

Do Sticky Wages Matter? New Evidence from Matched Firm-Survey and Register Data

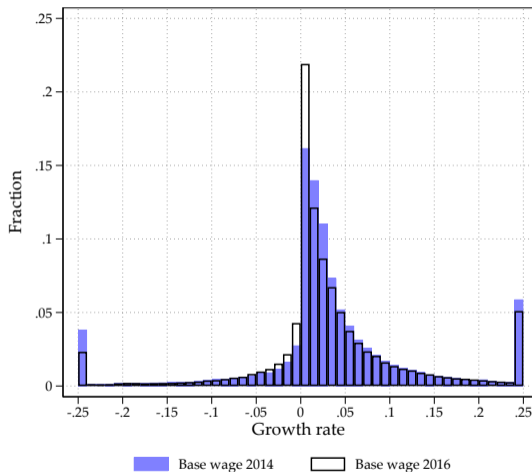
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Wages rise more often than they fall



Notes: Biennial wage growth distribution in Switzerland 2012-2016. The base wage excludes irregular payments (e.g. bonuses)

Questions: Do rigid wages have a negative causal impact on income and employment after a contractionary monetary policy shock?

Contribution: Causal effect of **base wage** rigidity on real outcomes at the **worker level**, in a **deflationary environment**, after an **unexpected deflationary shock** on the **aggregate economy**

Identification strategy: Define treatment (workers with wage freezes) and a control group (workers with small wage cuts) and compare employment outcomes after the unexpected removal of exchange rate floor policy in 2015

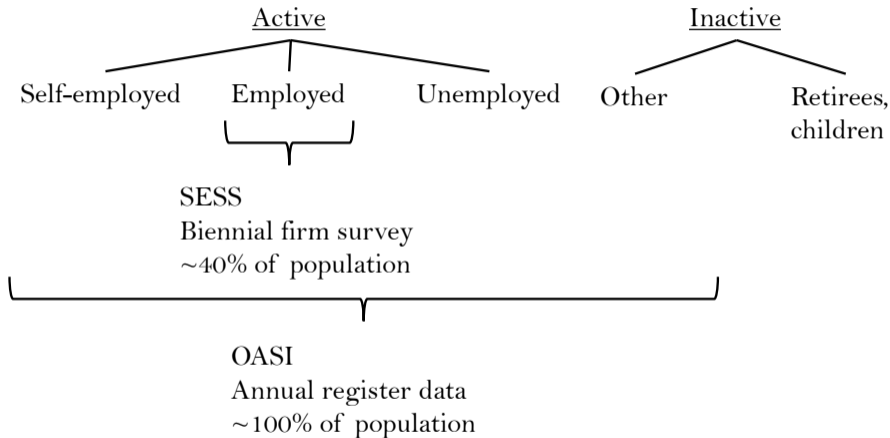
Main finding: After a 1% deflationary shock, base wage rigidities cause a decline of aggregate income (-0.3%) and employment income (-0.9%), as well as an increase of the number of unemployed individuals (1.3%).

1. Data

2. Identification and estimation

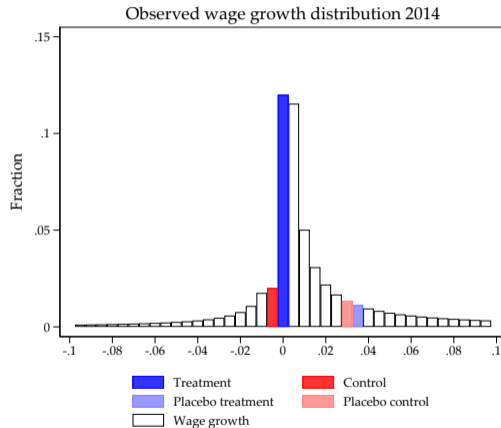
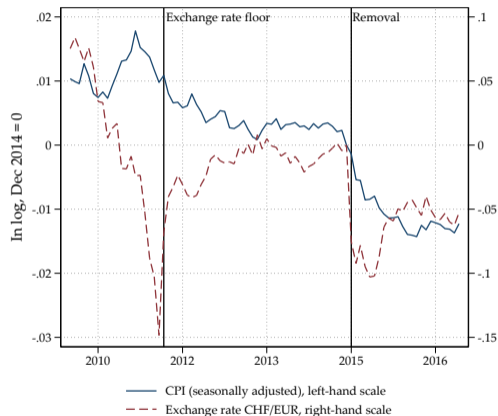
3. Main results

