

Interregional Stabilisation and Redistribution by the Federal Unemployment Insurance

Kerstin Bruckmeier

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Abstract

The insurance function of federal budgets against regional asymmetric income shocks in fiscal federations is well known in the literature. Empirical studies provide estimates of the amount of stabilisation between the regions. Especially automatic stabilisers, like the unemployment insurance, show a large reaction to regional imbalances. The goal of this paper is to estimate the amount of redistribution and stabilisation between the regions in Germany on a small area level. Therefore we use quarterly data from the national unemployment insurance for the period 2000 to 2007 and analyse redistribution and stabilisation between 16 German states and on the disaggregated level of 96 German spatial planning units. Estimates for the stabilising effect are provided for expenditure on active labour market policies as well as for unemployment insurance benefits. The results indicate that unemployment insurance benefits have a strong regional stabilising effect, while expenditure on active labour market policies mainly provide regional redistribution.

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For additional information please contact:

Kerstin.Bruckmeier@iab.de

1 Introduction

The stabilising effect of federal budgets on the member states in fiscal unions has been a frequent subject in the empirical public finance literature over the past two decades (Asdrubali and Kim, 2008; Mélitz and Zumer, 2002; Asdrubali et al., 1996; Sala-i Martin and Sachs, 1992). The responsiveness of federal taxes and transfers provides an insurance against regional shocks in income. Empirical studies in this area indicate that income smoothing is an important feature of federal fiscal systems. This paper builds on previous studies that have estimated the extent to which the federal fiscal system in Germany provides an insurance against regional asymmetric shocks in income (Hepp and von Hagen, 2009; Jüßen, 2006; Büttner, 2002; Kurz, 2002).

We study the redistributive and stabilising properties of the federal unemployment insurance. The federal unemployment insurance is a federal institution which is financed by a common contribution rate across regions and provides income support and measures of active labour market policies based on a common law. The system transfers income from regions with good labour market conditions to regions with unfavourable regional labour markets. While existing empirical studies on the regional stabilising properties of the federal unemployment insurance in Germany refer only to the former 10 west German states (Büttner, 2002; Kurz, 2002), our study provides an analysis of interregional redistribution and stabilisation after German unification. Previous studies find that the federal unemployment insurance has significant stabilising and small interregional redistributive effects. It could be expected that the inclusion of the former East German regions has a notable effect on the results. Recent research provides new evidence on the stabilisation and redistributive properties of the federal fiscal system in unified Germany. Hepp and von Hagen (2009) find that the redistributive effect of the federal fiscal system has increased after the German unification. The results of Jüßen (2006) also indicate large redistributive effects. Nevertheless, there is a different sensitivity of the regions to the macro-economic cycle and additionally to income redistribution there is also a stabilising effect on regional income.

This paper provides new evidence on the regional stabilising and redistributive effects of the national unemployment insurance in Germany. In section 2

we give an overview of the institutional features of the federal unemployment insurance. In section 3 we report results on the equalisation mechanism of the federal fiscal system in Germany. Section 4 explains the data and estimation approach and presents our empirical results. We use regional data for the period 2000 to 2007 and focus on different programmes provided by the federal unemployment insurance. Estimates are presented for unemployment insurance benefits, expenditure on discretionary and non-discretionary labour market policies. Section 5 summarises and points out further research issues.

2 The Federal Unemployment Insurance: General Features and Redistributive Effects

Most empirical studies on the stabilising properties of fiscal systems deal with administrative issues only at a high level of abstraction. The underlying institutional principles that determine the stabilising properties of the fiscal system are often barely described, arguably because different policies with different objectives are analysed. The narrow focus of our paper on the federal unemployment insurance allows us to outline the most important institutional mechanism in the following.

