

# The Robustness and Real Consequences of Downward Nominal Wage Rigidity

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# Outline

1. Why is this important?

2. Previous Studies (in twenty seconds)

3. DNWR may be irrelevant

4. Low Growth: Switzerland in the 90s

5. Evidence on DNWR

- Evidence from personnel files
- Evidence from more representative data sets
- How to deal with measurement error?

6. Does DNWR reduce employment?

- Estimated wage sweep-ups are correlated with industry / local unemployment rate

7. Conclusion and Discussion

# Why is this important?

- Different reasons why wages may be downwardly rigid
  - Contracting Literature
    - US Approach: MacLeod and Malcomson (1993)
    - European Approach: Holden (1995, 200X)
  - Reciprocity and Loss Aversion
    - Perceived fairness of wage affects worker's effort; strong behavioral heterogeneity (Fehr and Gaechter, 2000)
    - Nominal wage serves as a reference point, influences fairness judgments (Shafir, Diamond and Tversky, 1997; Kahneman, Knetsch und Thaler, 1986, Akerlof, Dickens and Perry, 1996)
    - For a given real wage change, nominal wage cuts
      - Reduce perceived fairness by employees
      - Reduce reported satisfaction with pay / life.
- Strong macroeconomic implications
  - DNWR implies that monetary policy can have permanent real effects
    - Tobin; Akerlof, Dickens and Perry; Holden

# Previous Studies

## ▪ Interview Studies

- Bewley (1999): 236 manager's expected consequences of a nominal wage cut:
  - Morale lower: 69%
  - Productivity drops: 42%
  - Turnover increases: 41%
- Results also show that individuals care about real wage!

## ▪ Personnel Files

- Baker, Gibbs and Holmström (1994), Wilson (1999)
  - Real wage cuts occur quite often
  - But nominal wage cuts are very rare

## ▪ Labor Force Surveys

- Find some / strong evidence for downward nominal wage rigidity
  - McLaughlin (1994), Smith (1999), Kahn (1997), Card and Hyslop (1996), Lebow, Saks and Wilson, (1999) Altonji and Devereux (1999) and others.

# Does DNWR really matter?

- Conjecture

- High average wage growth in sample period
  - Average wage growth was at least 3.4 percent.
- Nominal Rigidities would fade if average wage growth were low enough. (Gordon, 1996; *The Economist*, 1999; King, 1999)

- Downward nominal wage rigidity may be largely irrelevant

- Ineffective at high levels of nominal growth
- Vanishing at low levels of nominal growth

- Suggestive Evidence

- Lebow, Saks and Wilson (1999): US in the 1990s
- Find significant effects on average wage changes at micro level
- Unrelated to unemployment rate.
- „Micro-Macro Puzzle“

# Low Growth: Switzerland 1991 - 1997

## ■ Macroeconomic Conditions

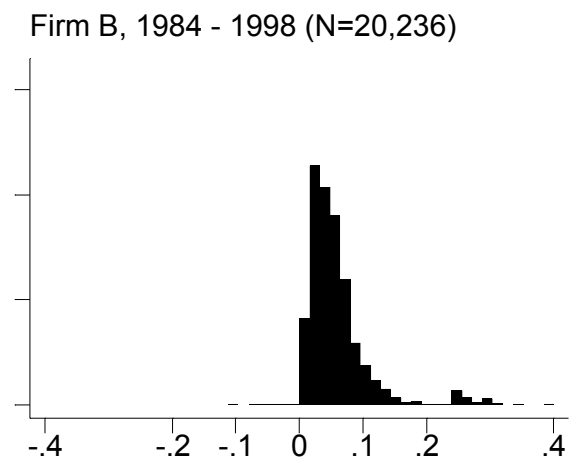
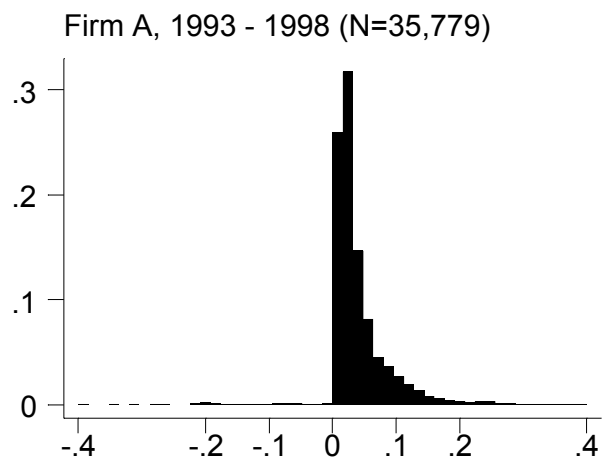
- Average wage growth sharply falling (7% → 1.5 %), remains very low for four years.
- Is this because wage cuts occur or because there is a growing number of wage freezes?
- Sharp Increase in Unemployment (.5% → 5%)
- Can some of the development in unemployment be attributed to DNWR?

