

# Employment retention in the recession: Microeconomic effects of the Short-Time Work Programme in Germany

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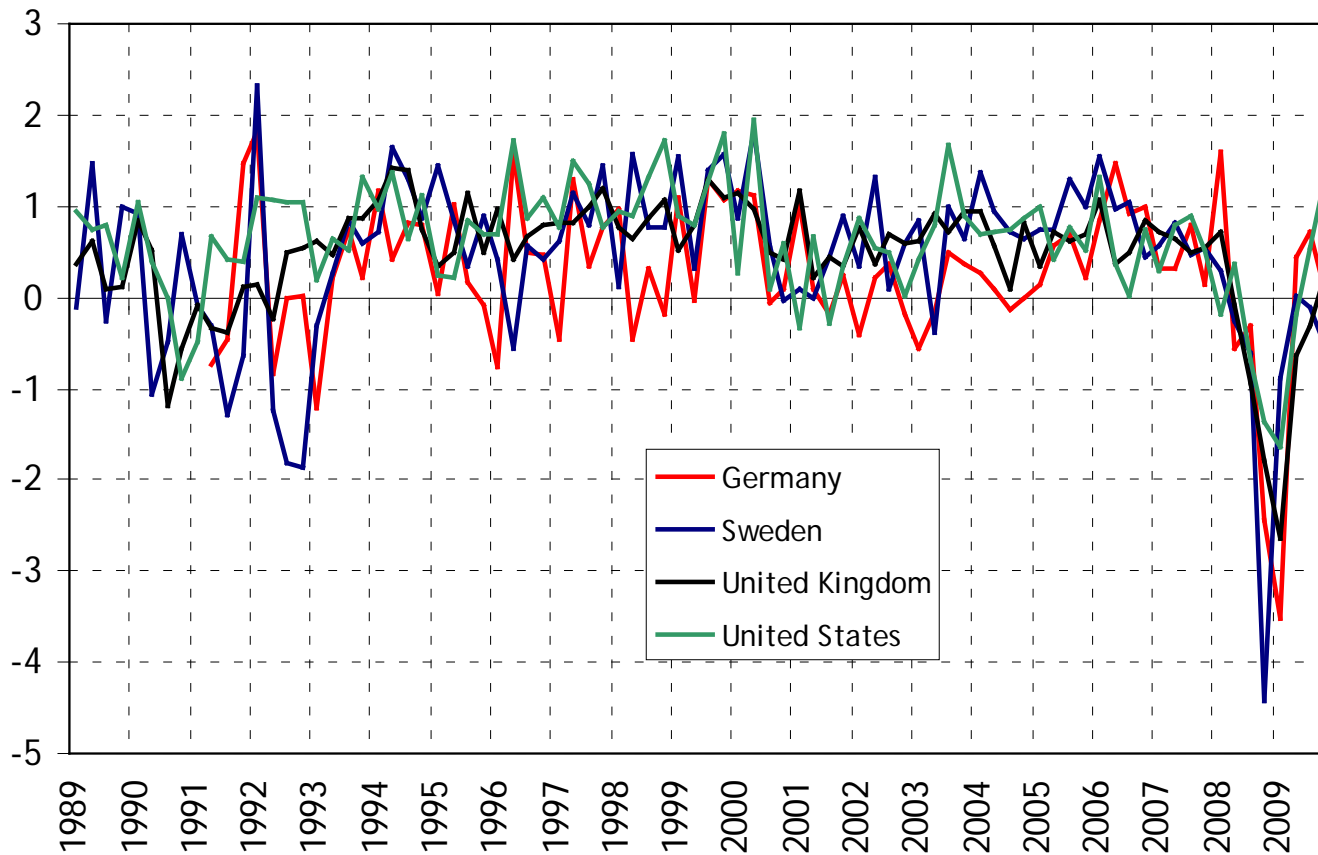
# Outline

