

# Public Employment and Regional Inequality

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## Abstract

Public employment is an important instrument for regional redistribution. We analyse the incentives to use redistributive public employment from a political economy perspective. We consider the role of public employment as a redistributive tool, as well as its potential role as an insurance device for otherwise uninsurable labor market risks. If public employment is redistributive, centralisation and regional inequality both lead to less public employment. We then analyse empirically the relationship between public employment, centralisation, and regional inequality at the country, as well as at the regional level. The country level results support the view of public employment as a redistributive instrument, but the regional level provides evidence of the insurance role of public employment.

Keywords: public employment, regional inequality, median voter

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# 1 Introduction

Public employment is often regarded as an important factor for redistribution from rich to poor regions. The redistributive effects of public employment typically originate in the centralised determination of provision levels of public goods coupled with centrally determined wage levels. Given this potential for redistribution, we consider the incentives of democratically elected governments to set the level of public employment. We ask whether democratically elected governments have an incentive to use public employment as an active instrument for regional redistribution, and whether more unequal countries will be characterized by higher or lower level of public employment. Additionally we consider how these incentives will depend on the level of decentralisation. Empirically we analyse whether the theoretical predictions are in line with empirical evidence from country and regional level data from 17 European countries.

Our theoretical approach considers a median voter framework, in the tradition of Meltzer and Richard (1981) (see Persson and Tabellini (2000) for an overview). The analysis parallels the discussion of Persson and Tabellini (1994) discussing the effect of public employment as a redistributive tool. We adjust their framework and we additionally study the effects of centralisation and of regional inequality on public employment, as well as the effects of the interaction between centralisation and regional inequality. Finally, we point to the importance of the distinction between public employment as a redistributive instrument and as an instrument to insure workers from the risk of unemployment. Our theoretical framework shows that redistributive public employment implies less public employment under centralisation and less public employment in countries that are regionally more unequal. If instead public employment is considered as an insurance device, the results are turned the other way.

We then consider empirically the relationship between public employment, decentralisation and inequality. We use a dataset including regional information about 17 European countries observed within the time interval from 1995 to 2003. We find that the country level evidence largely supports the role of public employment as a redistributive instrument. More centralisation and regional inequality both lead to less public employment. The evidence at the regional level, however, arrives at some evidence for the role of public employment as an insurance device.

Our analysis relates to several other studies that have considered potential determinants of public sector employment. Several authors have identified dif-

ferent instances in which fine tuning public employment can improve welfare. For example, Rodrik (2000) argues that public sector employment provides partial insurance against otherwise undiversifiable risk and shows that public sector employment is positively correlated with countries' openness and their exposure to external shocks. Similarly, Poutvaara and Wagener (2004) make a second best argument in favor of expanding public employment to correct distortions originating from labor income taxation. Gordon (2003) develops the efficiency argument more generally and gives further instances where increased public employment may be efficiency enhancing.

Another prominent approach that is more closely related to our political economy analysis is the rent-seeking and political patronage view of public employment. It maintains that overmanning in the public sector is the result of rent-seeking activities and provides a way for politicians to channel rents to groups that serve as their power base, see Gelb, Knight and Sabot (1991).<sup>1</sup> Lopez-de-Silanes, Shleifer and Vishny (1997) find evidence that politicians create or use well-paid jobs in public enterprises to strengthen their political support. Alesina, Baquir and Easterly (2000) show that, under particular informational asymmetries, politicians can have an incentive to prefer the relatively inefficient instrument of public employment over direct redistribution towards a particular group. In particular, they demonstrate that for a sample of US cities, more personal income inequality at the city level results in more public employment at the city level. The redistributive channels of public employment, over-hiring and centrally negotiated wages, have been documented and their size estimated by Alesina et al. (2001) for the case of Italy.

Finally, a few authors have analysed public employment from a labor market perspective. Kahn (2002) considered the role of various labor market institutions for public employment. Algan et al. (2003) consider the relationship between public employment and unemployment.

