FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

Does Short-Time Work Save Jobs? A Business Cycle Analysis

Almut Balleer, Britta Gehrke, Wolfgang Lechthaler and Christian Merkl*

***University of Erlangen-Nuremberg and Kiel Institute**

Bundesbank-IAB Workshop
12./13. June 2014

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

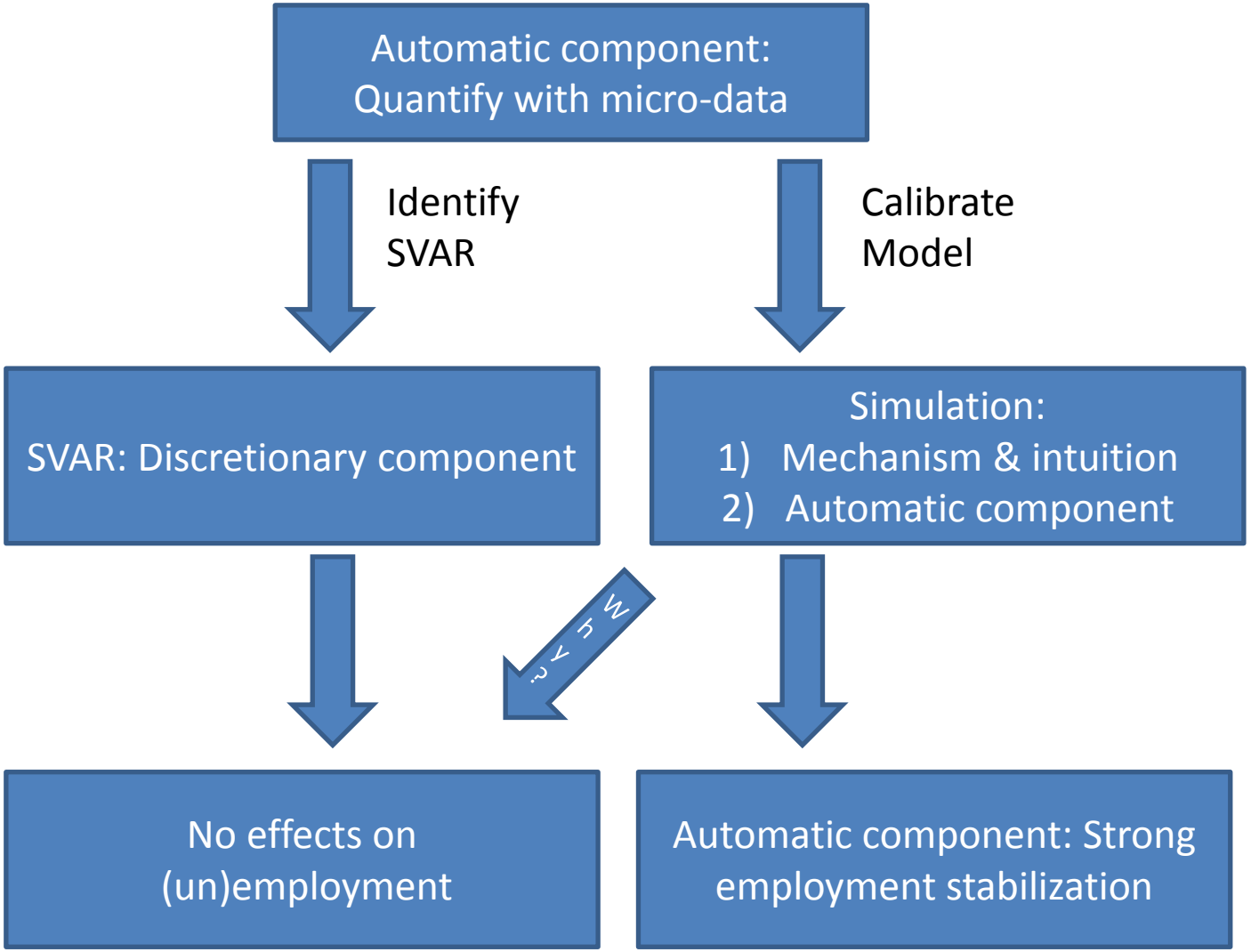
Motivation

*"Germany came into the Great Recession with strong employment protection legislation. This has been supplemented with a "**short-time work scheme**," which provides subsidies to employers who reduce workers' hours rather than laying them off. These measures didn't prevent a nasty recession, but Germany got through the recession with remarkably few job losses." (Paul Krugman, 2009)*

- This paper argues that it is important to distinguish the automatic and discretionary components of STW.
- Key result: only automatic component stabilizes employment, while the discretionary component does not seem to be an important stabilizer.

