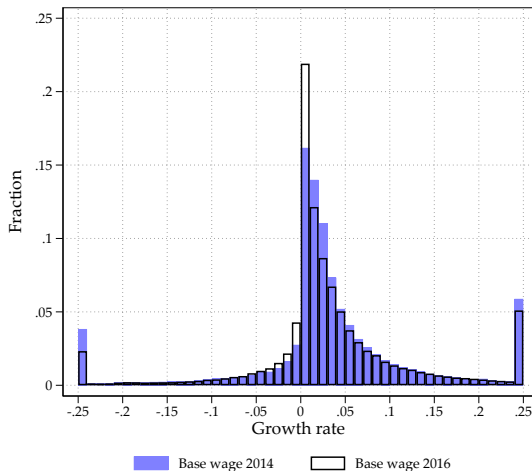# Do Sticky Wages Matter? New Evidence from Matched Firm-Survey and Register Data

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

Main questions:

- Do rigid base wages have a negative **causal impact** on income and employment after a contractionary monetary policy shock?

- Do **bonus payments** mitigate the adverse allocative effects of downward rigid base wages?

Identification strategy:

– **Diff-in-Diff**: Compare employment outcomes for treatment (workers with wage freezes) and control group (workers with small wage cuts) after the unexpected removal of exchange rate floor policy in 2015

Contribution:

– Causal effect of **base wage rigidity** and **bonus payments** on income and employment at the **worker level**, in a **deflationary environment**, after an **unexpected deflationary shock**

Main finding:

– After a 1% deflationary shock, base wage rigidities cause a decline of income (-4.4%) and employment income (-11%), as well as an increase increase of the likelihood of becoming unemployed ($0.7ppt$), compared to the treatment group

– Bonus payments **mitigate**, but do not completely offset these adverse effects

1. Data

2. Identification and estimation

3. Allocative effects of rigid base wages

4. Mitigating effects of bonus payments

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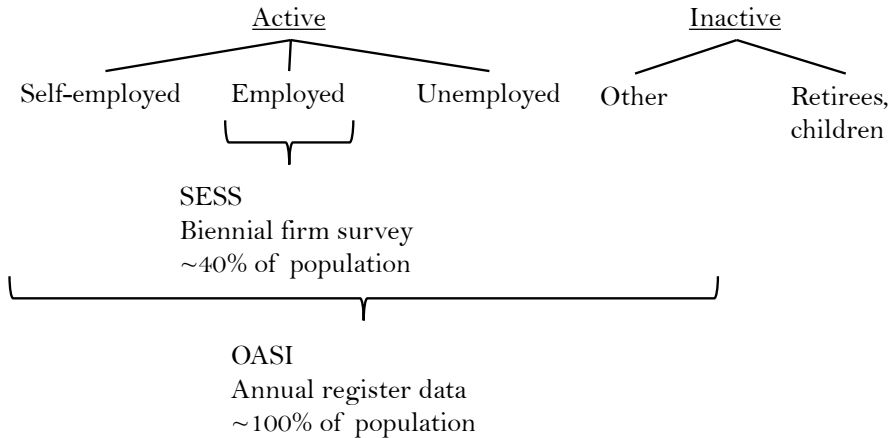
Notes: The braces indicate the population of the firm survey (SESS) and the social security register data (OASI), respectively. Source: Swiss Federal Statistical Office and Central Compensation Office.