We proceed as follows. In section 2 we outline the central analytical framework. In section 3 we present the dataset we are using in the empirical analysis. Section 4 considers the empirical specification. Section 5 discusses the results

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<sup>1</sup>See also Boycko, Shleifer and Vishny (1996) who argue that the political patronage view is compatible with the reductions in employment after privatisation. The reason is that the transfer of the control rights over the employment decision changes the nature of the costs of such over-employment. With the resulting increase in costs, subsidies to the privatized firms for generating additional employment are not such a desirable option as reduced profits were before.

and section 6 concludes.

## 2 A simple model

As our theoretical guidance for the empirical analysis we use a simple median voter framework of redistributive public employment. It takes up the ideas introduced by Persson and Tabellini (1994) on the effects of decentralisation on the amount of redistributive transfers. Here, we focus on public employment, however, where public employment is regarded as providing public services. This is in line with the fact that most public spending is on employment and public employment typically provides public goods such as education, health services, police and judicial services, that very labor intensive. Thus, the amount of public employment amounts to the amount of publicly provided goods. An alternative view may regard public employment as an intervention in the labor market that affect individuals' employment opportunities and wages. We discuss below how such an alternative view will change the theoretical results, and also interpret our empirical results in the light of these two functions of public employment, since the two alternative formulations give rise to opposite empirical predictions.

Consider an economy that is populated by a continuum of individuals, with a mass normalized to one. There is one private good  $x$  and a publicly provided good  $g$ . The publicly provided good is identical to the amount of public employment. Individuals preferences are given by

$$U_i = x_i + v(g), \tag{1}$$

where  $x_i$  denotes consumption of the private good by individual  $i$ ,  $g$  is the amount of publicly provided good, which we take as measuring public employment, and which is the same for everybody, and we assume  $v'(\cdot) > 0$ ,  $v''(\cdot) < 0$ . The individual budget constraint is

$$x_i = y_i (1 - t). \tag{2}$$

Thus, there is a simple linear tax scheme, so that individuals with higher income will pay higher taxes. Individuals' incomes are exogenously given and distributed according to a distribution function  $y_i = yf(\gamma_i)$  where the distribution function  $f(\gamma_i)$  has a mean of unity. Further, in line with empirically observable distribution functions, we assume that the distribution  $f(\gamma_i)$  is skewed to

the right, such that the median income  $\tilde{y} = yf(\hat{\gamma})$  is smaller than the average income  $y$ . Finally, the government's budget is given by

$$g = yt. \quad (3)$$

Substituting (2) and (3) into (1) and maximizing over  $g$  gives the individual first order conditions that implicitly define the optimal level of public employment preferred by individual  $i$ :

$$\frac{y_i}{y} = v'(g). \quad (4)$$

Low income earners prefer more public employment than high income earners, since public services redistribute from the rich to the poor. Since individual preferences are single-peaked the median voter theorem applies. Thus replacing  $y_i$  by  $\tilde{y}$  in (4) defines the level of public employment in the politico-economic equilibrium under majority voting.

## 2.1 Regionalisation

Consider now the situation in which the country under study is made up of two regions  $j, j = 1, 2$ . Let the regions be of equal size with populations normalised to one, so that the country total population is equal to two. Furthermore, let the two regions be different only with respect to their income distribution. In particular let's assume that individuals incomes  $y_{ij}$  are distributed such that  $y_{1i}(1 + \lambda)f(\cdot)$  in region 1, the rich region, and  $y_{2i} = (1 - \lambda)f(\cdot)$  in the poor region 2. Thus, the average income in region 1 is  $y_1 = (1 + \lambda)y$  and  $y_2 = (1 - \lambda)y$  in region 2. Analogously, the median income in region 1 equals  $\tilde{y}_1 = (1 + \lambda)\tilde{y}$  and the median income in region 2 is  $(1 - \lambda)\tilde{y}$ . The average income in the country is given by  $y$ . Note, however, that for the median income in the entire country  $\tilde{y}_c, \tilde{y}_c > \frac{1}{2}(1 + \lambda)\tilde{y} + \frac{1}{2}(1 - \lambda)\tilde{y} = \tilde{y}$ , since  $f(\gamma_i)$  is skewed to the right.