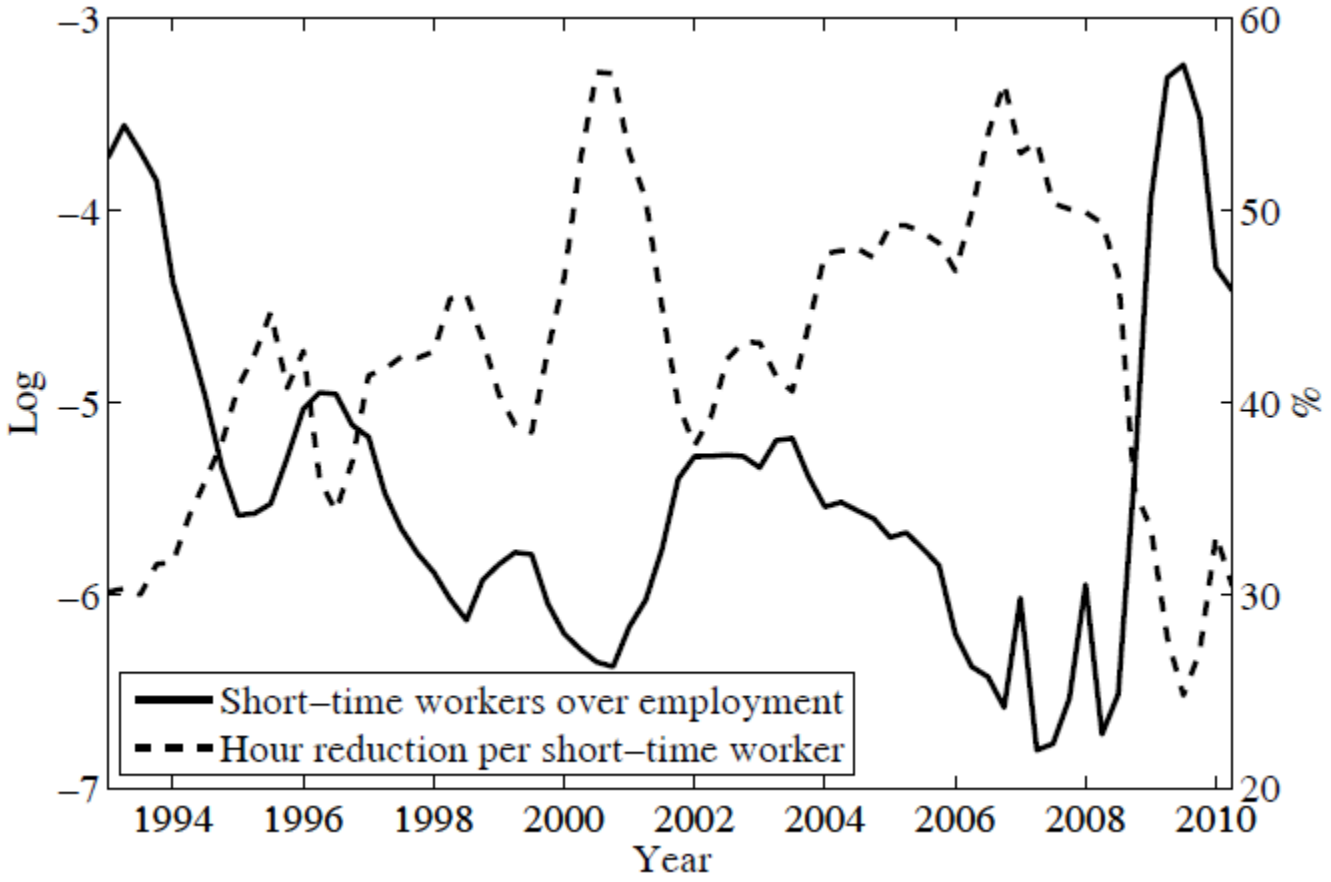
FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

The Paper on One Page



FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

STW: Two Margins



STW: intensive margin procyclical

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

Estimating a Micro-Elasticity

- What is the automatic response of STW with respect to output changes?
- Data: IAB establishment panel

$$y_{it} = \mathbf{x}_{it}\beta_1 + \alpha_i + \gamma_t + \mathbf{z}_{it}\beta_2 + u_{it}$$

Fraction of STW in employment

Expected revenue

- Fixed effects estimations, Tobit and Heckman selection model
- Range of estimated elasticities: −3.31 to −7.84

