

## The causal effect of unemployment on social inclusion and health

### Extended Abstract:

This study aims to reveal the causal link between unemployment and social inclusion as well as individual health. Social inclusion and individual health are two important concepts which characterize potential social costs of unemployment and thus are of particular interest for the analysis of labor market outcomes. Recent studies investigating the causal link between unemployment and health using survey data did not find a significant causal relation (Salm, 2009 for Great Britain and Schmitz, 2011 for Germany), whereas studies investigating the effect of unemployment on mortality using administrative data did find an adverse effect (Sullivan and von Wachter, 2009 for administrative data from Pennsylvania).

In this paper a quasi-experimental IV approach is used where firm closure serves as an exogenous instrument to uncover the causal effects of interest. The sample consists of individuals who have had employment spells in 2003 of which some were randomly selected into unemployment because of firm closure. The local average treatment effect is therefore identified by those individuals who were affected by firm closure in the years 2004-2006 and are still unemployed at the beginning of 2007 (Angrist and Pischke, 2009). The exogeneity of firm closure will be evaluated using firm takeovers and split-ups, because those two events also heavily affect the structure of the firms but do not result in unemployment and also do not have a significant correlation with either of the two outcome variables.

The primary data source for this paper which includes the social indicators of interest as well as further individual characteristics is the German panel study "Labour Market and Social Security" operated by the Institute of Employment Research (Trappmann, et al. 2009). This panel study allows a link to the German "Establishment History Panel", which contains information on all establishments in Germany, including the information on firm closure (Hethey and Schmieder, 2010). Since the major variables of interest are obtained from survey questions and thus are based on individual subjective assessments, the results are validated using rather objective indicators. Variables such as the *number of doctor visits* and the *number of nights in hospital* are used for an objective validation of the individual health status, whereas the number of *close family friends* or *active volunteering in sports clubs* are used to validate the subjectively assessed measure of social inclusion.

The Wald and 2SLS estimates show a negative effect of unemployment on social inclusion which is larger than OLS coefficients (Gundert and Hohendanner, 2011). OLS estimates underestimate the true causal effect of unemployment because a large weight is put on individuals who do not suffer an adverse effect from their unemployment status. In contrast the IV estimates show just a small effect of unemployment on health and thus OLS might overestimate the effect of unemployment on health. While the IV estimates show a small statistically significant effect on the subjective health measures they fail to show any effect on the more objective health variables.

The analysis will be extended using the large German administrative data source. Using a "two sample two stage least squares" (TS2SLS) approach allows to estimate the first stage and the

second stage separately with different data samples (Inoue and Solon, 2010). Using the TS2SLS method the first stage regression will be estimated entirely with the German "Integrated Labor Market Biographies" and the second stage will be estimated using the panel study "Labour Market and Social Security".

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**Appendix**

**Preliminary Results**

OLS and IV estimates of the effect of unemployment on social inclusion and health

Dependent Variable	Mean (1)	OLS (2)	Wald			IV with covariates		2 sample IV	
			First Stage (3)	Reduced Form (4)	Wald Estimates (5)	2SLS (6)	2SLS (7)	TS2SLS (8)	
health (1-5)	2.53	0.380 (0.030)	0.220 (0.019)	0.083 (0.042)	0.376 (0.187)	0.474 (0.193)	0.419 (0.215)	will be presented at the conference	
psyc_health (1-5)	2.12	0.538 (0.037)		0.118 (0.051)	0.534 (0.227)	0.609 (0.234)	0.608 (0.262)		
soc_inc (1-10)	7.09	-2.064 (0.066)		-0.669 (0.099)	-3.013 (0.412)	-3.096 (0.431)	-2.966 (0.478)		
<i>controls</i>									
sex		yes	no	no	no	yes	yes		
migration status		yes	no	no	no	yes	yes		
age		yes	no	no	no	yes	yes		
age squared		yes	no	no	no	yes	yes		
educ (iscd)		yes	no	no	no	no	yes		

Note: For the wald estimator the first stage is the same for all three dependent variables. Standard errors are presented in parentheses.

Data: The data source is the first wave (2006-2007) of the German panel study "Labor Market and Social Security" of the Institute for Employment Research linked to the "establishment history panel" of the German Employment Agency. The number of observations is 5,106 of which all have had an employment spell in 2003.

Dependent variables: All the three dependent variables are subjective categorical measures. The *health* variable's smallest value is 1 (no health issues) and the largest is 5 (substantial health issues), The *psyc\_health* variable takes value from 1 (no health issues) to 5 (substantial health issues) and the *soc\_inc* variable is categorical on a 10-point scale where the smallest value 1 is excluded and the largest 10 is integrated.

IV: The instrument is firm closure: An indicator which takes the value 1 if an individual was affected by firm closure within the three year before the interview.

TS2SLS: The "two sample two stage least squares" (TS2SLS) estimates will be presented at the conference.

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