- Introduction:  
Recession, labour market impact and short-time work and previous findings
- Short-time work:  
Regulation, programme size and theoretical effects
- Empirical analysis:  
Data and descriptive analysis (workers and firms), causal analysis/identification, estimation and results
- Conclusion

**Introduction:  
Recession, labour market impact,  
short-time work and previous findings**

# Recession

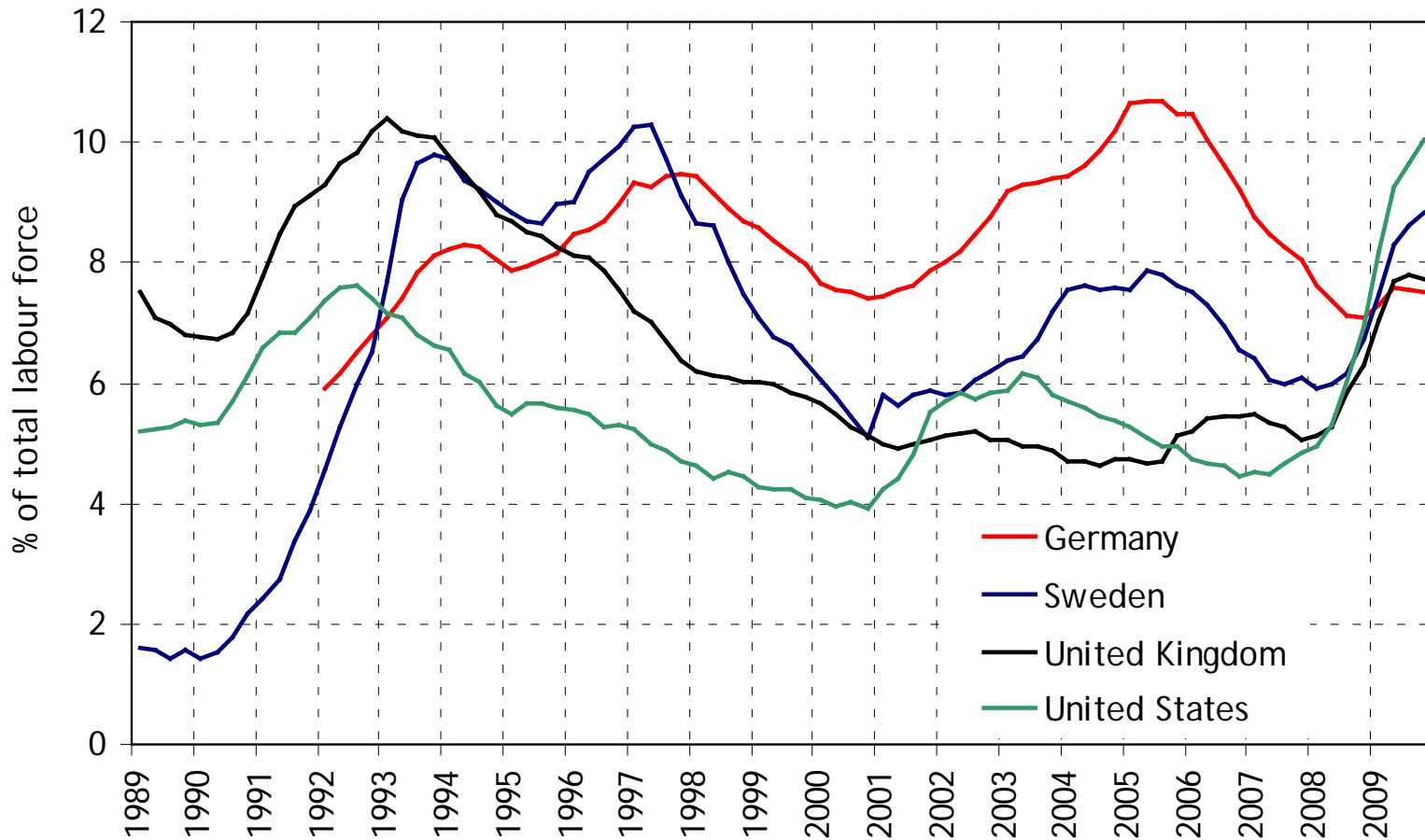
- GDP change by quarter(%)