## ■ Labor Market Institutions

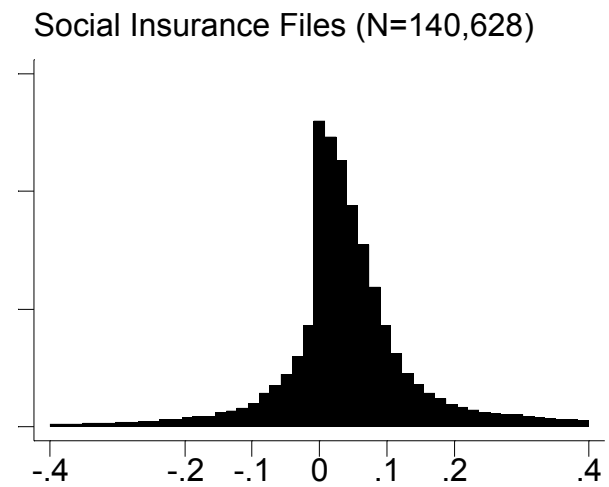
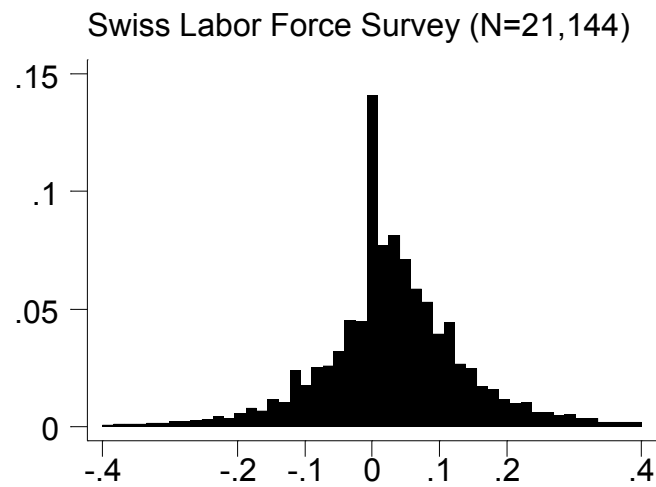
- Non-waivable employer right: Threaten to dismiss a worker, unless he agrees to new contract.
- Also applies to collective wage bargaining.
- Rules out 'contractual' downward rigidity and bargaining under hold-out.
- Indirectly sheds light on the relevance of reciprocity and loss aversion in the labor market.

# Summary and Conclusions

- Downward nominal wage rigidity is a robust phenomenon
  - Persists after a long period of low nominal growth.
  - Likely to have caused unemployment
  - DNWR does not seem to erode, even if nominal wage growth gets very low
  - New model considerably improves fit to the data, by (i) allowing for measurement error, and (ii) heterogeneity of extent of DNWR.
- I am not convinced that this approach will work in every country and every time period.
  - How well does our econometric model approximate the observed distribution of nominal wage changes?
    - Generates a distribution that looks quite similar to the observed distribution in low-inflation years.
    - But fails quite miserably in higher-inflation years.
    - In general, data from labor force survey presents a problem for this model.