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

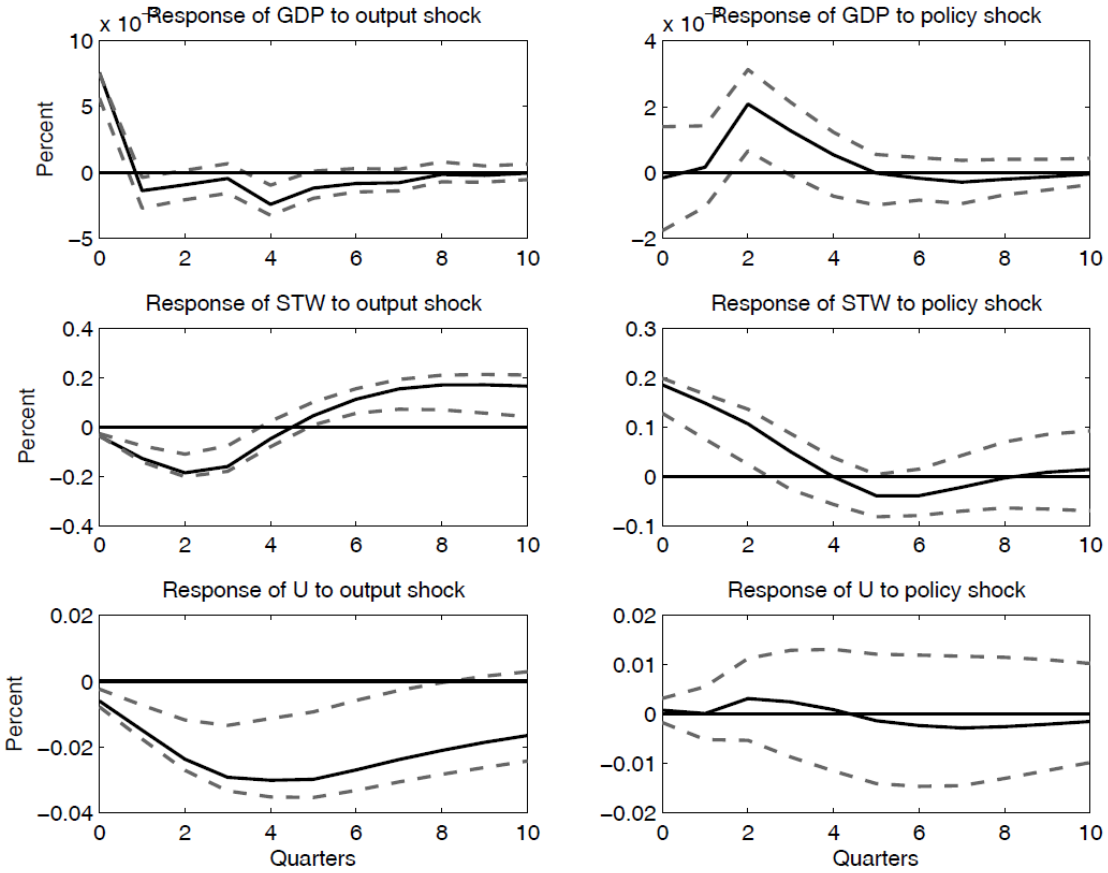
SVAR Strategy

- Structural VAR in the tradition of Blanchard and Perotti (2002)
- Setup:
  - Bivariate VAR with a non-policy (GDP) and a policy variable (STW/EMP)
  - Baseline specification for 1993 Q1 to 2010 Q4
- Identification:
  - Separate two shocks: business cycle shock and policy shock
- Key assumptions:
  - Policy does not immediately react to GDP shocks
  - The effect of GDP shocks on the policy variable then exclusively measures the automatic output elasticity of the policy variable
- Micro-estimate of the elasticity is imposed as short-run restriction

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

SVAR-Results: Baseline

Figure 3: Impulse responses to output and STW policy shocks



Notes: SVAR estimated with log STW per employed workers, GDP growth and the log unemployment rate for 1993Q1 to 2010Q4. Quarterly responses to a positive one-standard deviation shock. Confidence intervals are 90% bootstrapped bands with 10,000 draws.

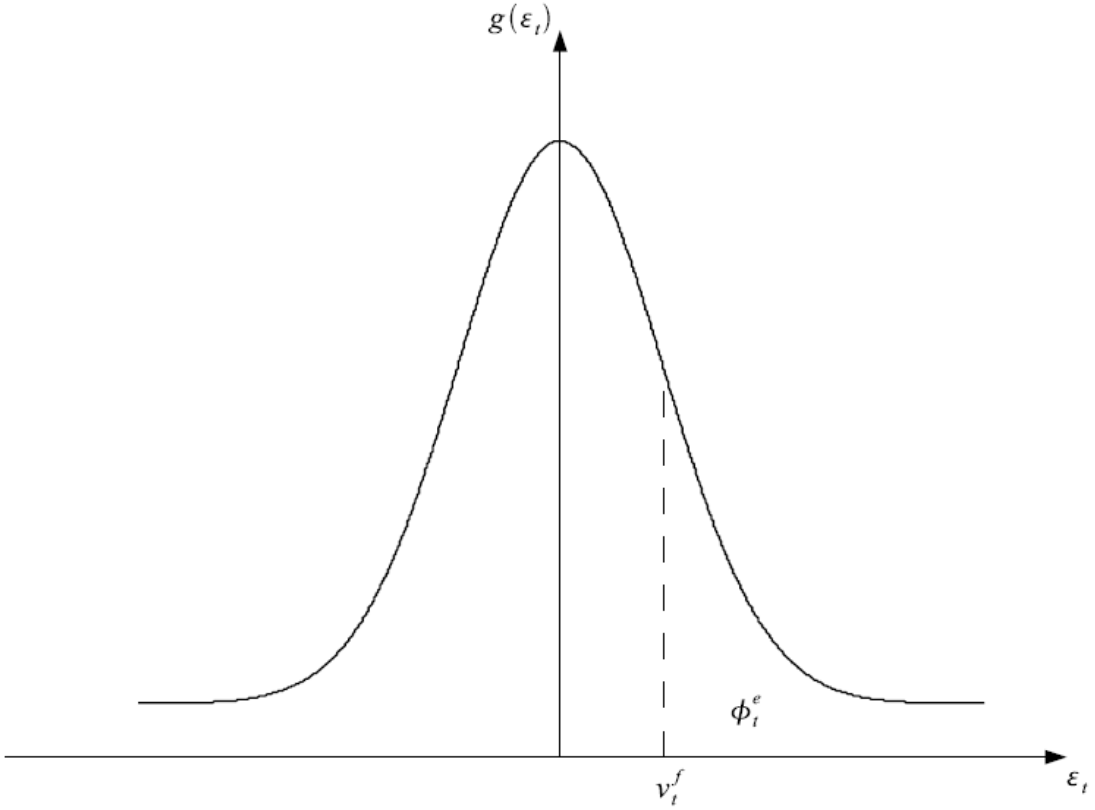
FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

The Model in Words

- Dynamic search and matching model
- Endogenous separations
- Business cycle shocks
- Unprofitable worker-firm pairs are eligible for STW
- Hours adjustment subject to quadratic adjustment costs
- Model is calibrated to match the elasticity of STW with respect to output.
- Interesting: Intensive margin of STW is procyclical in simulation.