Data extracted on 30 Mar 2010 14:26 UTC (GMT) from OECD.Stat

# Labour market impact

- Quarterly unemployment rates



Data extracted on 08 Apr 2010 08:10 UTC (GMT) from OECD.Stat

# Labour market impact

- By second quarter of 2009, GDP in Germany had fallen by almost 7% in real terms compared to the previous year, but unemployment rates remained low
- This may be following government interventions
  - Deficit spending
  - Temporary adjustment schemes (building sector, scrappage programme for the car industry)
  - “Short-time work compensation” (extensive employment retention programme)

# Short-time work

- Temporarily reduce the working time and salaries
- Fractional unemployment benefit paid instead to compensate wage reduction, often topped up by collective agreements
- Enhanced incentive regime & active advertising



- *Bundestag* elections (27/09/2009) & "Hartz IV"

# Short-time work

- Programme covered 1.43 million workers (June 2009)
- Employment effect: 435,000 full-time equivalents (average 35% working time reduction)
- Positive: Welfare reform and labour market flexibility:
  - The UK, the USA and Sweden experienced rapid increase in unemployment (and severe effects on household incomes and spending)
  - German model: Flexible adjustment to lower outputs
- Negative: Programme believed to “delay “structural change” (but no empirical evidence)



# Previous findings

- Evidence on microeconomic effect limited
  - Buechel and Pannenberg (1992): “Downgrading” less widespread among former short-time workers compared to unemployed (in East Germany)
  - Calavrezo, Duhautois and Walkowiak (2009): No evidence of effect on firms’ redundancy behaviour (for France)
  - Some paper on design/incentive effects (Deeke 2009, Crimman and Wiessner 2009, Eichhorst and Marx 2009, Sell 2009) or calculations of full-time equivalents (Flechsenhaar 1979, Mosley and Kruppe 1996, Henner Will and Brautzsch 2009)

# Previous findings

- Full-time equivalents: Evidence is descriptive and does not evaluate the microeconomic effect
  - In short run, full-time equivalents do not correspond to the net impact of the programme because some employment retention would have also happened in the absence of the programme
  - In the long, full-time equivalents do not provide an understanding of the likely impact of the programme on important microeconomic variables of firms (long-term costs, production reorganisation)

# Regulation, programme size and costs and theoretical effects

# Regulation

- Differences types of seasonal, transfer and cyclical STW (all regulated in the nationwide German Social Law Book III [Sozialgesetzbuch III])
- Cyclical STW: Allows firms to retain staff that would have otherwise been made redundant, keeping specific human capital and processes knowledge
- Working time reduction usually in excess of 10% (for at least one third of all employees [criterion weakened in recent recession])
- Compensation for up to six months (extended in the recessions 1993 (to 12 months ) and 2009 (24 months )

# Regulation

- Approved by the (union-dominated) Workers Councils (Betriebsräte)
- Paid out of (mandatory) unemployment insurance, but does not reduce the maximal individual benefit allowance: Participants retain full entitlements (one year 60/66% of previous net)
- Participants must be ready for placements, but programme neither enforces rigorous job seeker regime nor sanctions non-compliance

# Programme size and costs

	West		East		Total	
	Annual average participants ('000)	Expenditure in Mill. €	Annual average participants ('000)	Expenditure in Mill. €	Annual average participants ('000)	Expenditure in Mill. €
1992	283	485.73	370	1,356.46	653	1,842.18
1993	767	1,705.16	181	469.88	948	2,175.04
1994	275	818.07	97	255.65	372	1,073.71
1995	128	309.84	71	216.79	199	526.63
2000	62	272.01	24	76.18	86	348.19
2001	96	339.00	27	76.00	123	415.00
2002	166	501.00	41	103.00	207	604.00
2003	161	585.00	35	102.00	195	687.00
2004	122	589.00	29	83.00	151	672.00
2008	37	n.a.	9	n.a.	46	131.00
2009*	n.a.	n.a.	n.a.	n.a.	1,040	1,151.00

