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Estimating the redistributive effects of the federal unemployment and pension insurance on the regional income distribution in Germany

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Abstract

The reduction of income disparities between regions is a basic target of regional policy in most advanced economies. Although expenditures on social policies are substantial parts of government spending as compared with regional policies, yet little is known about their effects on regional inequalities. In this note we show how, due to large regional economic disparities, payments from social insurance reduce interregional income disparities in Germany. We focus on the effects of the national pension and unemployment insurance. The results reveal large regional redistributive effects across regions and emphasize the need for further research on the geography of the welfare system and its impact on regional economic disparities.

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1 Introduction

In Germany as well as in the European Union, equalising cross-regional disparities in living standards is an important policy target, which is anchored in the constitution. It particularly gained importance in political discussion after the German reunification as a consequence of large economic differences between eastern and western Germany. Because of eastern Germany's ailing economy the government has provided a great deal of financial support to improve the economic situation and stabilise market income. Several systems and instruments of federal policy attempt to equalise the regional economic and financial disparities. Substantial structural funds have additionally been provided by the European Commission to equalise the living and working conditions in the two parts of Germany. Furthermore, the German welfare state influences the regional distribution of post-government income to a great extent indirectly although social policies in Germany are mainly constituted at the federal and not at the regional level. Germany's federal social security system, financed mainly by contributions, plays a decisive role in this process of indirect regional income redistribution.

In 2005 the share of contributions to social insurance in Germany was 13.9 per cent of the gross domestic product, whereas in the other OECD countries it was much lower at 9.2 per cent on average. The share of the tax revenues (as a percentage of the gross domestic product) was lower in Germany than in the OECD countries at 20.9 per cent and 26.9 per cent respectively (OECD 2007). Expenditure on social insurance amounted to almost 70 per cent of all federal expenditure on social policies in the year 2005 (Statistisches Bundesamt, 2008). Second, unlike the above mentioned instruments of direct financial support, in the political process the system of social security is not directly subject to the different interests of the federal subdivisions like states or districts. Although the German states contribute to and benefit from the social security system to a different extent, there is consensus about the basic necessity to guarantee the same amount of social insurance in all German regions.

Social services and income support in Germany are mainly provided by the federal social insurance. The three main types of social insurance are the national pension, health and unemployment insurance. Unemployment and pension insurance are the two dominant parts of the overall social system and in contrast to the national health insurance they mainly provide income support.

In this note we show how, due to large regional economic disparities, payments from social insurance reduce interregional income disparities. We focus on the effects of the national pension and unemployment insurance. Although these policies are substantial parts of government spending as compared with regional policies, yet little is known about their effects on regional inequalities and further impacts on regional development. This note is a first step in identifying the importance of the federal social security system on regional income distribution and disparities. The empirical analysis is based on data from different sources for 439 administrative districts in Germany for 2003. After a brief discussion of recent empirical literature on income distribution in Germany and the potential regional redistributive effects of social security on the spatial income distribution, we present inequality measures for the regionally earned income, followed by the results for regional income after pension and unemployment insurance.

2 Empirical literature

Studies based on survey data for individuals or households such as the German Socio-Economic Panel (SOEP) or the German Income and Expenditure Survey (EVS) (Bach et al. 2007; Gernandt and Pfeiffer 2007; Frick and Goebel 2008; Biewen 2005; Becker and Hauser

2003; Schwarze 1996) are dominated by east-west comparisons or refer to inequalities between German states.

Macroeconomic data obtained from the national account allows a focus on small-area levels like the district level. These studies, known from the convergence literature, make use of income measures like gross domestic product (GDP) per capita, gross value added (GVA) (Colavecchio et al. 2005; Brakman et al. 2004) or disposable income (Kosfeld et al. 2007; Brenke 2006). A disadvantage of these gross measures is that they are recorded at state level and disaggregated to district level by samples afterwards. This implies inaccuracies at district level. Further problems with these measures are due to time lags and changes caused by revised data.

For Germany the main results can be summarized as follows. Studies using district level data show that in the first years following German reunification, disposable income and inner-regional income disparities in eastern Germany were low and have increased since then because of high unemployment rates on the one hand and well-paid jobs on the other (Colavecchio et al. 2005). Although the national poverty rate has increased, the differences between western and eastern Germany have decreased because of public transfers to unemployed people that were three times higher in eastern Germany than in western Germany (Gatzweiler and Milbert 2003). Nonetheless, income inequalities are still greater between western German regions than between eastern German regions.

Although some studies on the small-area level distinguish between "pre-government" and "post-government" income for western and eastern Germany (Becker and Hauser 2003, Schwarze 1996), there are no spatial analyses on a small-area level that examine the effects of different welfare programmes. In contrast to comparable studies focusing on the spatial distribution of welfare expenditures (Hamnett 2009; Mackay and Williams 2005) this analysis includes the spatial distribution of both, expenditure and financing.