The federal unemployment insurance system is a central part of the federal social security system. As compared to the federal social assistance for long-term unemployed, its budget is rather large. Contributions sum up to 1.2 per cent and expenditure to 1.1 per cent of GDP in 2008. The system is financed mainly by statutory contributions from employers and employees. The contributions are calculated as a percentage of the gross wages, thus individual risks are not considered. In 2008 the contribution rate was 3.3 per cent of gross wages. Due to obligatory contributions to unemployment insurance only employees are eligible for payments while self-employed and marginally employed persons have no entitlements. Unemployment benefits depend on former wage income. Unemployed persons with children are entitled to unemployment benefits of 67 per cent of their last net income and unemployed without children are entitled to 60 per cent. Unemployment insurance benefits could be paid for at least 6 months up to 24, depending

on age and duration of the former employment. Long-term unemployed are eligible to the tax financed unemployment assistance.

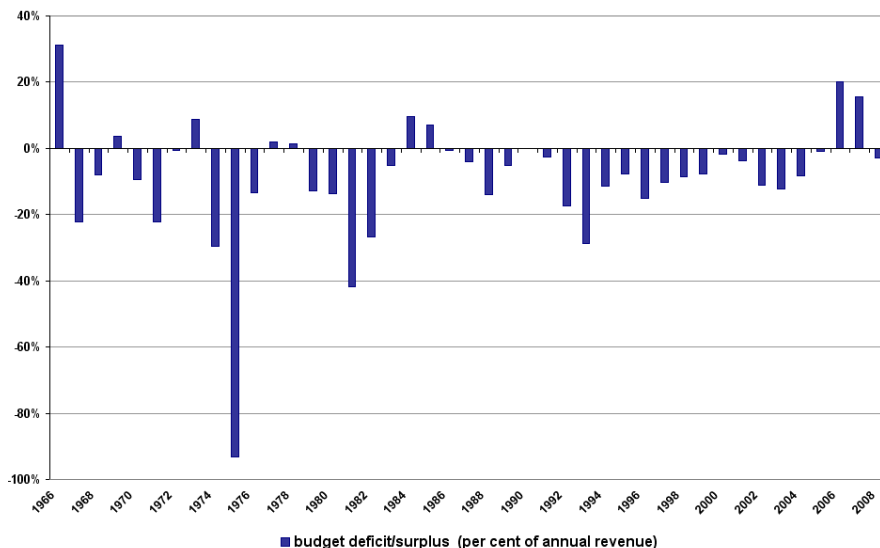
The federal unemployment insurance does not only provide insurance payments, it also provides measures of active labour market policies – e.g. training measures or integration subsidies. Measures for recipients of social assistance were also financed by the federal unemployment insurance until the year 2004. As a consequence of the implementation of major labour market reforms in Germany during the years 2003 to 2005, measures of active labour market policies for long-term unemployed persons are now financed by the federal budget. The budget for active labour market policies consists of two different parts, expenditure on discretionary and non-discretionary labour market measures. Since 1998 funds for discretionary labour market policies are formula-based distributed to the local employment offices and it is left to the local authorities to decide how to allocate the funds among the different types of measures.¹ Compared to discretionary policy measures, unemployed persons are entitled to measures of non-discretionary policies if they fulfill the eligibility requirements. In the past years before 2005 expenditure on discretionary active labour market policies dominated total funds on active labour market policies. After the implementation of the labour market reforms the relative importance has changed because the measures for long-term unemployed were mainly financed from the discretionary budget. Expenditure on discretionary policies within the budget of the unemployment insurance amounted to 2.9 billion euro and on non-discretionary policies to 7.8 billion euro in 2008. An important measure of non-discretionary labour market policies is short-time work and an example for of discretionary measures are qualification measures. While the objective of unemployment benefits and non-discretionary policies is clearly on stabilisation, the countercyclical behaviour of expenditure on discretionary policies is uncertain since the objective of these measures is often of allocative or redistributive nature. After the year 2004 the allocation procedure has changed, too. A part of the budget is now allocated on the basis of target agreements between the central office and the local units in order to improve the efficiency of allocation.

Budget deficits of the unemployment insurance are balanced by grants from

¹For a detailed description of the allocation procedure see (Blien and Hirschenauer, 2006).

the federal budget. Figure 1 shows the development of the annual budget deficit or surplus in the last 45 years.