\* Spending only January-June 2009, forecast of annual average. Annual reports of Bundesagentur für Arbeit 1997-2009)

# Theoretical effects: Firms

- Recession intensifies reallocation activities, with likely impact on productivity of firms
  - Drop in production/profitability affects short-term profitable production, which may fail to recover long-term average costs. Unless positive option value of retaining it, firm terminates such production and reallocates labour/capital employed
  - Lower costs of factor re-allocation/modernisation in recession compared to boom (when production levels and profitability are high)
  - Reduced credit availability requires cost reduction (eg labour costs) to increase short-run profitability

# Theoretical effects: Firms

- Effects of short-time work on firms:
  - Delay: Adjustment/lay-offs follow on expiration
  - Reduction of long-term costs: Extensive use of STW reduces long-term costs and a production failing to recover long-term average costs can remain profitable (for some time). Firms resume a profitable production after recession, but will require lowering costs in the long run, including labour costs
  - Reallocation: Reduction of short-term costs may facilitate production reorganisation by saving unnecessary costs for lay-offs and re-hiring



# Theoretical effects: Workers

- Standard job search models: unemployed jobseekers accept arriving job-offer if the wages exceed a level of reservation wages (more likely the longer the job search): Job offer is taken if the marginal benefits equate marginal costs
  - Cost reduction of job search: Reduction of job search costs (=mitigation of earnings loss relative to open unemployment) increases the reservation wages and delays job acceptance
  - Effects on job arrival rate: Formally employed short-time workers may yield more favourable job offers than job search of the unemployed (reducing overall search time and unemployment duration)

**Empirical analysis:  
Data and descriptive analysis (workers  
and firms), causal analysis,  
estimation and results**

# Data: Workers affected by STW

- Individuals: German Socioeconomic Panel (GSOEP)
  - Representative longitudinal study of individuals since 1984, but small sample size (N ~ 20k)
  - Participation data for 1993 (STW only included in monthly “biographies” until 1993)
  - Allows credible estimation of the non-participation outcome for participants (rich covariates, some firm/workplace information, etc.)
  - Recession 1993: Similar to 2009, but allows considering long-term outcomes that materialise after the end of the programme (net effects)

# Descriptive analysis: Workers

- Workers: STW taken up in sectors with strong unionisation (2/3 of all short-time workers in non-metal manufacturing, the chemical industry and basic materials, [only 10% of total non-participants] due to institutional design)
- Levels of qualification for the workplace (more lower, similar mid-level qualifications for short time workers, degree holders under-represented)
- Standard working time of group not affected by STW generally lower (possibly buffers to some extent cyclical variations through alternative arrangements)

# Data: Firms implementing STW

- Firms: German Establishment Panel (started in 1993)
  - Wide range of firm characteristics (business development, investment and expectations)
  - Paper used the first survey of the IAB Establishment Panel (1993), sampling 4,265 firms
  - 2,905 firms included in the study (of which 453 implement the programme).
  - Significant reductions in sample sizes due to the non-response some characteristics)

# Descriptive analysis: firms

- 60% of firms with STW from manufacturing (20% of all non-participating firms). Service sector firms (two thirds of other firms) practically don't implement STW
- Capital corporations (26%) and owned firms (74%) dominate (virtually no plc's [17% of firms without short-time work])
- 44% of firms with STW > 1,000 employees (16% of other firms)
- Fewer white collar workers lower in firms with STW (28% compared to 46%)
- Programmes used by firms with lower profitability and negative development of business activities in the past

# Causal analysis/identification

- Key questions:
  - Does STW stabilise employment and earnings?
  - Does STW influence the performance of the firms?
- No random allocation, ie non-participating individuals (or firms) do not provide credible estimates of the absence of STW impact.
- Strategy: Estimate a measure of comparison representing [what would have happened in the absence of STW] based on non-participating individuals (firms) with identical/similar observable characteristics