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

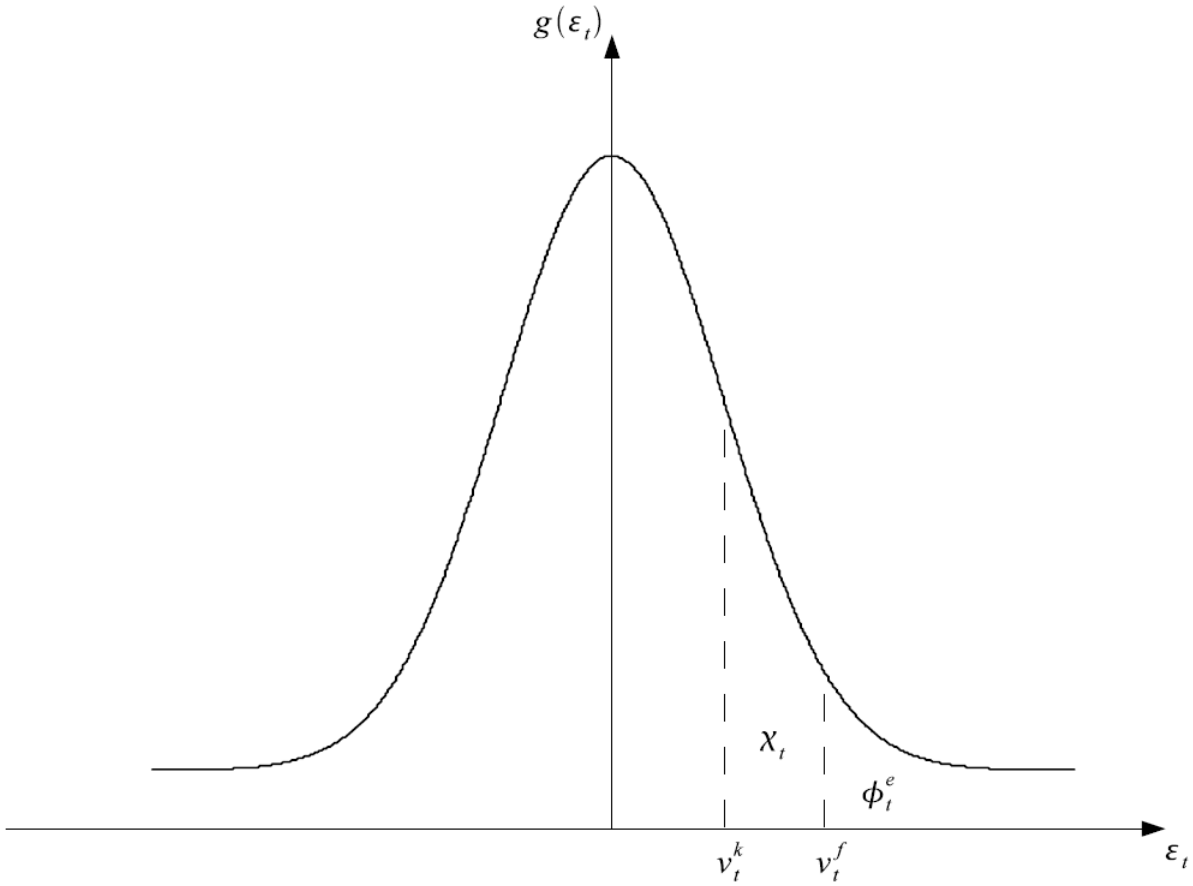
Separations: Economy without STW



- Firing cutoff: $v_t^f = a_t - w_t + E_t \beta J_{t+1}$
- Endogenous separations: $\phi_t^e = \int_{v_t^f}^{\infty} g(\varepsilon_t)\, d\varepsilon_t$

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

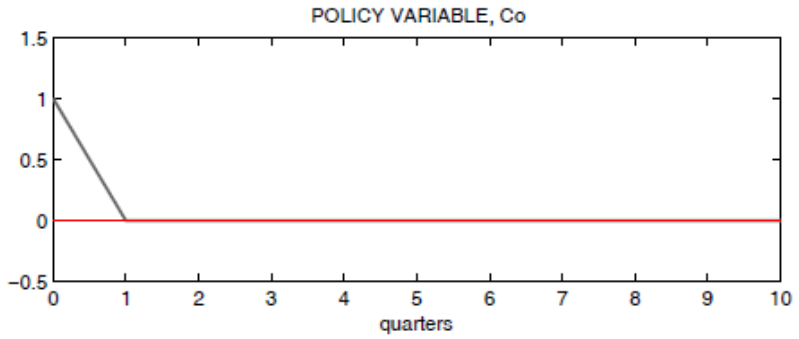
Short-Time Work

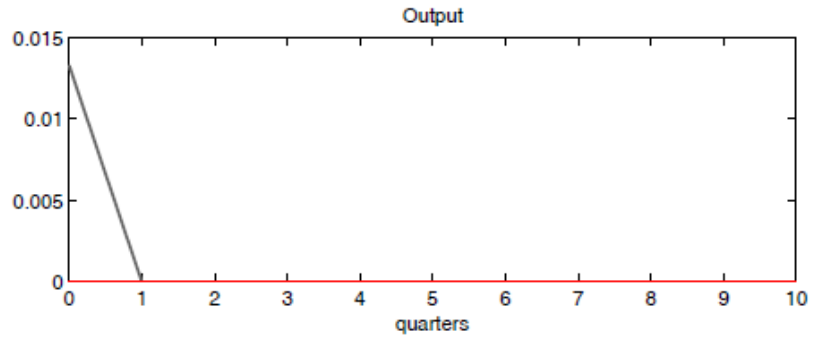


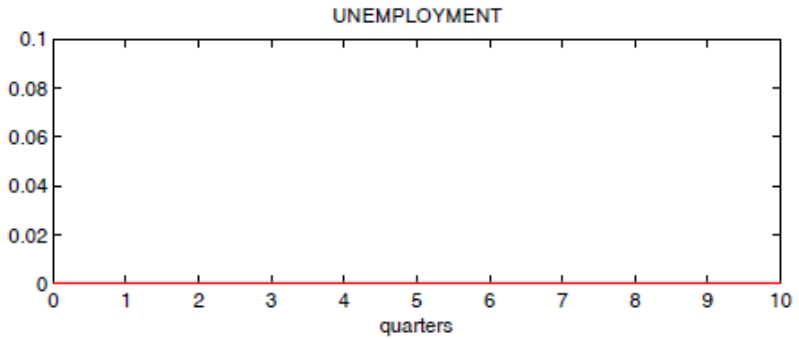
Discretionary component:
vk moves to the left

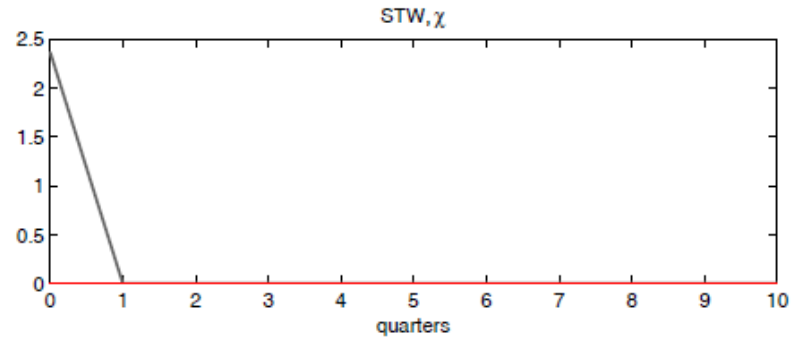
FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