	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

Observed wage growth distribution 2014
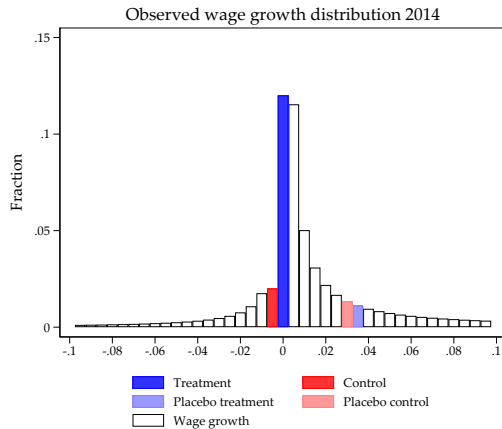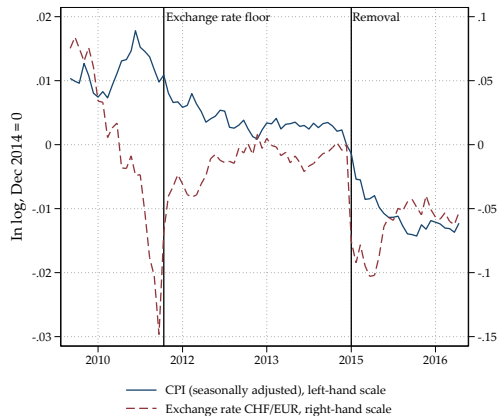
$$
\begin{aligned}
y_{i,t} &= \sum_{j \notin 2014} \mathbf{1}\{t = j\} \times \Big[\alpha_j \mathbf{1}\{\Delta w_{i,2014} = 0\} + \delta_j \mathbf{1}\{\Delta w_{i,2014} < -c\} + \gamma_j \mathbf{1}\{\Delta w_{i,2014} > 0\}\Big] \\
&+ \sum_{j \notin 2014} \mathbf{1}\{t = j\} \times \Big[\mathbf{X}_{i,2014}\beta + \mathbf{Z}_{f,2014}\theta\Big] + \theta_i + \varepsilon_{i,t}.
\end{aligned}
$$

– $y_{i,t}$: 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.
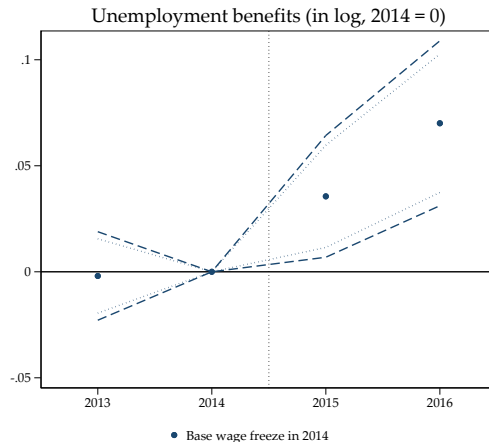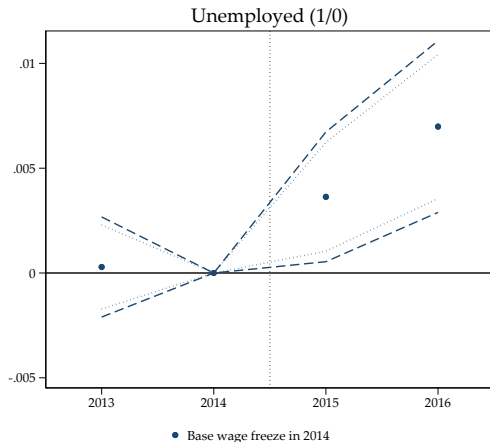
Control variables

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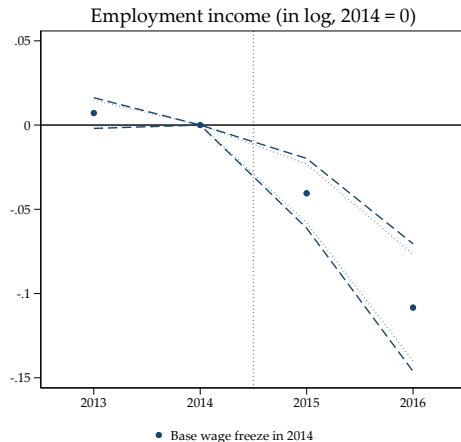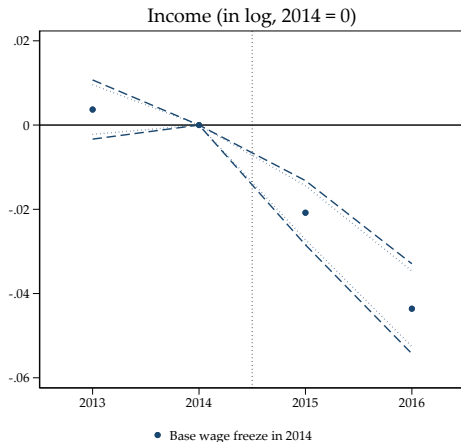
$\mathbf{X}_{i,2014}$

– 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)

Unemployed (1/0) — Unemployment benefits (in log, 2014 = 0)