We can now consider what happens if financing of public employment and decision-making is completely decentralised. In this case, public employment will be determined by the respective regional median voters according to an analogous condition to (4), with median and average income now at the regional level. Note that in this case, Oates correspondence principle applies, since there are no externalities across regions and decisions are taken at the regional level. Since the regional averages and medians are just scaled by the factors  $(1 + \lambda)$  and  $(1 - \lambda)$ , respectively, these factors drop out in the ratio of median to incomes

in (4), which implies that rich and poor regions will actually employ the same number of public sector workers.<sup>2</sup>

We can now consider what happens as we move from decentralisation to centralisation.

**Proposition 1** *A move from decentralisation to centralisation will decrease the level of public employment.*

**Proof.** If the country is centralised, the average income amounts to  $y$ . If the nationwide median voter would have the average income of the two median voters, the level of public employment would remain unchanged. However, since the distribution of incomes are skewed to the right, the nationwide median voter will have a higher income than the average of the two regional median voters' incomes. Thus, the ratio of nationwide median voter to the nationwide average income in (4) will be increased, which implies lower public employment. ■

Proposition 1 replicates the result by Persson and Tabellini (1994) on redistributive taxation in terms of public provision and public employment levels. The general insight from their analysis, which comes into play here, is that the skewness of individual incomes in some sense gives more power to the richer region, which results in reduced redistribution through public employment.

## 2.2 Regional inequality

Moving beyond this result we consider now the effect of increased regional inequality on the level of public employment. Under complete regionalisation, increased inequality does not have an effect on the level of public employment. However, under centralisation we can expect an effect.

**Proposition 2** *With centralisation, the level of regional inequality affects public employment. Higher inequality will be associated with lower public employment.*

**Proof.** The proof just follows from the insight of proposition 1. The ratio of the nationwide median to the nationwide average will be increasing in the inequality of the two regions which, by (4), implies less public employment. ■

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<sup>2</sup>This effect is due to the quasi-linear nature of preferences, which is chosen to bring out our main points most clearly. In a more realistic setting, demand for public services is likely to depend positive on income levels, which is a common finding in empirical work, and which is also reflected in our empirical analysis below.

The intuition for the result is straightforward. The more uneven the regions are, the more the rich region will dominate the pooling of the votes in nationwide elections, and this will result in less public employment.

Finally, we can make a prediction on the interaction between (de)centralisation and regional inequality, based on the insight that under regionalisation there will be no effect on the model. The higher the level of decentralisation the smaller should be the positive effect of regional inequality on public employment.

**Proposition 3** *The more centralised public employment is, the stronger is the impact of inequality on the amount of public employment in the country.*

**Proof.** Assume that some parts of government activity are centralised and some are decentralised. In the present framework, an increase in inequality will decrease the number of people employed in the centralised sectors. Thus, the larger the share of centralised activities, the larger the effect of inequality on public employment. ■

It is worth pointing out that public employment may not only be regarded as redistributing via the provision of public goods. As stressed by Persson and Tabellini (1994), the effect of centralisation on the size of the redistributive government activity depends very much on the nature of the public activity. They argue that for public activity that serves as an insurance device for risk that is not insurable in private markets, the opposite result prevails, since typically the distribution of risks is structurally different from the distribution of incomes. Public employment can of course also be regarded as an insurance device that protects individuals from the risk of unemployment. In fact a simple model of public employment can easily be set up, and the predictions will just opposed to the predictions of our setting above. In particular, such a model not only predicts negative effects of decentralisation on public employment, but also positive effects of regional inequality on public employment. Thus, our empirical analysis below can also provide implicit insights as to which function of public employment is more important, the redistributive function or the insurance function.

In summary, the theoretical framework leaves us with three empirically testable predictions, if public employment takes the redistributive form as modelled above. First, centralisation should have a negative effect on public employment. Second, regional inequality should have a negative effect on public employment. Third, the interaction of decentralisation with regional inequality should have a positive effect on the level of public employment. If the insurance

function of public employment is dominant, however, we should see opposite results for the relationship between public employment, regional inequality, and centralisation.