3 Regional redistributive effects

This section briefly discusses the potential effects of the two types of social insurance on the regional income distribution. Both pension insurance and unemployment insurance are financed mainly by statutory contributions from employers and employees. The pension insurance is a pay-as-you-go system. The contributions are calculated as a percentage of the gross wage; individual risks are not considered. In 2003 the contribution rate for pension insurance was 19.5 per cent of the gross wage and 6.5 per cent for unemployment insurance.

Due to obligatory pension and unemployment insurance contributions only employees are eligible for payments of these insurances, while the self-employed and civil servants have no entitlement. The pension payments depend on the amount of former wages and the duration of the former employment. Besides, the acknowledgement of a contribution period for parenting, and early retirement pensions are further elements of pension insurance. The unemployment benefits also depend on former income. Unemployed people with children are entitled to unemployment benefits of 67 per cent of their last net income and unemployed people without children are entitled to 60 per cent. In 2003 these benefits could be paid for a minimum of six months up to a maximum of 32 months, depending on age and duration of the previous employment. Both, the contributions to and the payments from the unemployment and pension insurance have no regional dimension per se.

Although reducing regional income inequalities is not the main aim of federal social insurance, equalising effects on regional income disparities are likely to be expected.

It can be assumed that the spatial distribution of pension payments generally depends on the age structure of the population and on the former regional wage level. Additionally, the legal approach to dealing with the employment biographies of inhabitants of the former German

Democratic Republic (GDR) after reunification influences the spatial pattern of pension payments. As a result of a generous acceptance and acknowledgement of employment periods, along with almost full employment in the former GDR and a large share of working women in contrast to the western states, up to now the average state pension is higher in the eastern part of Germany than in the western federal states. Hence, due to political and historical reasons higher transfers from the western to eastern regions are expected, enforced by high unemployment and lower wages in eastern Germany and thus lower contributions. Regions which have experienced structural change in the last few decades, such as regions which had an important mining industry in the past and are now suffering from high unemployment, are expected to have lower contributions to social insurance but higher pension payments. On the other hand, former agricultural regions in the south may have payments below and contributions above the national average.

National unemployment insurance redistributes income from individuals at low risk of unemployment to those at high risk. Across German regions the variance of the unemployment rate is very high. Whereas in July 2010 the southern states of Bavaria report low unemployment rates of around 2 per cent, respectively, the north-eastern states of Mecklenburg-Western Pomerania and Brandenburg were confronted with much higher unemployment rates of up to 16 per cent, respectively. Additionally, for political reasons the eastern part of Germany received more funds for active labour market policies than for benefit payments from unemployment insurance (Blien and Hirschenauer 2006). In 2003 expenditure on active labour market policies amounted to 20.9 billion Euros, or 37 per cent of the total budget for unemployment insurance. To sum up, unemployment insurance may show a large redistributive effect across the regions and the federal pension insurance seems to have an observable but smaller effect, since the relationship between contributions and benefits is stronger for the latter.

4 Data and methodology

The data used were obtained from different sources originating from the year 2003. The employment statistics of the Federal Employment Agency (*Bundesagentur für Arbeit*) contain information on all 29.4 million employees[1] that are subject to the compulsory social security scheme and their wages[2]. Wages above the upper earnings limit for social security contributions were estimated for each region.[3] The data also contain detailed information on the place of residence and work for every dependent employee at the smallest territorial unit for administrative purposes in the Federal Republic of Germany. With these data it is possible to assess the contributions paid towards unemployment and pension insurance by all individuals in a region. Data on expenditures were accessed from national social security agencies. These data provide information on 1.8 million recipients of unemployment benefits and 18.3 million pensioners, as well as the average payments of these insurances on the district level.

The analysis is based on the 439 administrative districts or towns with autonomous administration in Germany that are similar to the NUTS 3 units[4] (326 in western Germany and 113 in eastern Germany). Furthermore, in our study western Germany is divided into three regional groups (north, central and south) in line with the study by Frick and Goebel (2008). We compare the regional distribution of wages from dependent employment (*W*) with regional post-insurance income (*Y*) for each region *i* to measure the redistributive effect. Regional post-insurance income in our study is defined as

$$Y_{ED} = \sum_{i=1}^{n} W_i - \left(CU_i + CP_i\right) + \left(PU_i + PP_i\right) \qquad (1)$$

where *CU*, C*P* denote contributions paid towards the unemployment and pension insurance and *PU*, *PP* denote payments of unemployment insurance and pensions.
Based on individual data all income variables are aggregated on the district level and related to employees, recipients or inhabitants. Differences in mean incomes per inhabitant express regional differences in the structure of the population as well as different income levels per employee or recipient.
Regional disparities of pre- and post-insurance income are analysed with some commonly used measures of income inequality: the Gini coefficient (G), the mean logarithmic deviation (I_0), Theil's measure (I_1), half the squared coefficient of variation (I_2), the Atkinson indices ($A(e)$) and their within- and between-group components (Atkinson 1970; Shorrocks 1980).