Figure 1: Annual budget deficit/surplus of the federal unemployment insurance 1966-2008



The figure reveals the intertemporal stabilising function of the unemployment insurance and two major changes in the cyclical behaviour. First, after the German reunification not only the structure of the annual budget but also the cyclical behaviour has changed. The federal unemployment insurance became more important in the first years after the German Unification. Mackscheidt (1993) discusses the redistribution of income from West Germany to the former East Germany through the unemployment insurance and points out the significance of these transfers relative to other federal equalising institutions which provide direct financial support like federal regional policy programmes. He further emphasises that contrary to these institutions the unemployment insurance is not subject to the different interests of the federal subdivisions in the political process. There are no negotiations between the states or the states and the federal government about the amount of redistribution. There is rather a political consensus to provide common social standards in all German regions justified with the constitutional mandate to ensure equal living conditions for the citizens in all regions. As a consequence of common rules across regions, the collapsing labour markets in former East Germany and increasing long-term unemployment in the follow-

ing years, expenditure increased intensive and steadily. The budget was not any longer balanced or positive even in periods with strong economic growth, e. g. between 1998 and 2001. Additionally, the fluctuations of the annual deficit declined after 1990, which indicates stronger redistributive properties of the unemployment insurance after reunification.

The second important change followed after the year 2004. The financial development of the unemployment insurance in the years after 2004 was much influenced by the positive economic development and the major labour market reforms implemented in the years before. For the first time after reunification the budget was nearly balanced and the federal agency was able to build reserves. Before 2005 the gap between contributions and expenditure mainly reflected payments to long-term unemployed persons. Since 2005 the measures of active labour market policies for the long-term unemployed are financed by the federal budget. Another consequence of the labour market reforms is that the federal employment agency tries to improve the efficiency of the regional allocation of discretionary active labour market policy funds. Together with the strong economic upswing between 2005 and 2008, the budget showed a surplus in the years 2006 and 2007.

3 Literature

Table 1 summarises previous studies on the stabilising and redistributive effects of the federal fiscal system in Germany. Kurz (2002) and Büttner (2002) examine regional risk sharing between the west German states achieved by the federal unemployment insurance. For the period between 1970 and 2000 Büttner identifies a stabilising effect of the unemployment insurance and the tax-financed unemployment assistance of about 4,9 per cent. It means that about five percent of state-specific shocks to net social product are smoothed by the contributions towards and expenditures from the federal unemployment insurance.

Although Kurz analyses the smoothing effects on shocks in regional wage income, her empirical investigation leads to a very similar result. In her study, about 5 to 6 per cent of a shock to regional labor income is smoothed by the federal unemployment insurance. Additionally she finds that unemployment

Table 1: German empirical literature

	Büttner (2002)	Kurz (2002)	Jüßen (2006)	Hepp and von Hagen (2009)
Regions	10 west Ger- man states	7 western employment agencies	271 labour market re- gions	16 German States
Periods	1970-2000	1975-1997	1995-2002	1995-2006, 1970-94 (west)
Fiscal Flows	UI, PI, FES	UI	SI, FTax, FTr	FES
Results	UI: 4.9 %	UI: 5-6%	-1.9%	1. Red.: 38,6% (36,7% west) 2.Stab.: 19,4% (46,8% west)

UI: Federal unemployment insurance. PI: Federal pension insurance. FES: Fiscal Equalisation System. SI: Federal social insurance. Ftax: Federal taxes. FTr: Federal transfers

insurance has only a small redistributive effect on regional labour income disparities.

The study of Jüßen (2006) is of particularly interest because it makes use of disaggregated data on the level of 271 German labour market regions and it covers a time period after German unification. He finds that the federal budget has no stabilising effect at all and rather provides interregional income redistribution in favour of economically weak regions. Due to the still high economic disparities between eastern and western Germany, the strong redistributive effect is not surprising but the insignificance of the federal budget for regional stabilisation seems counter-intuitive.

A more recent study is the analysis of Hepp and von Hagen (2009). They explicitly consider the effects of German unification on fiscal equalisation. They find that income redistribution among the states has increased after German unification from 36,7 per cent to 38,6 per cent. Especially the redistribution of income among the western states increased distinctly from 37

per cent to 63 per cent. Furthermore their results show that the stabilisation properties of the federal fiscal system decreased considerably from 46.8 per cent for the period between 1970 to 1994 to only 19.4 per cent for the period between 1995 to 2006.