Evidence from Personnel Files  
Figure 1: Distribution of Nominal Wage Changes



Evidence from Representative Samples, Switzerland 1991 - 1997  
Figure 2: Distribution of Nominal Wage Changes

## An Econometric Model of DNWR

- **Notional (nominal) wage change** of individual  $i$  is given by

$$(i) \quad dw^*_{it} = x_{it}b + e_{it}$$

- **Small wage cuts are unprofitable for firms.** There is a **threshold  $c_{it}$**  after which firms cut nominal wages. Threshold varies between individuals (and over time). Its distribution will be estimated from the data.

- **Downward nominal Wage Rigidity.** Firm prefers a wage freeze ( $dw_{it} = 0$ ) if

$$(ii) \quad -c_{it} < dw^*_{it} < 0$$

- **Wage Cuts.** Firm will cut nominal wage if

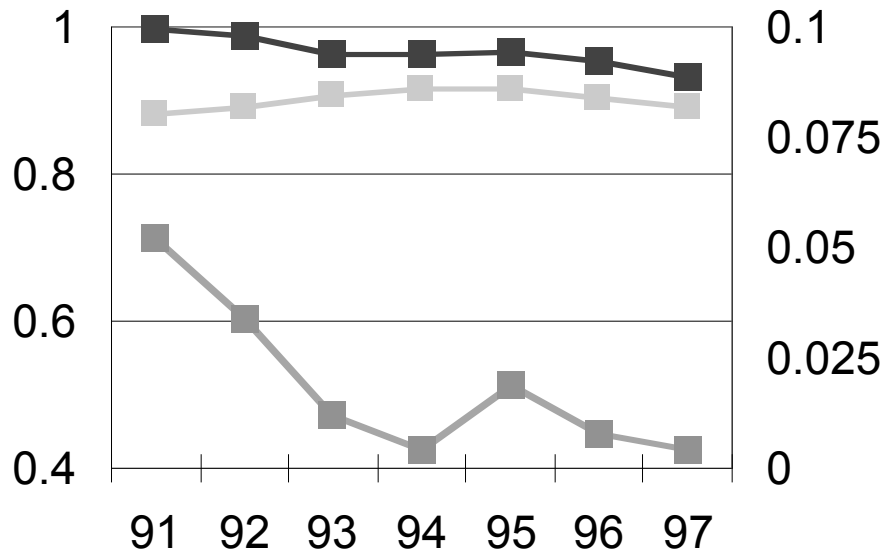
$$(iii) \quad dw^*_{it} < -c_{it}$$

- **Observed Nominal Wage Changes** may be polluted by measurement error.

$$(iv) \quad dy_{it} = dw_{it} + m_{it}$$

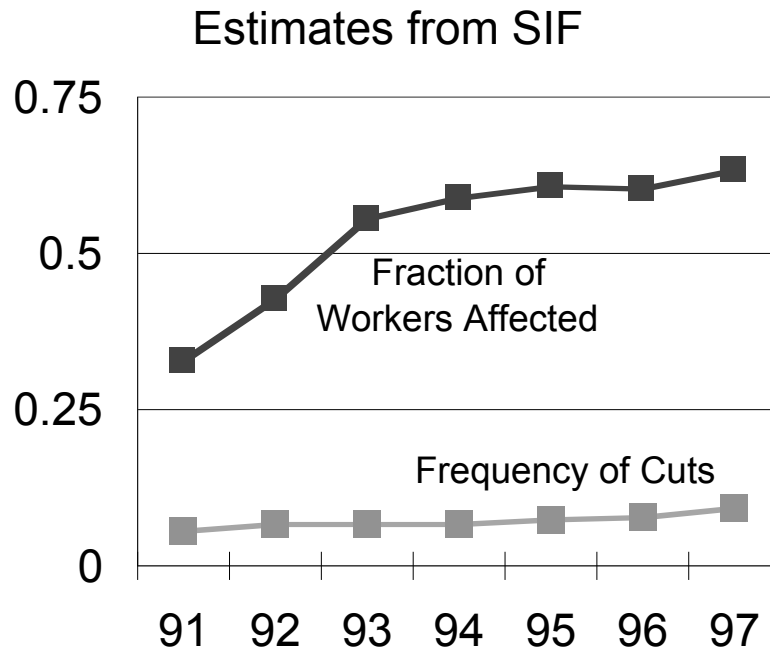
- **Estimation by ML:** determinant of  $dw^*_{it}$ , distribution of  $c_{it}$ , distribution of  $m_{it}$ .
  