5 Results

This section focuses on the regional formal budget incidence of unemployment and pension insurance.

Table I: Wage income, payments from and contributions to pension and unemployment insurance (in million €)

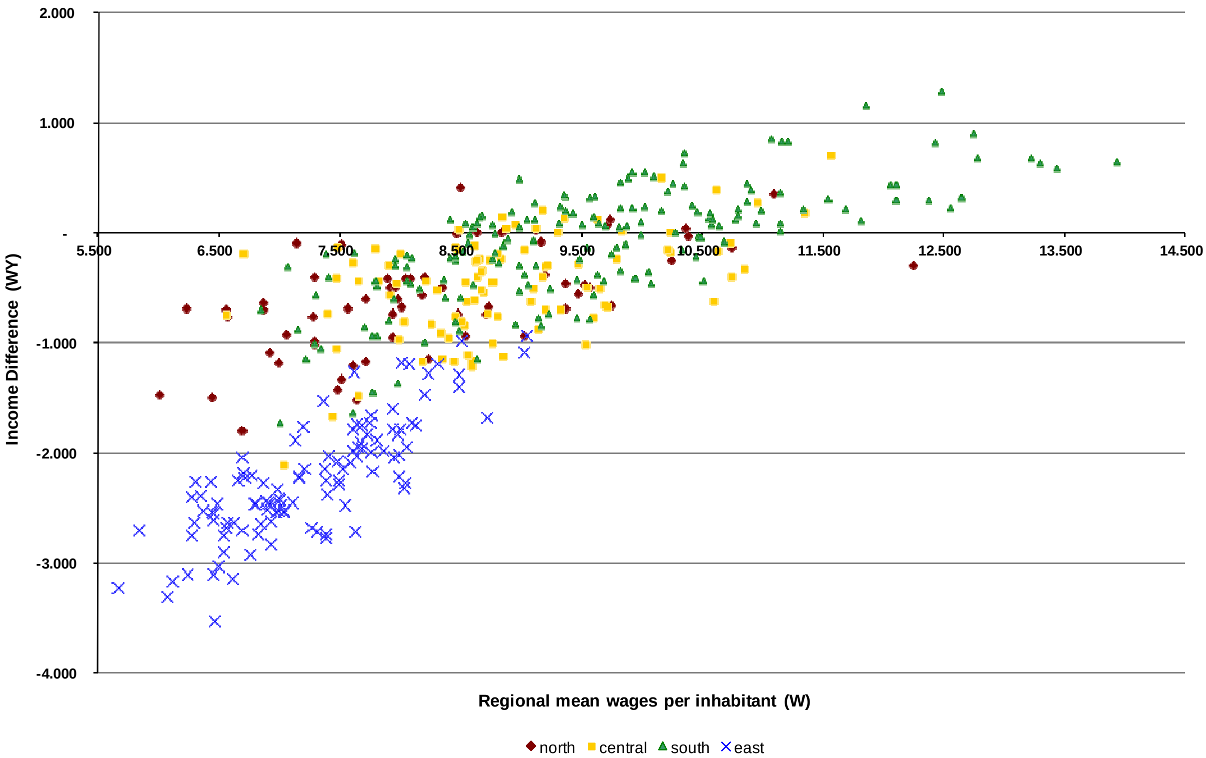
W	**Wages earned by employees**	**743,285**
CP	Contributions to state pension insurance	-169,560
CU	Contributions to unemployment insurance	-47,146
C	**= Contributions to social insurance**	**-216,706**
PP	State pension payments	+190,048
PU	Unemployment benefits	+29,048
PU	Expenditure on active labour market policies	+21,874
P	**= Social insurance benefits and payments**	**+240,970**
Y	**Income after pension and unemployment insurance**	**=758,549**

Source: Employment and unemployment statistics of the Federal Employment Agency 2003, national, statutory pension scheme 2003; authors' calculations.

