Flexible wages, employment and efficiency

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February 13, 2019

Motivation

Flexible (variable) wage components have a large share in worker compensation

- Approximately half of the workers receive flexible wage components (Bloom, van Reenen; 2011)
- Flexible components contribute to wage inequality (Lemieux et al. 2009)

How does wage structure affects firms' perfomance?
What does explain the heterogeneity in wage structure?

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Flexible wages are usually considered as a tool of **incentive contracts** (Holmström 1979, Lemieux et al. 2009)

Does downward flexibility also protect jobs (Tobin 1972; Weitzman 1983, 1987)?

Only limited empirical evidence on the employment effects of flexible wages

- databases are rare which contain information on
  1. balance sheet of the firm
  2. individual level wage schemes
  3. job history of workers

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Main findings

1. Firms with flexible wages are larger, more productive, and have less volatile growth rate
2. Flexible components are more reactive to **firm level revenue changes**
3. **Firms with and without flexible wages have the same employment reactions**
   - if the revenue drops
   - during the Great Recession

Interpretation:

1. Flexible wage components are unlikely to protect jobs if revenue drops
2. Results are **consistent with a wage posting model with incentive contracts**

Outline

Related Literature

Incentive effects of flexible wages

- theoretical models: Holmström (1979, 1982), Levin (2003)
- field experiments: Lazear (2000); Shearer (2004), Bandiera et al (2007)
- This paper estimates the effect of flexible wages using observational data

Employment cost of wage rigidity

- Worker with flexible wages have longer tenure in crisis
- Lemieux et al. (2012) Stokes et al. (2014); Pischke (2016)
- This paper shows that flexible wages always induce longer tenure

Related Literature

Flexibility of variable componentes

- variable wage components are more responsive to aggregate shocks than the wage base
- Oyer (2005); Messina et al. (2010); Anger (2011), Lemieux (2012)
- This paper shows that variable components react more on firm level idiosyncratic shocks

Wage posting models with productivity shocks

- papers focus on separation rates and wage dynamics but not on wage structure
- Postel-Vinay, Turon (2010); Robin (2011); Moscarini, Postel-Vinay (2013); Bagger et al. (2014); Jarosch (2014); Pinheiro, Visschers (2015)
- This paper endogenizes wage structure

Outline

Institutional background

Hungarian firms adjust base wage every 13.8 months and **80 per cent of firms adjust wages once a year** (Kézdi, Kónya 2011; Durant et. al., 2012)

- Share of flexible components approximately 10%

Employment protection **institutions are similar to Anglo-Saxon countries** (Riboud et. al. 2002)

- Share of union members is approximately 20 percent
- wage bargaining is on individual level, workers can be dismissed relatively easily (Tonin, 2009)

Stable economic growth before 2008, inflation moderately low (0-5%) (→link)

Outline

Data

- Linked employer-employee database - **Hungarian Structure of Earnings Survey**
  - Every firm having more than 20 employees and a random sample of firms between 5 and 20 employees
  - Firms report the **composition of individual wages** paid in May
- **Corporate Tax Data** on the **balance sheet** and income statement
- private sector only, years between 2001-2014

Definition of flexible payments

	share of workers receiving the wage element	share of wage parts conditional on receiving		
		mean	p25	p75
overtime payments	0.202	0.105	0.047	0.141
monthly bonuses and premia	0.210	0.216	0.078	0.300
occasional bonuses	0.440	0.085	0.033	0.112
allowances	0.387	0.124	0.054	0.175
reimbursements	0.368	0.054	0.020	0.061
total	0.778	0.221	0.082	0.312

Worker level: somebody received flex. elements at least once (Lemieux et al. 2009)
Firm level: share of workers received flexible wage components

Empirical strategy - Determinants of flex. wages

First stage: Estimation of variance (similarly to Wald, 1980)

$$\Delta log(sales_{jt}) = \lambda_0 + \lambda_1 X_{jt-1} + \varepsilon_{jt} \quad (1)$$