- **Nice Features** of this model
  - Allows a simple form of heterogeneity between workers.
  - Small wage cuts are less frequent than large wage cuts.
  - Allows us to investigate how DNWR is different for different categories of workers (job stayers vs. job movers / part-time vs. full-time workers)
  - Allows us to investigate if and how DNWR changes as the macroeconomic environment changes
  
- **Empirical Implications**
  - Frequency of wage freeze  $\Pr(-c_{it} < dw^*_{it} < 0)$
  - Frequency of wage cut  $\Pr(dw^*_{it} < -c_{it})$
  - Wage “Sweep-up” due to downward nominal wage rigidity  $E(dw_{it} - dw^*_{it})$

**Panel (b): Inflation Rate and Resistance against Wage Cuts**  
 Estimates from SIF



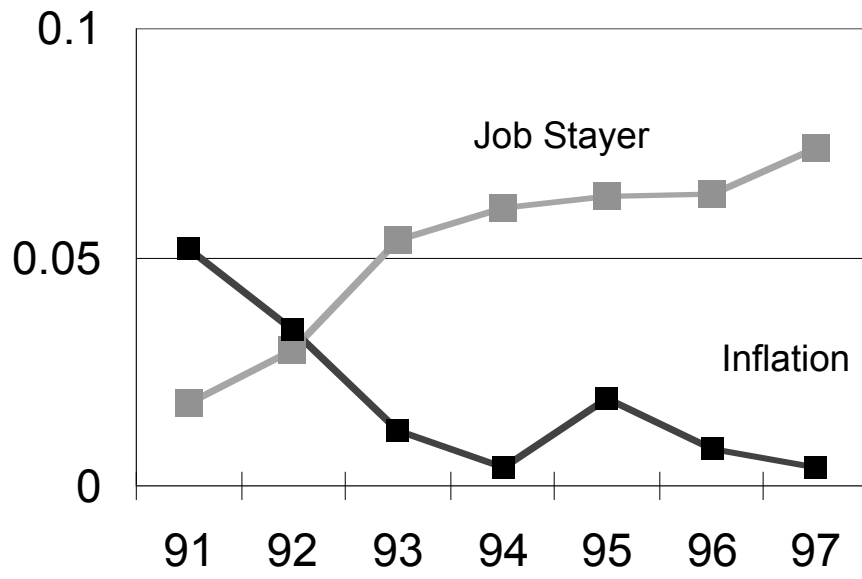
- Fraction with  $c > 0$
- Fraction with  $c > .1$
- Inflation (Dec to Dec)

## Panel (d): The Extent of Nominal Wage Rigidities over Time



# Panel (f): Average Prevented Real Wage Cut

Estimates from SIF



**THE REAL EFFECTS OF DOWNWARD NOMINAL WAGE RIGIDITY**

**OLS REGRESSIONS  
DEPENDENT VARIABLE: UNEMPLOYMENT RATE**

	<b>A. Unemployment in 17 Cantons</b>			
$E_{jt} (\Delta w \Delta w^*)$	1.17*** (0.10)	1.11*** (0.09)	2.24*** (0.88)	1.69*** (0.44)
$R^2$	0.49	0.90	0.56	0.95
Cantonal Fixed Effects	No	Yes	No	Yes
Year Fixed Effects	No	No	Yes	Yes

	<b>B. Unemployment in 16 Industries</b>			
$E_{jt} (\Delta w \Delta w^*)$	0.98*** (0.19)	0.91*** (0.17)	1.90*** (0.65)	1.69*** (0.56)
$R^2$	0.27	0.85	0.33	0.89
Industry Fixed Effects	No	Yes	No	Yes
Year Fixed Effects	No	No	Yes	Yes

Standard errors, adjusted for clustering on cantons or industry respectively, in parentheses.