# Estimation

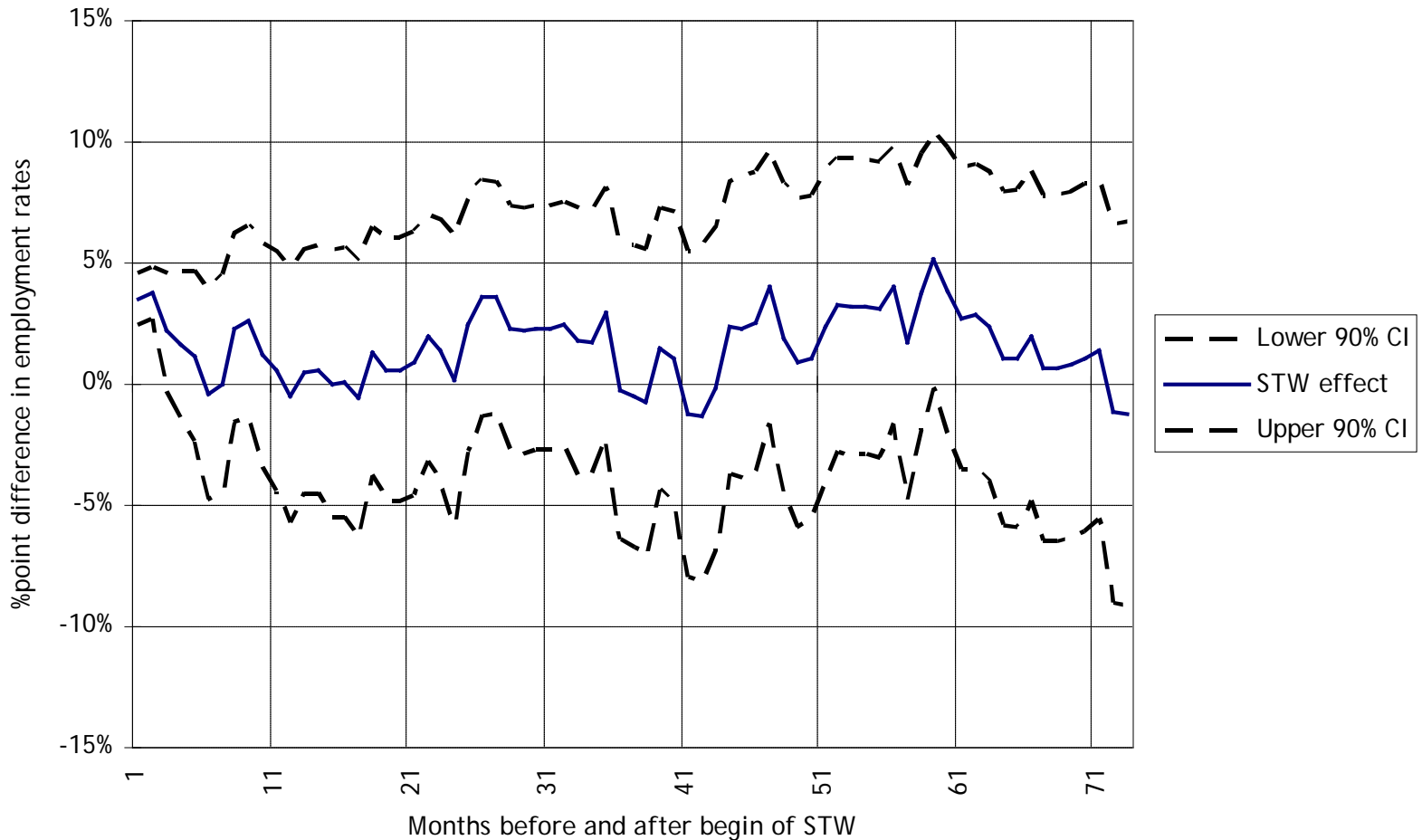
- Non-participation outcomes estimated at  $i$  individual/firm using all available non-programme observations
- “Local outcome” is a weighted average of all non-treated individuals using local linear regressions (“Kernel matching”)
- “Curse of dimensionality”: Matching on probability of participation (propensity score) as a function of characteristics  $X$  (Rosenbaum/Rubin 1983 [For individuals including firm and individual characteristics, many more included in propensity scores for firms, e.g. workers’ council, skill distribution, business volume, investment, historical and expected development, HR requirements])