• Base wage freeze in 2014 — • Base wage freeze in 2014

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

Income (in log, 2014 = 0) • Base wage freeze in 2014

Employment income (in log, 2014 = 0) • Base wage freeze in 2014

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

	(1) Share zero wage change	(2) Share negative wage change	(3) Share non-zero wage level	(4) Avg. share in total wage	(5) Avg. share in firms' payroll
Base	0.08	0.21	1.00	0.91	0.90
13th month	0.06	0.35	0.78	0.06	0.06
Bonus	0.03	0.59	0.32	0.02	0.03
Overtime	0.01	0.77	0.10	0.00	0.00
Sunday/night	0.04	0.63	0.18	0.01	0.01
Observations	836,736	836,736	1,454,879	1,454,879	31,405

Notes: (1) Share of zero wage changes between 2014 and 2012; (2) Share of negative wage changes between 2014 and 2012; (3) Share of employees receiving a non-zero payment; (4), (5) Average share in the employee's wage, and firm's payroll, respectively.
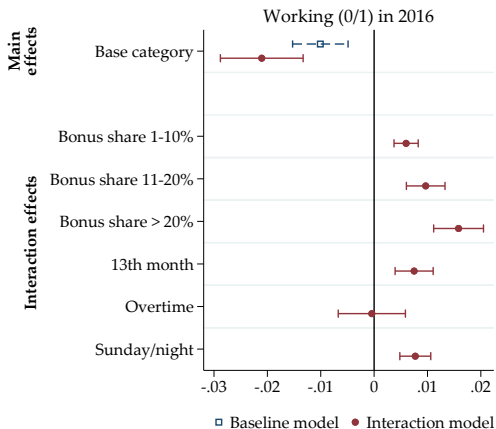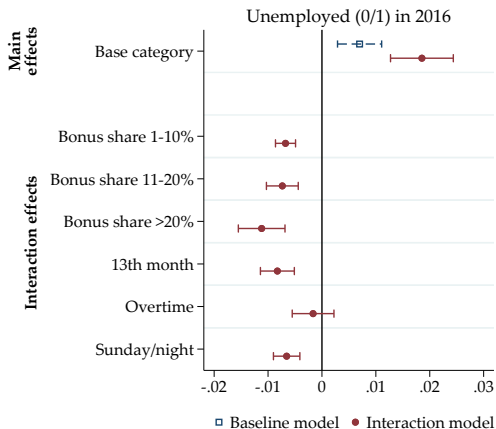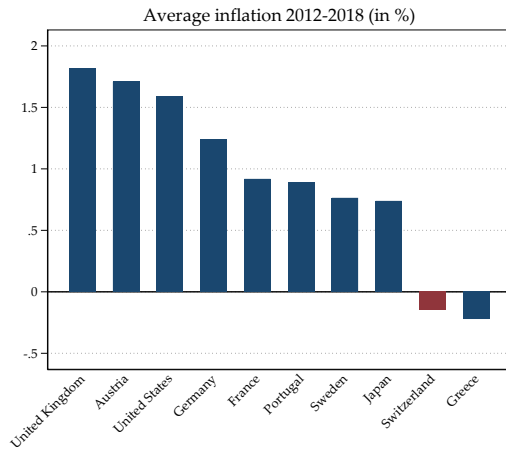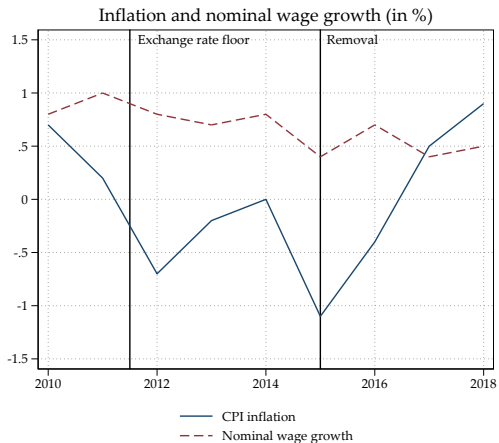
Notes: Average difference in the probability of working and being unemployed, between employees with wage freezes and small wage cuts in 2014. The interaction effects measure the difference to the base category.
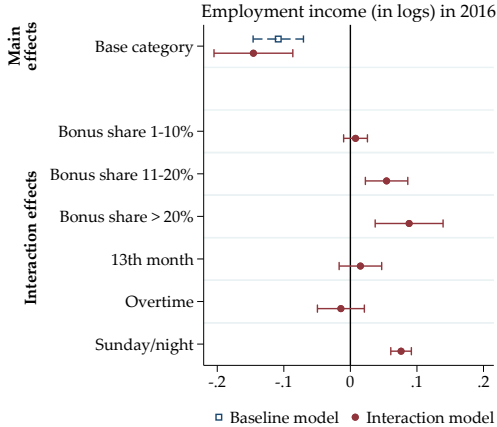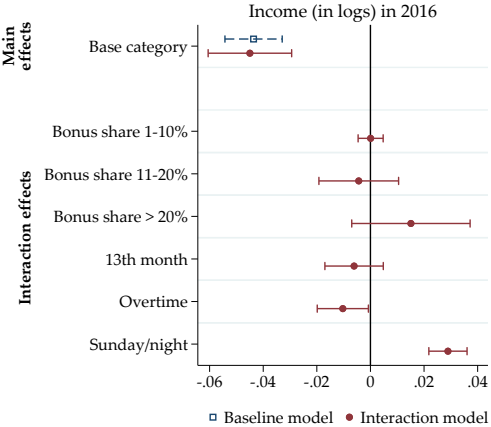
Notes: Average difference in the (employment) income, between employees with wage freezes and small wage cuts in 2014. The interaction effects measure the difference to the base category.