### 3 Data

We use a dataset including regional information about 17 European countries observed within the time interval from 1995 to 2003. The countries are: Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Portugal, Poland, Slovakia, Spain, Sweden and United Kingdom. The total number of regions is 262 and the regional unit we observe is the NUTS2 corresponding to the nomenclature used by Eurostat.<sup>3</sup> The main variables we consider are: public employment, private employment, GDP per capita, population and centralization of government decisions about public employment. The main source of the data is the Eurostat Regio database. We supplement these data with country-level information on the share of public employment which is set at the different levels of administration (central, regional or local). This information comes from the ILO Public Sector Pay and Employment database (PSPE). While public employment, private employment, GDP per capita and population data are available at both country and regional level, the centralisation measure is only country specific.

Regional inequality is measured in terms of GDP per capita data in purchasing powers standards (PPS). GDP in PPS represents an identical volume of goods and services in each country, irrespective of price level. We use these data not only because they provide a better approximation for regional wealth than data in euro, but also because GDP in PPS is officially used to recognise the eligibility of regions to be supported by the EU structural funds. Moreover, GDP per capita is a measure of wealth which is not affected by redistributive instruments (contrarily to, for example, per capita income, which covers the benefits from the social security system). The main disadvantage with the use of GDP per capita in computing regional disparities arises from the existence of commuters between sub-national jurisdictions. For example, in big cities there are many employees who work inside the town and commute from other jurisdictions: this distorts the regional disparity measure, which results to be

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<sup>3</sup>The remaining European countries are not included since there are not enough information at NUTS2 level to compute reliable measures of regional inequality.

overestimated. To cope with this problem, we use the NUTS2 level classification, since at this territorial level the total number of commuters is minimized. Tables 1 and 2 show the summary statistics of the main variables we use in our sample, at both country and regional level.

## 4 Empirical specification

We perform our empirical analysis focussing on the evidence at both country and regional level. Having rich longitudinal and time series information, we use panel data techniques. We regress pooled specifications, as well as fixed and random effects specifications.

At country level, we estimate equations of the following form (in the most complete specification we focus on):

$$\begin{aligned}
 PUBL\_Empl_{jt} = & a_0 + a_1 Inequal_{jt}^C + a_2 Centr_{jt} + \\
 & + a_3 (Inequal_{jt}^C * Centr_{jt}) + a_4 PRIV\_Empl_{jt} + \\
 & + a_5 DepRatio_{jt} + a_6 GDP_{jt}^C + t_t + c_j + e_{jt}
 \end{aligned}$$

where  $j$  denotes the country and  $t$  the time period.  $PUBL\_Empl$  ( $PRIV\_Empl$ ) is a measure of the share of public (private) employment. We consider public (private) employment with respect to working age population.  $Inequal^C$  is a measure of regional disparity at country level. We measure inequality at country level by the coefficient of variation and the Gini index, using GDP per capita in PPS at NUTS2 level as the indicator variable. The coefficient of variation is adjusted for the population share of the region with respect to the country population. The Gini index is adjusted for the number of regions in each country. The reason why we use a population weighted coefficient of variation is that if the population is distributed unequally among regions the measure of inequality can be biased. Indeed, if a country has regions with very different population levels and very different levels of GDP per capita, an inequality measure would show a high disparity, although the disparity does not always affect a lot of people. A similar reasoning holds for the Gini index adjusted for the number of regions, which is crucial to perform proper inequality comparisons with regional data (see e.g. Deltas, 2003).<sup>4</sup>  $Centr$  is the share of public employment which

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<sup>4</sup>The most common inequality measures include the standard deviation, the standard deviation of the natural logarithms, the coefficient of variation, the Gini coefficient, the Herfindahl

is set at the central level of administration with respect to total public employment.  $Inequal^C * Centr$  is the interaction term between the inequality measure and the centralization measure.  $DepRatio$  is the (young) dependency ratio, calculated as the percentage of young over working age population.  $GDP^C$  is GDP per capita at country level.  $c$  is a country effect,  $t$  is a time effect and  $e$  is the error term.