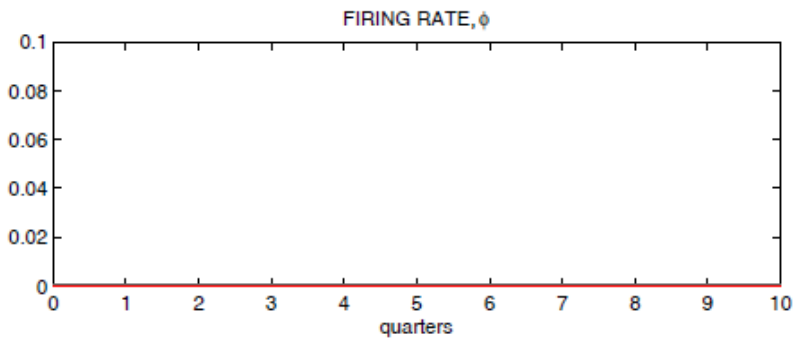
Results of Discretionary Policy (Temporary)





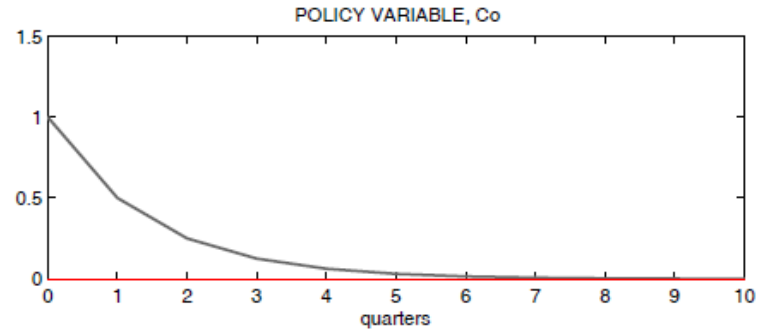


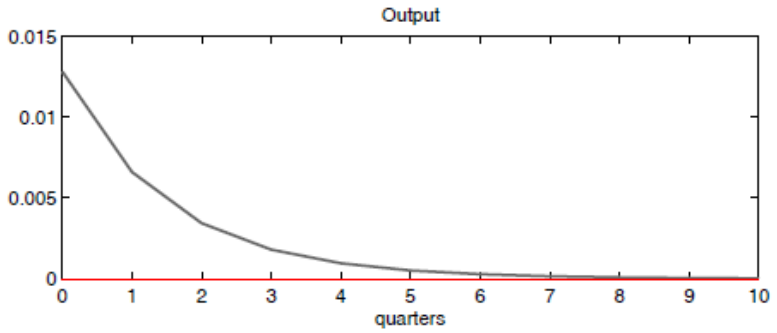


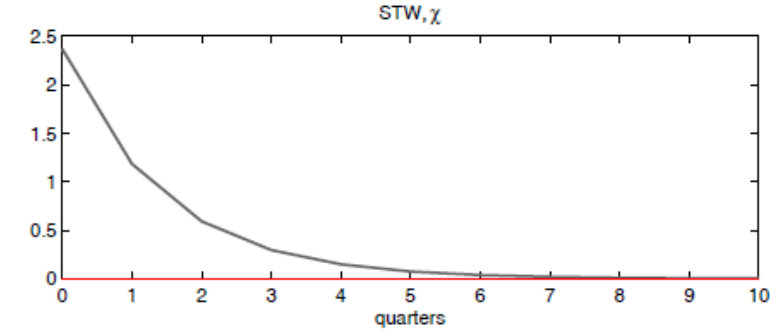


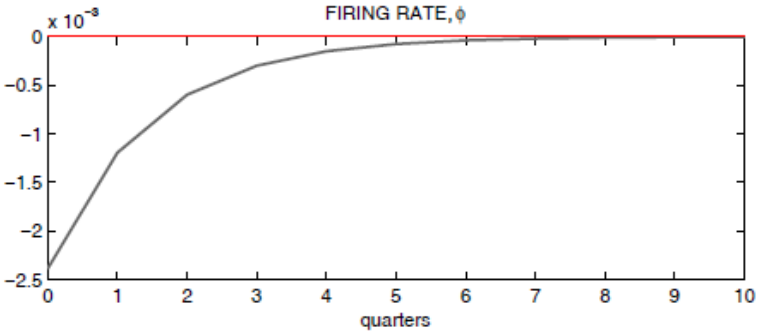
FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

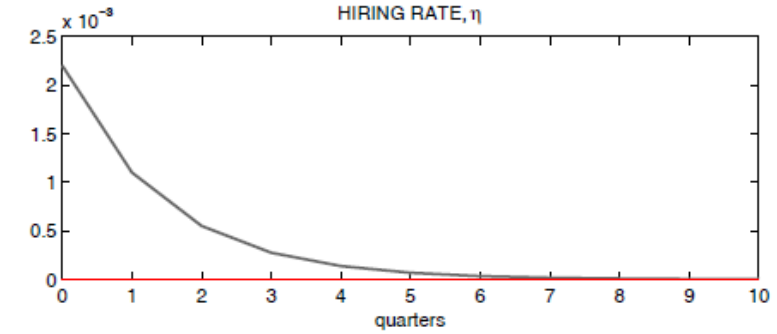
Results of Discretionary Policy (Persistent)











FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

Stabilization Effects

- Simulation of two economies (with and without STW).
- Driving force: Productivity shocks with autocorrelation 0.95 and standard deviation 0.01.