- Proxy of variance: $\widehat{\varepsilon_{jt}^2}$

Second stage:

$$flex_{jt} = \lambda_0 + \lambda_1 \widehat{\varepsilon_{jt}^2} + \lambda X_{jt} + \nu_{jt} \quad (2)$$

- $\Delta log(sales_{jit})$ is the change of net sales
- $flex_j$ measure of wage flexibility
- X_{jit-1} denote the controls

Empirical strategy - Adjustments to shocks

Pooled first difference estimations for wage changes

$$\Delta y_{jt} = \beta_1 \Delta log(sales_{jt}) + \beta_2 flex_{jt-1} + \beta_3 flex_{jt-1} * \Delta log(sales_{jt}) + \gamma X_{j,t-1} + \mu_t + \varepsilon_{it}$$

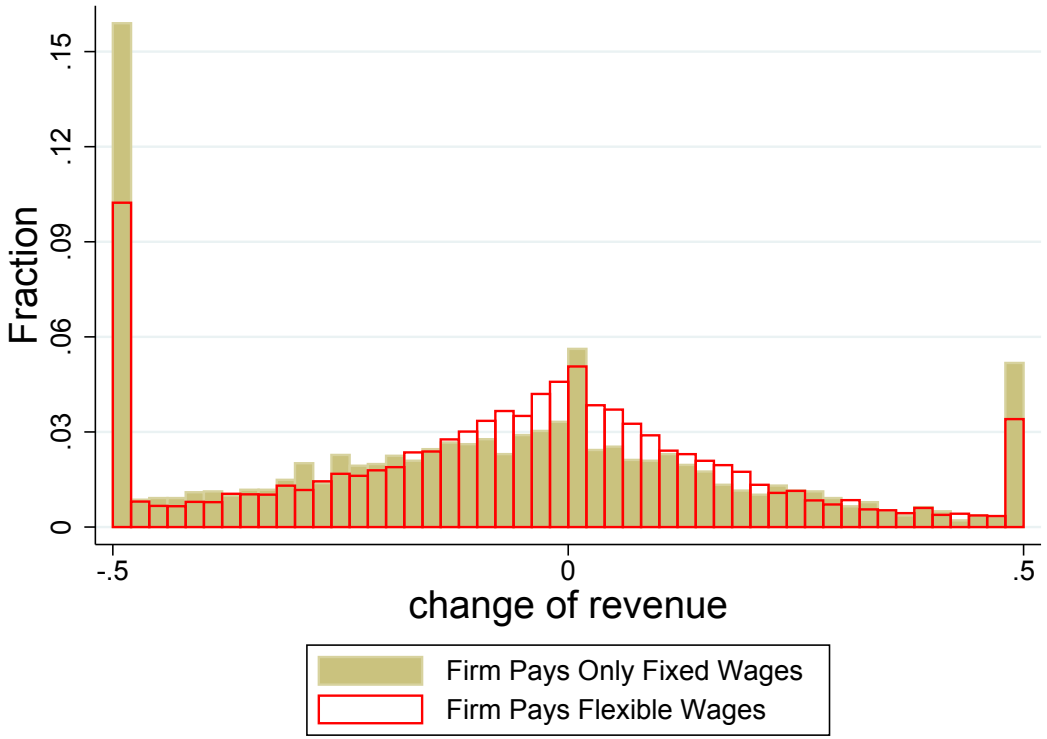
- Dependent variable is the **change of wages and employment** at firm j between year $t-1$ and t
- $\Delta log(sales_{jt})$ is the change of net sales
- $flex_{jt-1}$ share of worker with flex. wage
- $X_{j,t-1}$ denote the controls

Threats to identification

1. Firms absorb small and temporary shocks
   - The shocks during the Criris were large and permanent
2. The revenue shocks are correlated with wage structure during the Crisis
   - I instrument the the revenue with proxies of product demand

Adjustment during Crisis

The Crisis hit firms with flexible wages less severely



Adjustment during Crisis (2)