4. Concluding Remarks



Notes: The braces indicate the population of the firm survey (SESS) and the social security register data (OASI), respectively. Source: Swiss Federal Statistical Office and Central Compensation Office.

	Swiss Earnings Structure Survey (SESS)	Old Age and Survivors' Insurance (OASI)
Purpose	Measure wage rigidities (zero wage changes - treatment), worker and firm characteristics	Track income and employment history (outcome variables), construct sampling weights
Time	2012, 2014, 2016	2008 - 2016
Population	Swiss employees (1.6 mio each wave)	Working age population (5 mio each year)
Content	Socio-economic, firm and contract characteristics, activity rate and income (base, irregular and 13th month income)	Income from social security insurance (especially unemployment benefits and zero employment income)
Definitions	We normalize income to the activity rate in 2014 to measure the contractual wage	Total, employment, unemployment income and unemployment indicator
Weights	Non-random sample: Stratified firm-survey, wage freeze indicator requires two consecutive observations	Construct own sampling weights using a Probit model



$$y_{i,t} = \sum_{j \neq 2014} \mathbf{1}\{t = j\} \times \left[\alpha_j \mathbf{1}\{\Delta w_{i,2014} = 0\} + \delta_j \mathbf{1}\{\Delta w_{i,2014} < -c\} + \gamma_j \mathbf{1}\{\Delta w_{i,2014} > 0\} \right] + \sum_{j \neq 2014} \mathbf{1}\{t = j\} \times \left[\mathbf{x}_{i,2014} \beta + \mathbf{z}_{t,2014} \theta \right] + \theta_i + \varepsilon_{i,t} .$$

- $y_{i,t}$: total income, employment income, unemployment income, unemployment dummy (OASI data)
- $\mathbf{1}\{A\}$: Indicator variable that equals 1 if the condition A is true and 0 otherwise
- We interact time dummies with a wage freeze dummy ($\mathbf{1}\{\Delta w_{i,2014} = 0\}$), dummies for large wage cuts ($\mathbf{1}\{\Delta w_{i,2014} < -c\}$), dummies for wage increases ($\mathbf{1}\{\Delta w_{i,2014} > 0\}$)
- θ_i : Individual fixed effects, capture time constant unobserved characteristics
- ε_{it} : denotes an i.i.d. error term, standard errors are clustered at unique values of the base wage growth distribution.

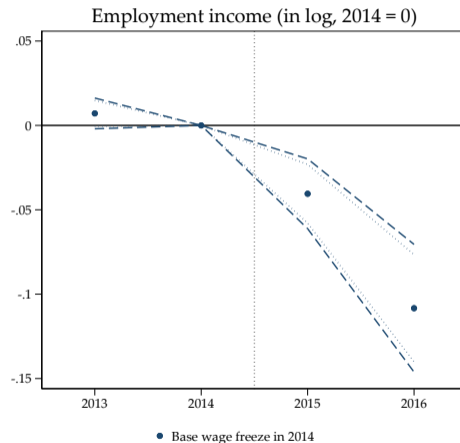
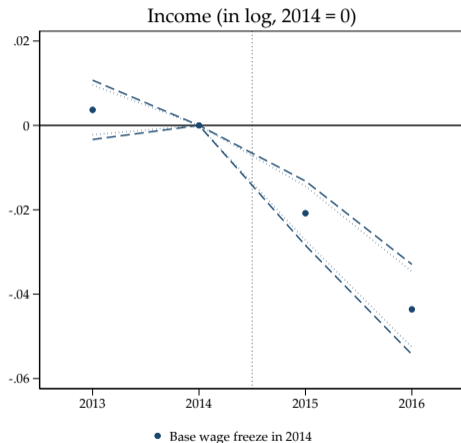
Two matrices of control variables capture observed differences that may affect selection into treatment at the individual and firm-level ($\mathbf{X}_{i,2014}$, $\mathbf{Z}_{f,2014}$).