4 Empirical Analysis

4.1 Data

For the empirical analysis the following data sources are used:

Regional wage income

The employment statistics of the Federal Employment Agency (*Bundesagentur für Arbeit*) contains information about all 29.398 million employees that are subject to the compulsory social security scheme and their wages up to an income threshold. For every dependent employee we know the exact place of residence as well as the job location at the smallest territorial unit for administrative purposes (*Gemeinden*) in the Federal Republic of Germany.

Expenditure on unemployment insurance

The Federal Employment Agency publishes monthly expenditure on unemployment benefits as well as on active labour market policies financed by the unemployment insurance on the level of the German states.² Quarterly expenditure on the level of local employment agencies are obtained from financial controlling data of the Federal Employment Agency.

Population

Population data are taken from the German Federal Statistical Office (*Statistisches Bundesamt*).

All data are aggregated on the level of the 96 German spatial planning units (*Raumordnungsregionen*). We make use only of the wage data located at the place of residence. In this way we account for commuting linkages between the regions. Additionally, the focus on spatial planning units helps us to minimise regional consumption spillovers. Although spatial planning units

² <http://www.pub.arbeitsagentur.de/hst/services/statistik/detail/i.html?call=1>.

are also designed for administrative purposes, they show a high economic integration. Table 2 summarises basis statistics for the 16 German states on expenditure on unemployment benefits (UI Benefits), expenditure on non-discretionary active labour market policies (ALMP) and on discretionary active labour market policies (ALMP).

4.2 Estimating Stabilisation and Redistribution

We apply the approach of Bayoumi and Masson (1995) and estimate separate parameters for stabilisation and redistribution from the following equations:

$$\left(\frac{Y_i}{Y}\right) = \alpha + \beta_d \left(\frac{X_i}{X}\right) + \eta_i \quad (1)$$

$$\Delta \left(\frac{Y_i}{Y}\right)_t = \alpha_i + \beta_s \Delta \left(\frac{X_i}{X}\right)_t + u_{it} \quad (2)$$

X_i and Y_i stand for regional primary and disposable per capita income and η_i and u_{it} are random disturbance terms. All income variables are measured relative to the national average of X and Y . Thereby aggregate income changes that are not explained by relative income changes between the regions are eliminated.

Equation (1) refers to redistribution and equation (2) to stabilisation. This implicates that redistribution refers to long-run income differences and stabilisation to temporary deviations from the regional average or permanent income ($\Delta \left(\frac{Y_i}{Y}\right)_t, \Delta \left(\frac{X_i}{X}\right)_t$) which is the common notion in the literature (von Hagen, 1992). The amount of regional income redistribution is measured by $(1 - \beta_d)$. If β_d equals one a change in the relative position in regional income (X_i) does not affect the relative position in income after redistribution (Y_i) and obviously there is no regional redistribution. Mélitz and Zumer (2002) propose a general panel data framework to examine regional redistribution and stabilisation and show that the coefficients β_d and β_s are equal to the between- and within-coefficient known from panel data econometrics. They also note that the study of stabilisation has nothing to do with the formulation in first differences. However, a panel-unit-root test indicates that the levels data of equation 2 are generally nonstationary.

Table 2: Basic Statistics 2000-07, 16 German states, euro per inhabitant

Year	Variable	Average	Std. Dev.	Minimum	Maximum
2000	UI Benefits	324	170	208	608
	ALMP	183	187	85	592
	DALMP	95	77	58	257
2001	UI Benefits	335	162	214	646
	ALMP	178	178	77	562
	ALMP	102	71	68	245
2002	UI Benefits	372	129	273	613
	ALMP	170	165	72	522
	ALMP	109	66	75	249
2003	UI Benefits	386	92	294	561
	ALMP	151	149	60	476
	ALMP	110	35	89	182
2004	UI Benefits	376	83	284	535
	ALMP	112	108	44	328
	ALMP	118	29	101	184
2005	UI Benefits	343	76	275	484
	ALMP	43	43	18	143
	ALMP	121	25	104	184
2006	UI Benefits	284	57	232	392
	ALMP	36	32	19	116
	ALMP	103	20	87	156
2007	UI Benefits	210	39	173	280
	ALMP	30	21	19	77
	ALMP	93	18	78	136

Notes: UI: Unemployment insurance benefits, ALMP: Expenditure on active labour market policies, DALMP: Discretionary expenditure on active labour market policies.