I instrument the the revenue with proxies of product demand

- Growth of import in 4 digit industry
- Growth of export markets (Hummels et al. 2013)

First stage:

$$\Delta log(sales_{jt}) =$$
$$\alpha_1 flex_{jt-1} + \alpha_2 * \Delta log(import_{jt}) + \alpha_3 * \Delta log(export\_market_{jt}) + \alpha_4 * X_{jt} + u_t + \epsilon_{jt}$$

Second stage

$$\Delta y_{jt} = \beta_1 \Delta \widehat{log(sales_{jt})} + \beta_2 flex_{jt-1} + \beta_3 flex_{jt-1} * \Delta \widehat{log(sales_{jt})} + \beta X_{j,t-1} + \mu_t + \varepsilon_{it}$$

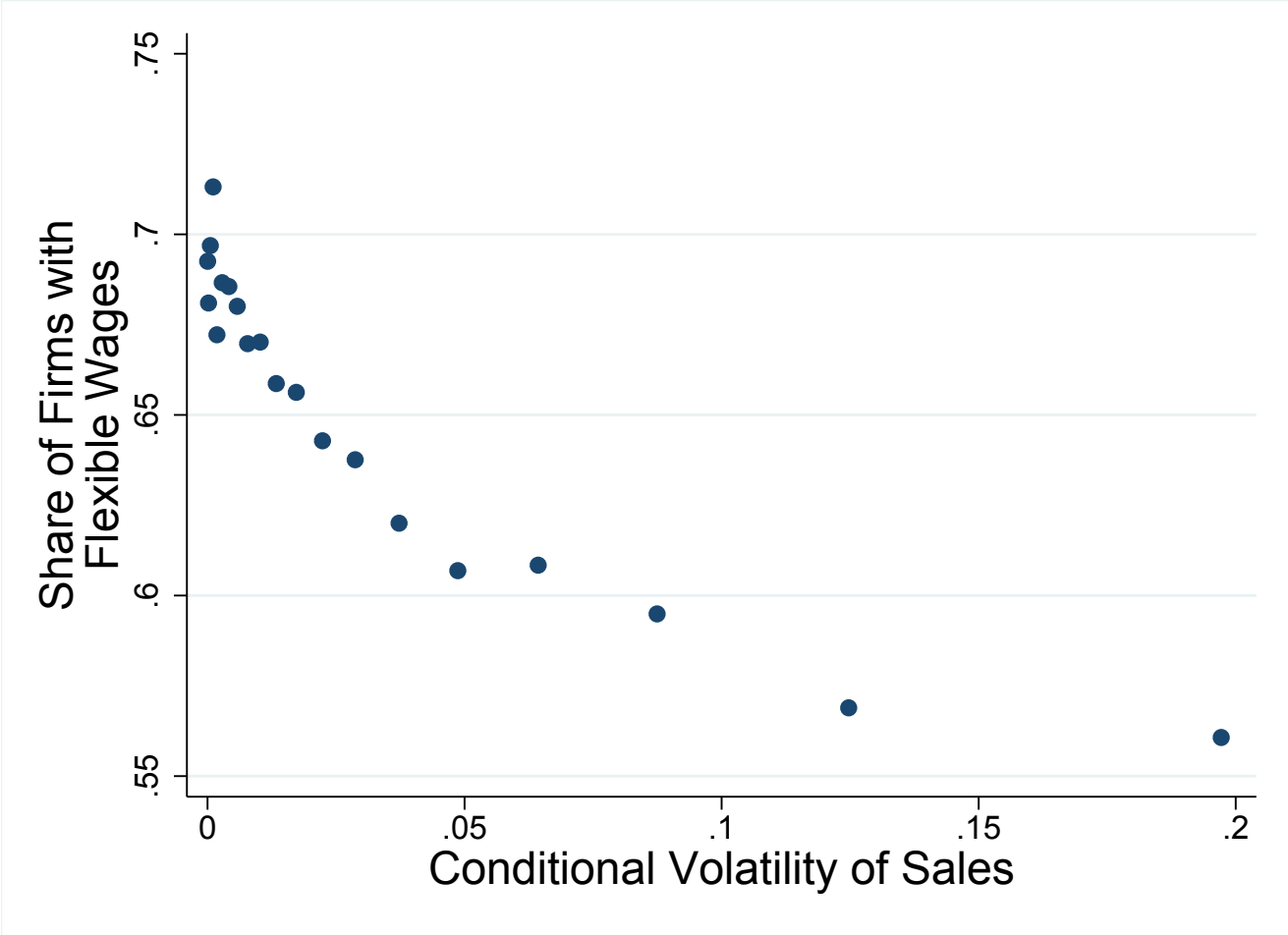
I bootstrap the standard errors

Outline

Volatility of sales