Stabilization in %	baseline	$f = 1.2$	$f = 0$	distortionary taxation
Output y	-3.9	-3.5	-2.8	-3.9
(Un)Employment u	-21.2	-13.1	-6.5	-20.9

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

Intermediate Results from Simulation

- Automatic component of short-time works as a strong business cycle stabilizer.
- Comparison: Income tax system stabilizes output fluctuations by 6-30% (compare in’t Veld et al. 2013).
- But the income tax system is more than 10% of GDP (in most OECD countries), while STW costs divided by GDP < 0.1% of GDP.

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Counterfactual Exercise: Short-Time Work in the US

- Individual bargaining, zero firing costs, US labor market flows

Stabilization in %	German case	US case	
	baseline	German c_K	German STW share
Output y	3.8	0.1	0.5
Unemployment u	21.2	0.7	4.0

FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG

Short-Time Work and the Great Recession

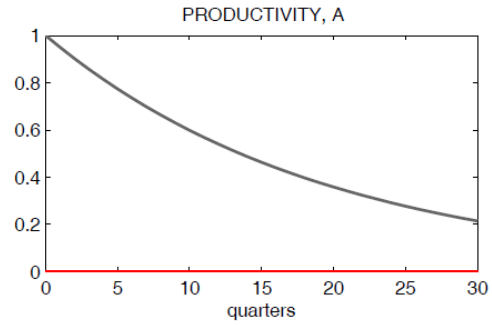
- 6.6 percent decline of GDP should have generated a (peak) increase of unemployment of 4.8 percentage points (according to the SVAR).
- Model prediction: STW prevented an increase of unemployment of 1.3 percentage points (i.e. 466,000 jobs).
- Thus, STW is certainly only one factor among many to explain the German “labor market miracle” (Möller 2010).
- Altough we use a completely different methodology, our Great Recession results are roughly in line with Boeri and Bruecker (2011) and Burda and Hunt (2011).

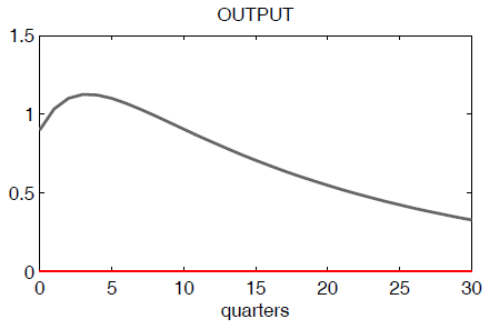
	log exp. revenue	derived elasticity	year fixed effects	employees in firm	industry	observations
Linear fixed effects						
(1)	−2.802*** [0.306]	−4.003				39,545
(2)	−2.968*** [0.299]	−4.240	yes			39,545
(3)	−3.131*** [0.342]	−4.473	yes	yes		31,824
(4)	−3.363*** [0.382]	−4.804	yes	yes	yes	28,671
Fixed effects tobit						
(5)	−2.319*** [0.286]	−3.313	yes			31,824
(6)	−2.614*** [0.311]	−3.734	yes	yes		31,824
(7)	−2.856*** [0.333]	−4.080	yes	yes	yes	28,227
Fixed effects heckman						
(8)	−4.972** [2.57]	−7.103	yes			31,824
(9)	−4.87* [2.75]	−6.957	yes	yes		35,264
(10)	−5.49** [2.84]	−7.843	yes	yes	yes	34,642

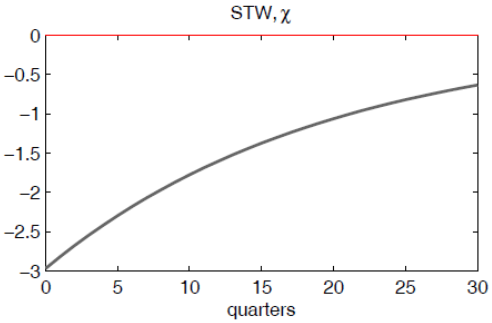
Table 1: Elasticity estimates. Dependent variable is the number of workers in STW over total employees in the firm. *** denotes 1% significance, ** denotes 5% significance, * denotes 10% significance.

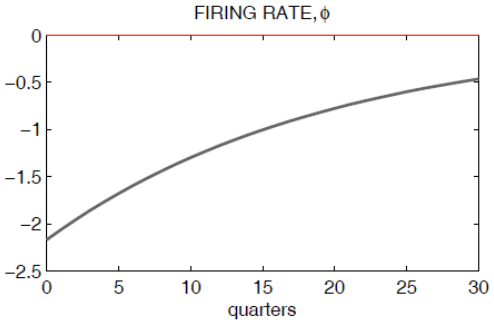
FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