In total there should be no difference between *W* and *Y* at the federal level if the budget is balanced. The difference is explained by parts of social insurance which are financed from taxes (not included in *C*) and expenditure other than benefits (not included in *P*) being disregarded.
These two factors are minor parts of the total expenditure and financing, but the tax-financed elements especially of the pension insurance are greater than the disregarded expenditure such as administration costs. Due to the fact that there is no valid information about the regional tax incidence in Germany, the regional budget incidence for pension and unemployment insurance is underestimated. It is assumed that the distribution of tax revenues is quite similar to the regional distribution of contributions to social insurance. Hence, the ranking between the regions would not change if regional contributions to total national tax revenues were taken into account (Blos 2006).
Figure 1 shows the difference between regional wage incomes and post-insurance income per inhabitant for all German districts. The general pattern shows the expected positive correlation. Regions with higher wages per inhabitant show a higher and positive difference between the two income variables. While the variance of wages per inhabitant seems high for all regions, it is lower for the income differences (between *W* and *Y*) within and between the three western regions. The pictures for the northern and central regions are particularly similar. Most regions in the south have a positive income difference and high wages. For the

three western regions the picture points to a north-south divide within western Germany. Figure 1 also shows that the eastern regions are predominantly distinct from the western regions; all of them have negative income differences and low wages per inhabitant. This means that the regional income per inhabitant is higher after the redistribution process of pension and unemployment insurance. With regard to economic disparities and the discussion about public transfers from western to eastern Germany, the result was as expected. However, there are some western regions in all three groups which are comparable to some eastern regions.

Fig. 1. Average difference between wage income (W) and income after social insurance (Y) in € per inhabitant 2003 for 439 German districts



Source: Employment and unemployment statistics of the Federal Employment Agency 2003, statutory pension scheme 2003; authors' calculations.

Table II compares the Gini coefficients of regional wages per inhabitant and income after social insurance per inhabitant for the four regional groups. In all four groups the Gini index decreases significantly. The reduction is highest for eastern Germany (-55 per cent) and lowest for the southern part of western Germany (-22 per cent). The results confirm the findings of previous studies for the distribution of wage income in Germany: Income inequalities are still stronger in the southern part of western Germany with a range from 3.42 to 13.33 and lowest in eastern Germany ranging from 0.49 to 1.97 (see Atkinson indices). Inequality within and between the groups is also lower for the new post-insurance income variable Y, especially at the bottom of the income distribution.

Table II: Decompositions of mean income per inhabitant for regional groups

Regional group	Wage income (W)	Income after social insurance (Y)						
	Gini coefficient (per cent)		Theil's Indices			Atkinson Indices		
			1000 I_0	1000 I_1	1000 I_2	1000 $A_{0.5}$	1000 A_1	1000 A_2
Germany	9.7	5.6	5.14	5.18	5.26	2.58	5.13	10.18
Eastern Germany	5.6	2.5	0.98	0.98	0.97	0.49	0.98	1.97
Western Germany	8.5	6.4	6.58	6.63	6.74	3.30	6.56	12.97
North	8.5	6.5	6.66	6.75	6.88	3.35	6.63	13.06
Central	6.1	5.1	4.27	4.23	4.21	2.12	4.26	8.59
South	8.5	6.6	6.80	6.89	7.02	3.42	6.78	13.33

Source: Employment and unemployment statistics of the Federal Employment Agency 2003, statutory pension scheme 2003; authors' calculations.
I0 = mean logarithmic deviation; I1 = Theil's measure; I2 = half the squared coefficient of variation;
A(e) = Atkinson indices with e = 0.5, 1 and 2

6 Outlook

The focus of this analysis is the redistributive effect of unemployment and pension insurance. Our findings illustrate that regional inequality in wage income was reduced substantially, with the largest reduction in eastern Germany and the lowest in the southern states. Another result is that within-group and between-group inequalities are lower for income after social insurance.

As in other European countries, the German welfare state has been facing a growing financial burden, due to high unemployment rates. In 2004 and 2005 significant reforms in the welfare system were implemented which also affected parts of the social insurance system. The results of this analysis show that changing parameters of eligibility, claims and financing may directly influence spatial disparities of post-government income (see also Blos and Schwengler 2007). In this context further research on the geography of the welfare system and its impact on regional economic inequalities is needed.

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[1] The employment statistics of the Federal Employment Agency do not include 1.7 million civil servants, soldiers and employees in military and civilian service. Although workers in marginal employment are recorded in these statistics, they were omitted from this analysis because they often do marginal part-time work in addition to a regular job, so they are sometimes recorded twice.
[2] In Germany the upper earnings’ limit for social security contributions was 61,200 Euros for western Germany and 51,000 Euros for eastern Germany in 2003. For higher wages no contributions have to be paid.
[3] A detailed description of the method used to estimate wages above the upper earnings limit for social security contributions that are not recorded can be found in Binder and Schwengler (2006).
[4] NUTS is the abbreviation of Nomenclature of Statistical Territorial Units, as reported by Eurostat.