	Share of workers with flex. wages	flex. components/ total wage	firm payed any flex. component
Value added / worker (log)	0.045	0.066	0.036
	(0.003)***	(0.005)***	(0.003)***
Capital / worker (log)	-0.002	-0.004	-0.001
	(0.002)	(0.003)	(0.002)
Employment (log)	0.097	0.103	0.087
	(0.003)***	(0.005)***	(0.003)***
Volatility of growth	**-0.278**	**-0.277**	**-0.237**
	(0.037)* **	**(0.053)*** **	**(0.039)*** **
Growth rate	-0.007	0.028	-0.01
	(0.009)	(0.013)***	(0.009)
Additional controls	Yes	Yes	Yes
Observations	49.139	49.139	49.139

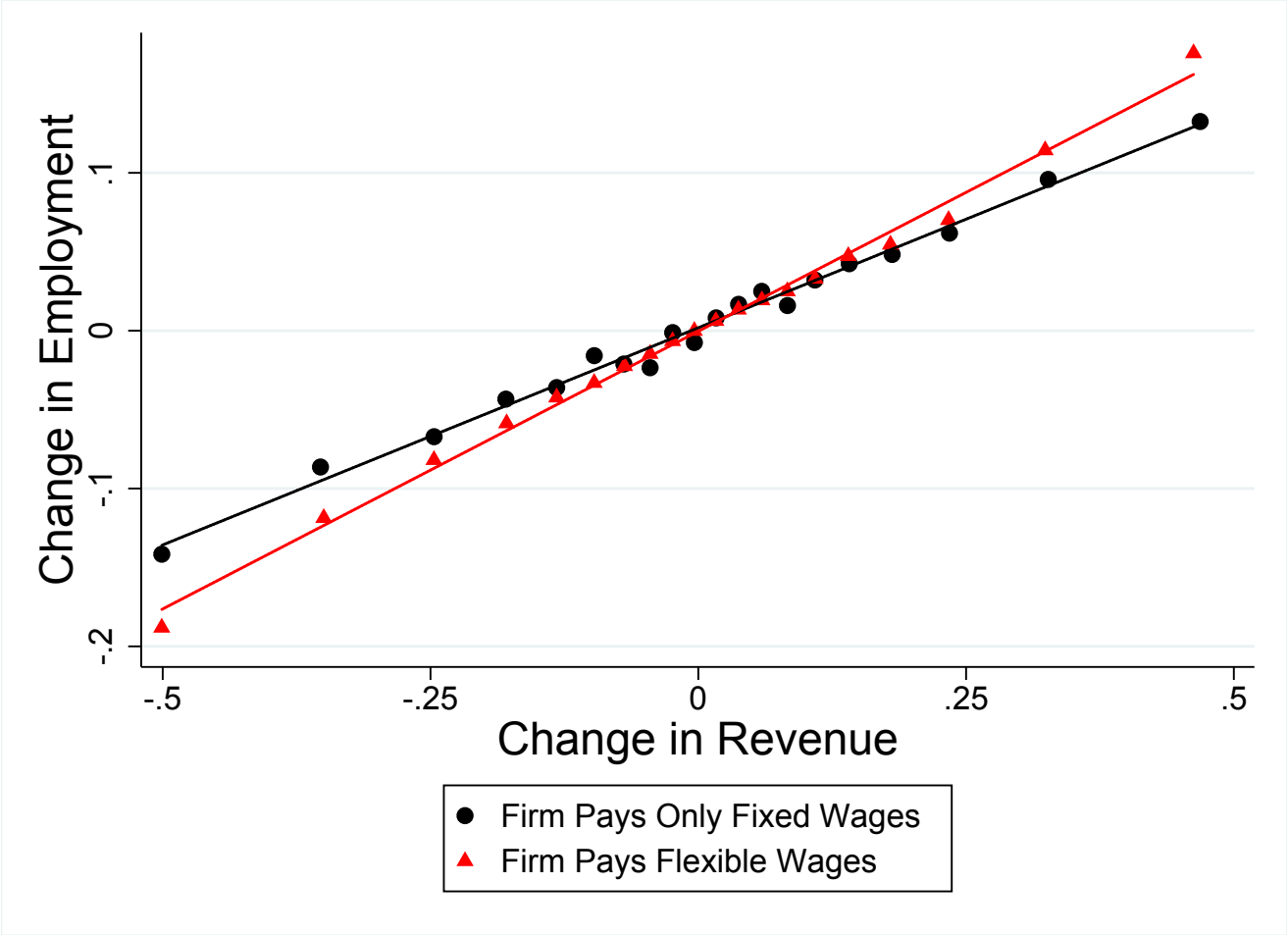
Wage flexibility and the volatility of growth