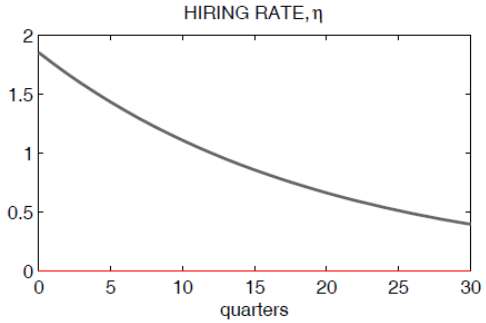
Business Cycle Shock

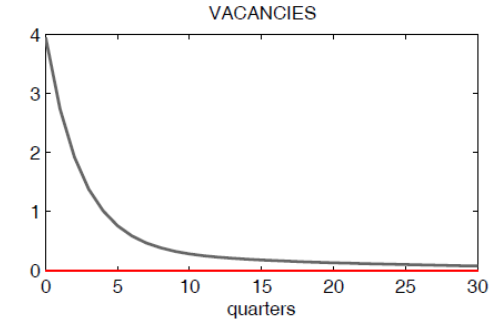


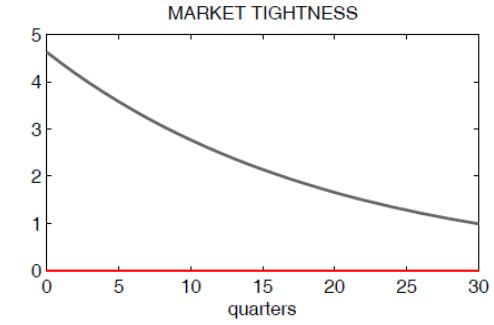


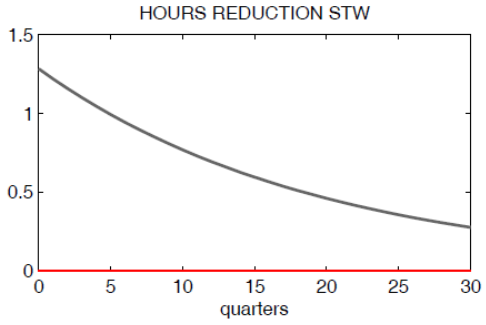






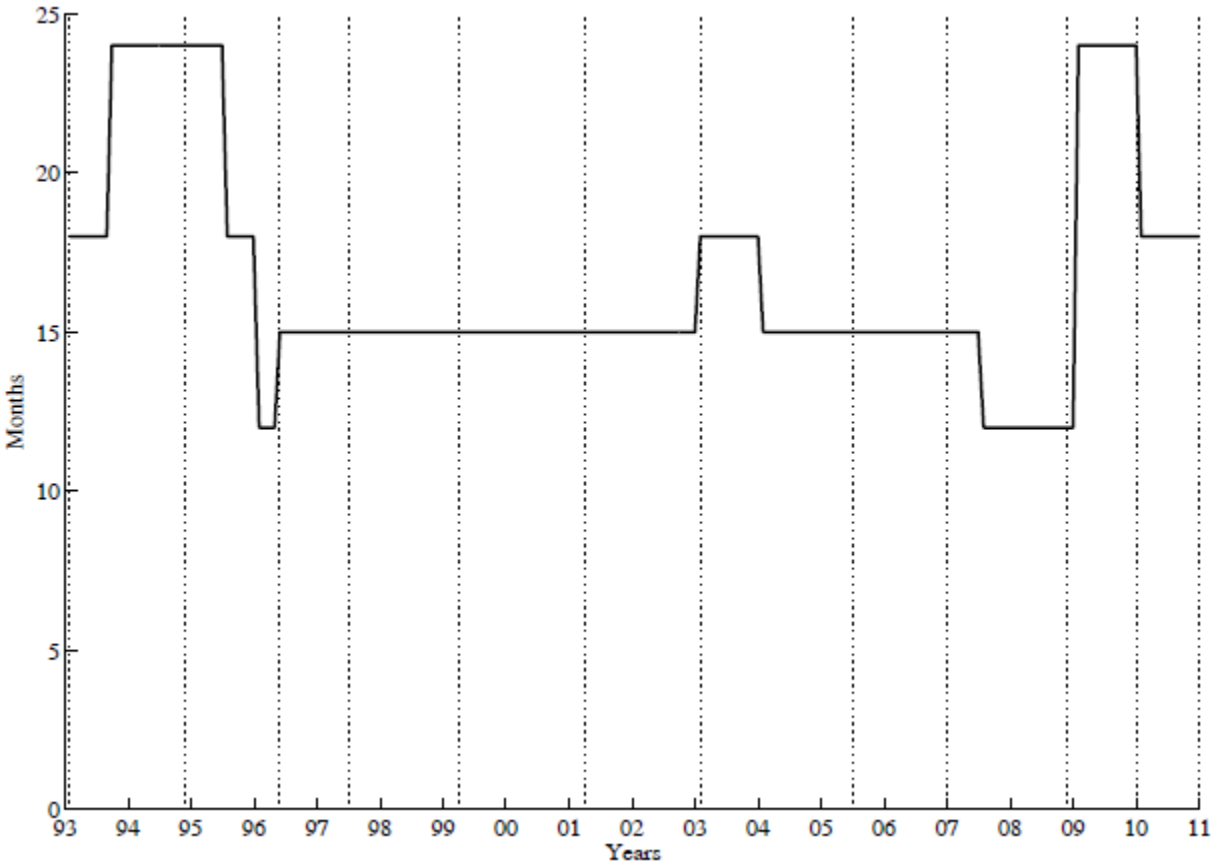






FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