Thus we apply seasonal differencing to all variables to achieve stationarity. Equation 1 is estimated by OLS and equation 2 by a within-estimator with robust standard errors to corrected for heteroscedasticity.

The choice of the income variables plays a central role in the analysis and as pointed out in Méлитz and Zumer (2002), the concepts of income before and after net transfers must agree. In our analysis we use a narrow measure of transfers since we focus only on the expenditures of the federal unemployment insurance. The unemployment insurance is principally financed by statutory contributions from employers and employees. If we assume that the burden of employers' contributions is passed entirely onto the employees, only the wages of gainfully employed persons are affected. On the expenditure side, the residents of the region derive unemployment insurance benefits and expenditure on active labour market policies. For this reasons, primary income in our analysis is defined as the sum of gross wages of persons in dependent employment. Especially when we focus on the 96 German spatial planning regions the income smoothing effect of commuting becomes important, since commuting is more important the more disaggregated the regional level is. To eliminate regional risk sharing provided by commuting we measure employees' gross wages at their place of residence. Based on gross wages, we calculate disposable income by subtracting mandatory contributions towards the unemployment insurance and adding unemployment insurance benefits and expenditure on active labour market policies.

The approach allows us to disaggregate our data to measure the effects for different budget programmes. Hence, we use three different versions of regional disposable income to account for stabilising and redistributive effects of unemployment insurance benefits, active labour market policies and discretionary active labour market policies. We estimate all equations based on data (i) for 10 west German states, (ii) for the German states and (iii) for 96 German spatial planning regions. When we focus on western Germany, we use the corresponding west German average to calculate the income variables.

4.3 Results

Table 3 presents estimates for the redistributive effect β_d corresponding to equation (1). The results reveal a strong redistributive effect for the period 2000 to 2007. About 22 per cent of relative income differences between the states are balanced out by the federal unemployment insurance. The redistributive effect of unemployment benefits is about as high as of expenditure on discretionary active labour market policies (ALMP) (10 vs. 8 per cent).

Table 3: Redistribution by the federal unemployment insurance, Eq. (1)

Transfer	β_d		
	16 states	10 western states	96 SPU
Unemployment insurance	0,78 (0,027)***	0,92 (0,015)***	0,84 (0,012)***
Unemployment benefits	0,90 (0,011)***	0,96 (0,011)***	0,92 (0,005)***
ALMP	0,86 (0,016)***	0,95 (0,012)***	0,90 (0,007)***
Discretionary ALMP	0,78 (0,027)***	0,92 (0,015)***	0,84 (0,012)***

Notes: Estimates for coefficient β_s of equation (1) using quarterly income data for the period 2000-2007. * significant at 10%; ** significant at 5%; *** significant at 1%. Cluster-robust standard errors in parentheses. SPU: 96 German spatial planning units. ALMP: Expenditure on active labour market policies.

Although unemployment benefits are only paid for a limited period of time, the redistributive effect of these transfers is not surprising. The result reflects that regions with unfavourable labour markets also range at the bottom of the wage income distribution. Column 2 shows the regression results for the 10 west German states. Again, unemployment benefits and discretionary ALMP have the same redistributive effect. However, the overall redistributive effect declines from 22 per cent to 8 per cent if we focus only on income redistribution between the 10 west German states. Due to persistent labour market disparities between eastern and western Germany, stronger redistributive properties of the unemployment insurance in united Germany could be expected and the same results for other federal fiscal systems (Hepp