Concluding remarks

– Downward nominal wage rigidity is a **pervasive feature** of the Swiss labor market and has **adverse effects** on employment outcomes after a deflationary shock

– Even though rigidities bind only for a modest share of workers, effects on income and unemployment are **economically relevant**

– **Flexible wage components** (i.e. bonus payments) mitigate the negative allocative effects on employment, but do not completely offset them

– Not only timing of wage setting (Olivei and Tenreyro, 2010, 2007), but **worker heterogeneity** (share of bonus payment) matter for **monetary non-neutrality**

– Implications for **monetary policy**: Nominal rigidities are an important factor to determine **inflation target**, especially for economies with less flexible labour markets

Appendix

Inflation and nominal wage growth (in %)

Average inflation 2012-2018 (in %)

Existing literature on (downward) nominal wage rigidities

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

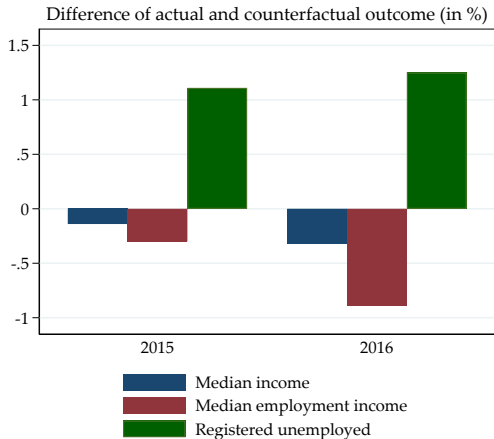Inefficient distortions **remain debated** (Barro, 1977, Issing et al., 2003, Elsby, 2009, Basu and House, 2016, Elsby and Solon, 2019, Grigsby et al., 2021)

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)

Difference of actual and counterfactual outcome (in %)

Median income
Median employment income
Registered unemployed

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.

Income 2015 (in log)
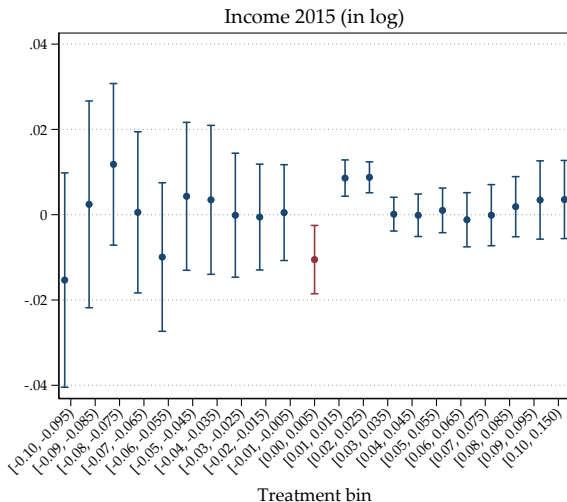
Treatment bin

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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