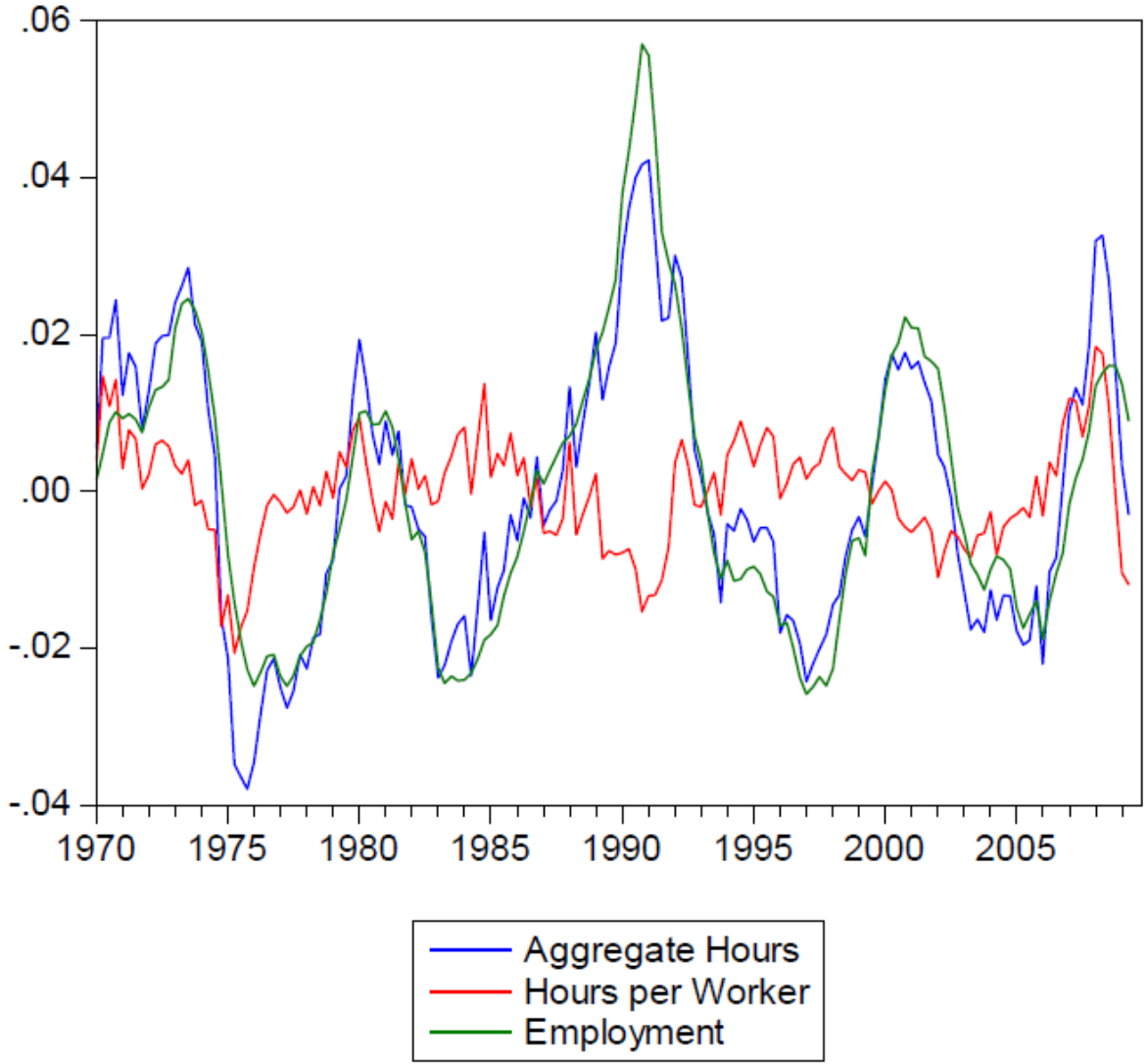
Discretionary Interventions

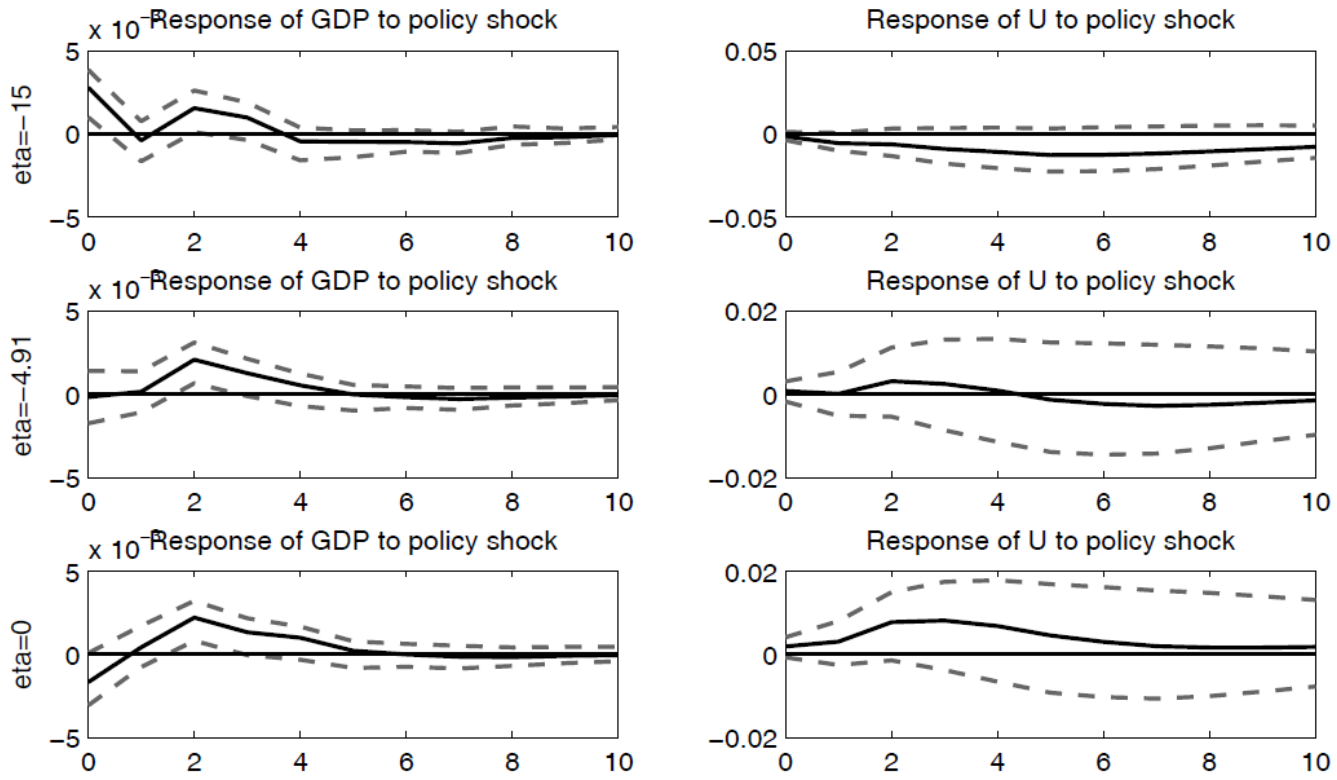


Maximum duration

FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

Labor Adjustment over the Business Cycle in Germany



FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

VAR-Results: Robustness