$\mathbf{X}_{i,2014}$

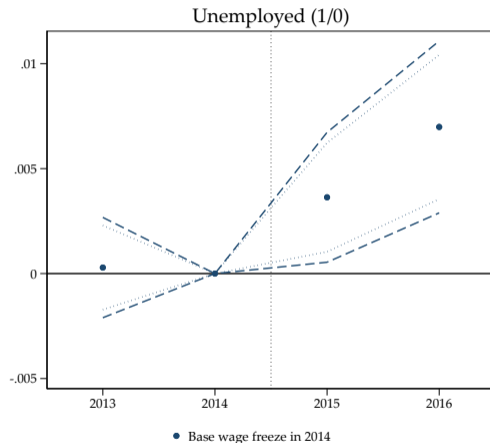
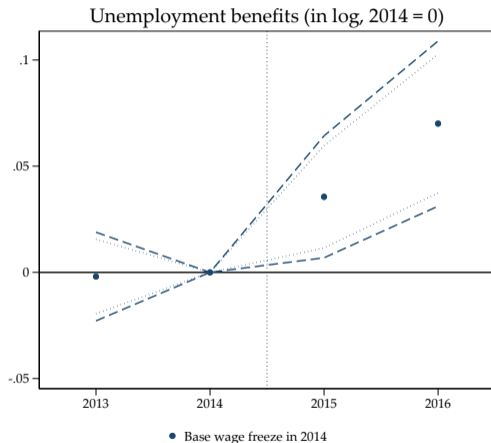
- Contract (e.g. temporary contract) and job type (e.g. management function)
- Education (e.g. tertiary education)
- Gender
- Unemployed (2012-2014)
- Job mover (2012-2014)

$\mathbf{Z}_{f,2014}$

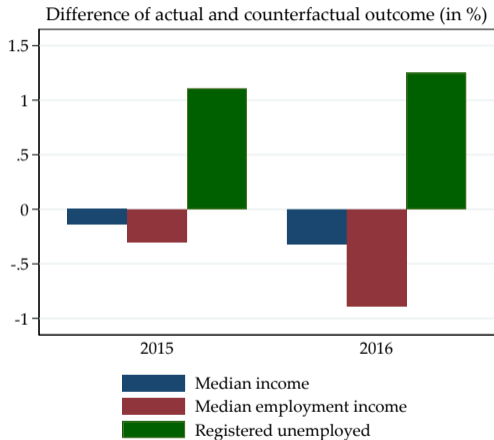
- Firm dummies (firm-level time effects)



Notes: 90% and 95% confidence intervals based on standard errors clustered according to the wage growth distribution in 2014 (Lee and Card, 2008).