# Estimation

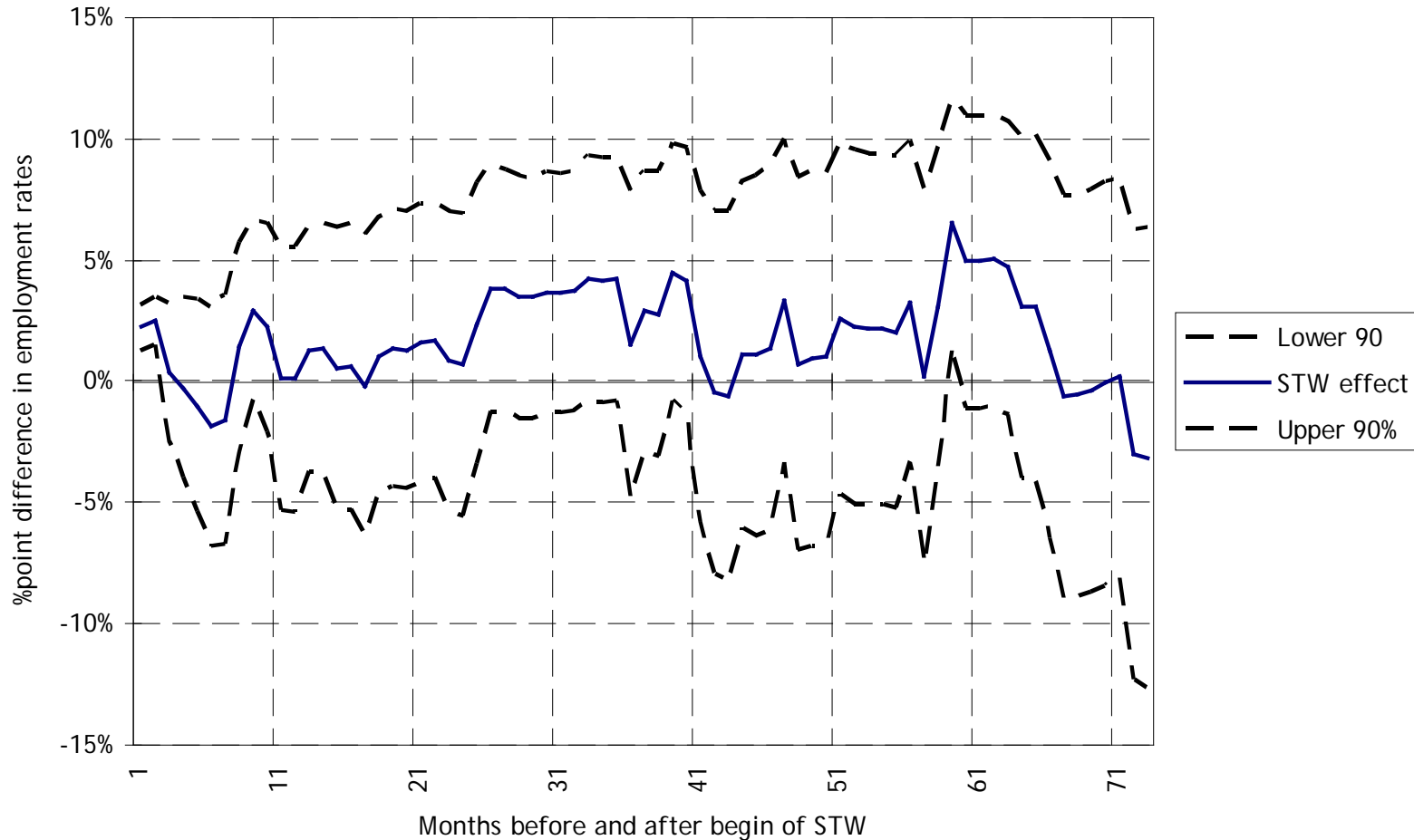
- Technical implementation:
  - Model resulted from benchmarking many models
  - Support: non-STW firms/individuals available representing the participating individuals/firms (>98 %)
  - Choice of bandwidth for the local linear regressions using “leave-one-out method” considering the locality of participating firms/individuals to non-participants (Galdo, Smith and Black 2009)
  - Test for matching quality wrt covariates (Balancing test for characteristics applying local linear regressions as for outcomes) shows no significant differences

