zone.
Empirical results (1)

- First-stage results.

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<tr>
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<th>Short-time work take-up</th>
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<tr>
<td>Response time</td>
<td>−.953***</td>
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<td>(.113)</td>
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<td>Distance to the closest establishment</td>
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<td>(.001)</td>
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- Global effects.

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<td>−.0216</td>
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<td>Employment growth</td>
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<td>.051</td>
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<td>(.003)</td>
<td>(.069)</td>
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Empirical results (2)

- Heterogenous effects: stratification using the predicted revenue growth rate.

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<tr>
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<td>-.326</td>
<td>-.352</td>
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<td>(.222)</td>
<td>(.253)</td>
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<td>(.145)</td>
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Empirical results (3)

- On average, each worker on short-time work in 2009 reduced her working time by 123 hours.
- Employers received €3.70 per subsidized non-worked hour, and hence €460 per worker on short-time work.
- Average annual labor cost amounts to €38,600.
- The cost of short-time work per job saved in 2009 amounts to €2,619.
- This cost is very small (6.8% of annual labor cost) compared with:
  - wage subsidies (100% to 200%)
  - hiring subsidies (25%)
- Every worker on short-time work in 2009 induced an increase in the total volume of hours of work equal to 10% of the average number of hours per job.
Conclusion

- Short-time work has been effective at saving jobs in 2009.

- However, short-time work:
  - deteriorates allocative efficiency
  - induces windfalls for firms and workers

- There are ways to enhance efficiency of short-time work:
  - Target at firms with large drop in revenue.
  - Lower the threshold below which unworked hours are subsidized.
  - Introduce experience rating:
    - Justification of short-time work: imperfect financial markets.
    - Recurrent short-time work is inefficient.
Sources: *DADS (INSEE)* and *Sinapse (DGEFP)*.
Scope: mainland France excluding Corsica; market sectors excluding agriculture; establishments using short-time work for economic reasons.