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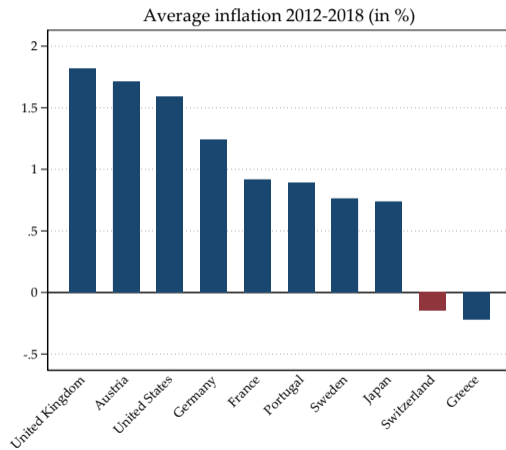
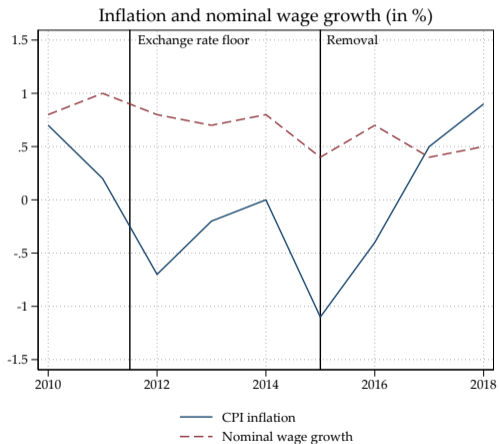


Notes: The graph shows the aggregate effects of wage rigidity on median income, employment income, and registered unemployment. The predictions are evaluated at the actual model coefficients (Prediction). The counterfactual predictions set the treatment dummies to 0 (Counterfactual). All statistics are computed at the individual level and then aggregated using own sampling weights.

We use Swiss wage data matched with social security data to measure nominal wage rigidity and identify its causal effect on income, employment, and unemployment after a deflationary shock:

- Downward nominal wage rigidity is a **pervasive feature** of the Swiss labor market, even during deflation
- Even though rigidities bind only for a modest share of workers, effects on income and unemployment are **economically relevant**
- Results are robust to i.e. a misclassification bias, placebo test, other outcomes and samples, different control variables, different definitions of control/treatment group, export/import intensity
- Implications for **monetary policy**: Nominal rigidities are an important factor to determine inflation target

Appendix



Monetary Policy

Justification for **positive inflation target**

(Tobin, 1972, Bernanke, 2003, Issing et al., 2003)

Key friction in **macro models** (Erceg

et al., 2000, Schmitt-Grohé and Uribe, 2013,

Schmitt-Grohé and Uribe, 2016, Born et al., 2019)

Uneven staggering of wage settings explain different **monetary policy transmission**

(Olivei and Tenreyro, 2010, 2007)

Allocative effects

Inefficient distortions **remain debated**

(Barro, 1977, Issing et al., 2003, Elsby, 2009, Basu and House, 2016, Elsby and Solon, 2019, Grigsby et al., 2021)

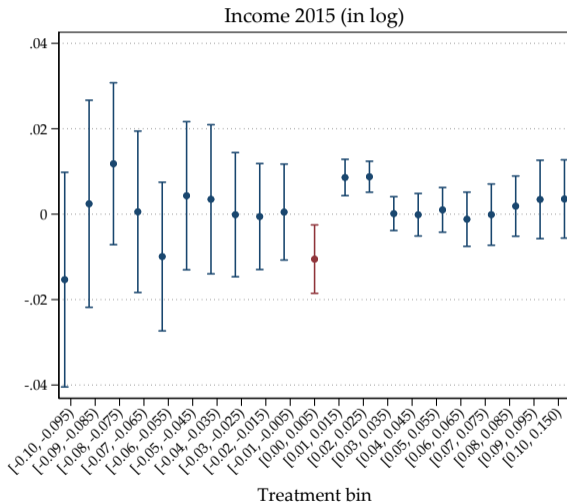
Correlated with unemployment across

regions or firms (Fehr and Goette, 2005,

Bauer et al., 2007, Kurmann and McEntarfer, 2019)

Impact depends on the **nature of the economic shock**

(Eichengreen and Sachs, 1985, Sumner and Silver, 1989, Basu and Taylor, 1999)



Notes: Placebo treatments in different bins of the base wage growth distribution in 2014. The bin including wage freezes is highlighted in red. The bars represent 95% confidence intervals.

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