# Results: Employment rates



Source: GSOEP, Waves I-R (1992-2000), own calculations

# Results: West Germany only



Source: GSOEP, Waves I-R (1992-2000), own calculations

# Results: Wage differences

	Participants in short-time work	Matched Non-Participation outcome	Difference	N observed
1991	3,265.80	3,216.94	48.85	128
1992	3,376.79	3,407.02	-30.23	130
1993	3,457.57	3,606.16	-148.59*	134
1994	3,617.05	3,822.15	-205.10*	118
1995	3,850.53	4,014.50	-163.97*	102
1996	3,977.58	4,125.73	-148.15*	102
1997	4,212.90	4,266.45	-53.55	90
1998	4,112.35	4,288.41	-176.06*	88
1999	4,188.28	4,488.25	-299.97*	81
2000	4,158.57	4,609.69	-451.13*	76

Source: GSOEP, Waves I-R (1992-2000), own calculations

# Results: Firms

	Year	Firm implementing short-time work	Matched control outcome	Difference	T-stat	N
Total business volume per employee in 1,000 €	1993	167	171	-4	-0.15	290
	1994	133	169	-36	-6.35	247
	1995	143	224	-80	12.72	223
	1996	149	186	-37	-5.39	196
	1997	154	204	-50	-6.86	175
	1998	166	204	-36	-3.79	155
Total investment per employee in 1,000 €	1993	7	11	-5	-7.90	263
	1994	7	9	-3	-4.86	223
	1995	6	12	-6	11.82	222
	1996	5	7	-2	-3.85	198
	1997	6	11	-5	10.98	177
	1998	7	8	-1	-1.37	157

Source: IAB Establishment Panel, Waves 1993-1999, own calculations (non-BS)

# Conclusion

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- Employment effects of STW lasts for only three months, after that are virtually the same
- Some evidence of lower wages for short-time workers in the long run (possibly due to firms need to continue lowering costs in the long run)
- Complementary findings based on firm data: Firms implementing STW grow less dynamically and invest significantly lower per employee compared to the estimated non-STW outcome
- STW may have adverse affects on long-term prospects of firm compared to alternative mechanisms chosen in firms in similar circumstances (e.g. lay-offs or termination of temporary employment)

# Conclusion

- Great methodological difficulties
- No micro-economic data at the level of individuals for the recent recession available for independent research organisations
- Extent to which firms rely on programme would need to be controlled for
- Potential problems with microeconomic identification strategy (SUTVA/aggregate effects, historical circumstances, different credit market constraints in 2009 recession relative to 1993, ...) and yet: some consistency with macroeconomic indicators



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"From both the macro evidence and this body of microeconomic work, a large consensus - right or wrong - has emerged. It holds that modern economies need to constantly reallocate resources, including labour, from old to new products, from bad to good firms. At the same time, workers value security and insurance against major adverse professional events, job loss in particular. (...)

What is important in essence is to protect workers, not jobs. This means providing unemployment insurance, generous in level, but conditional on the willingness of the unemployed to train for and accept jobs if available. This means employment protection, but in the form of financial costs to firms to make them internalize the social costs of unemployment, including unemployment insurance, rather than through a complex administrative and judicial process. "

Blanchard (2000), European unemployment: the evolution of facts and ideas