and von Hagen, 2009; Jüßen, 2006). Perhaps more interesting, income redistribution between the 96 spatial planning regions is lower than between the 16 German states. The effect declines from 22 to only 16 per cent. Especially the effect of discretionary ALMP declines about 2 percentage points. This result is driven by the fact that some units, especially in the southern regions of Germany, have wage incomes per inhabitants below the German average and receive lower-than-average expenditure on ALMP per inhabitant. When we focus on state income, these observations carry less weight and all states with wage income below the national average receive disproportional high expenditure per inhabitant. One reason for this pattern is the distribution formula for the regional allocation of expenditure on discretionary ALMP. It was a basic principal of the former allocation process to allocate a fixed proportion of the budget (2002: 46 per cent) to the eastern regions (Blien and Hirschenauer, 2006). As a consequence of recent labour market reforms more emphasis is put on efficiency goals and the redistributive elements of the allocation procedure declined. When we repeat the regression on the level of the states for the period between 2005 to 2007, the effect of discretionary ALMP declines to only 2 per cent.

The empirical results presented in table 4 confirm broadly the expected stabilising effect of the unemployment insurance on regional labour income. The results indicate that in the period from 2000 to 2007 about 6 per cent of shocks to state wage income are smoothed by the federal unemployment insurance. The results for the effects of the different expenditure programmes reveal a strong effect of about 16 per cent for the unemployment insurance benefits. This is not surprising since the unemployment insurance provides temporary income support during periods of involuntary unemployment. Contrary, a decrease in regional wage income does not result in an increase in expenditure on active labour market policies. Stabilisation stems almost entirely from the unemployment insurance benefits. For discretionary active labour market policies we even find a significant negative effect. The destabilising effect of discretionary ALMP amounts to 9 per cent. In column 2 we focus only on the stabilising effects of UI on the 10 west German states. The overall stabilising effect of UI has increased to 12 per cent compared to the former results. This result is distinctly higher compared to the previous estimates of about 4 per cent obtained by the analysis of Büttner (2002) and

Kurz (2002). One explanation is the different income variables the studies refer to. Because we use a more narrow measure of primary income, a higher stabilising effect is plausible.

Table 4: Stabilisation by the federal unemployment insurance, Eq. (2)

Transfer	β_s		
	16 states	10 western states	96 SPU
Unemployment insurance	0,94 (0,040)***	0,88 (0,159)***	0,91 (0,019)***
Unemployment benefits	0,84 (0,025)***	0,88 (0,106)***	0,85 (0,013)
ALMP	0,85 (0,028)***	0,88 (0,127)***	0,86 (0,016)
Discretionary ALMP	0,94 (0,040)***	0,88 (0,159)***	0,91 (0,019)

Notes: Estimates for coefficient β_s of equation (1) using quarterly income data for the period 2000-2007. * significant at 10%; ** significant at 5%; *** significant at 1%. Cluster-robust standard errors in parentheses. SPU: 96 German spatial planning units. ALMP: Expenditure on active labour market policies.

Between the 10 western states we find no destabilising effect of discretionary ALMP, at all. For the 96 spatial planning units the results do not change dramatically. The overall stabilising effect increases slightly to 9 per cent and again stabilisation stems from unemployment insurance benefits (15 per cent).

5 Further Research

The aim of the paper was to provide estimates for the stabilising and redistributive effects of the federal unemployment insurance in Germany during the period 2000 to 2007. Our results show that the federal unemployment insurance reduces 22 per cent of interregional wage income disparities between the German states. The stabilising effect amounts to 6 per cent. Most of the stabilising effect results from unemployment insurance benefits. For expenditure on discretionary active labour market policies the results reveal

a destabilising effect. The measures of these policies are often not intended to provide short-term risk sharing but rather allocative or redistributive effects. Our data allow us to calculate regional revenues from contributions and thus further research should include the effects of financing to estimate the overall effect of the system. The results of our study are obtained under the assumption that the quarterly expenditure on unemployment insurance react to shocks in regional wage income after a period of one year. We think this is a plausible assumption since there are no budgetary, legislative or implementation lags for the unemployment insurance benefits. For expenditure on active labour market policies the responsiveness to shocks in income is ambiguous. Several econometric problems have to be considered in our further research. First, tests indicate that our panel data suffer from serial autocorrelation. Additionally, estimates may be biased because of endogeneity. Further research needs to be done to show if the empirical results are robust.

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