Outline

Revenue shocks and wage adjustment

Revenue shocks and employment changes



Revenue shocks and separations

Outline

Firm adjustment during the Crisis

	wages		employment		separations	
	OLS	IV	OLS	IV	OLS	IV
share flex. wage	-0.016***	-0.075	-0.007	0.348***	-0.052***	0.043
	(0.002)	(0.156)	(0.007)	(0.14)	(0.007)	(0.144)
change in sales	0.007	-0.075	0.315***	0.348***	-0.030	0.043
	(0.005)	(0.156)	(0.024)	(0.14)	(0.020)	(0.144)
interaction	0.033***	0.221*	0.028	0.068	-0.013	-0.128
	(0.007)	(0.118)	(0.029)	(0.12)	(0.024)	(0.111)
year fe.	x	x	x	x	x	x
firm controls	x	x	x	x	x	x
worker controls	x	x	x	x	x	x
Observations	8,534	4,513	8,482	4,205	8,482	4,205
R-squared	0.047		0.316		0.135	

MTA KRTK KTI

Robustness checks

- Changing the definition of bonus payments ($\rightarrow$ link)
- Different sample definition ($\rightarrow$ link)
- Results are similar in different sub-samples
- Individual level estimations ($\rightarrow$ link)

Outline

Theoretical Framework

- The choice of flexible wage structure may have multiple confounders
- The empirical findings are in line with a **wage posting model with incentive contracts**
  - According to the model worker with flexible wages have longer tenure in case of negative revenue shocks even if firms do not have financial constraints

Overview of the model (1)

- develop a discrete **wage posting model** á la Manning (2003, 2004)
  - worker-level revenue shocks,
  - **firms differ in the volatility of revenue shocks** Sutton (2002); Kramarz et al. (2015)
- **workers**
  - are identical and risk averse
  - have hidden effort level
- **flexible payments in the model**:
  - Firms can offer linear contracts to enhance higher effort

(→details)

Overview of the model (2)

1. Firms with low volatility of revenue offer incentive contracts and turn to be more productive
2. In a wage posting setup more productive firms
   - offer higher wages
   - attract some workers from less productive firms
3. Firms with flexible wages have lower turnover
4. The employment and revenue changes is caused by idiosincratic productivity and employment shocks
   - Firms with and without flexible wages have the same employment reaction to revenue changes

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Summary

Firms with flexible wage structure

- are larger, more productive and have less volatile growth rate
- adjust wages more to revenue shocks but do not smooth employment more

The results are consistent with a wage posting model with incentive contracting

Thank you for attention!