At regional level, we estimate equations that have the same structure of the regressions at country level. In particular, we estimate equations of the following form (in the most complete specification we focus on):

$$\begin{aligned} PUBL\_Empl_{ijt} = & \beta_0 + \beta_1 Inequal_{ijt}^R + \beta_2 Centr_{jt} + \\ & + \beta_3 (Inequal_{ijt}^R * Centr_{jt}) + \beta_4 PRIV\_Empl_{ijt} + \\ & + \beta_5 DepRatio_{ijt} + t_t + r_i + \varepsilon_{ijt} \end{aligned}$$

where  $i$  denotes the region,  $j$  denotes the country and  $t$  the time period. The variables with the same names have the same definition as before.  $Inequal^R$  is the measure of inequality at regional level and it is defined as the (normalized) deviation of GDP per capita at regional level from GDP per capita at country level (i.e.  $(GDP^R - GDP^C)/GDP^R$ , where  $GDP$  is GDP per capita).<sup>5</sup>  $r$  is a regional effect.

## 5 Results

Tables 3-6 illustrate the results of our empirical analysis at country level. Table 3 shows the most parsimonious specification we focus on. Here, the covariates are the inequality index, private employment per capita, the dependency ratio and GDP per capita. The table presents a pooled, a fixed effects and a random effects specification. As the results show, the effect of the two inequality measures we adopt (coefficient of variation and Gini index) is always negative and significant. Disparity among regions unambiguously reduces country-level public employment per capita. Private employment per capita, the dependency ratio and GDP per capita are all positive and significant. The positive effects

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Index, and the Theil Index of inequality. In the literature it is well known that different inequality measures do not always provide an unambiguous country ranking (see e.g. OECD 2003).

<sup>5</sup>The reason why we do not use the same measures of inequality we use at country level (i.e. coefficient of variation and Gini index) is that for the countries in our sample there are not enough information on GDP per capita and population at NUTS3 level to compute them.

of GDP per capita and of the dependency ratio can be interpreted as reflecting demand effects for public goods and services. This is well in line with other Wagner’s law and wide empirical evidence from other studies. The effect of private sector employment may reflect the lower individual tax burden on workers as their share in the financing of public goods is reduced when the financing can be shared between more individuals.

Table 4 shows an intermediate specification. Here, we add the centralisation measure. The results show that centralisation has always a negative effect on public employment, although significant only in the pooled specification. The results on the other variables are in line with the findings of the most parsimonious specification.

Table 5 illustrates our country-level full specification. Here, we add to the covariates of the previous table the interaction effect between inequality and centralization. Since this specification is the focus of our empirical analysis, we perform some tests to verify which is the more appropriate empirical framework (pooled, fixed effects or random effects). Using the coefficient of variation as inequality measure, the F-test that all fixed effects are significant tells us that the pooled specification should be rejected in favour of the fixed effects specification ( $F(14,61) = 12.11$ ). The Breusch and Pagan Lagrangian multiplier test for random effects tells us that the pooled specification should be rejected in favour of the random effects specification ( $\chi^2(1) = 185.14$ ). Finally, the Hausman test shows that the fixed effects specification should be rejected in favour of the random effects specification ( $\chi^2(13) = 17.99$ ). Using the Gini index as inequality measure, the F-test that all fixed effects are significant rejects the pooled specification in favour of the fixed effects specification, the Breusch and Pagan Lagrangian test rejects the pooled specification in favour of the random effects specification, and the Hausman test rejects the fixed effects in favour of the random effects specification.<sup>6</sup> Since with both inequality measures the fixed effects specification is rejected in favour of the random effects specification, we choose to focus on the random effects specification for our comments.

As the results show, both the inequality measures have a negative and significant sign and the centralisation measure has a negative and significant sign as well. This supports the implications of the political economy framework that we considered in section 2. All the other variables follow the evolution of the previous specifications, although here private employment per capita is positive

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<sup>6</sup>The details about the results of the tests are available upon request.

but not significant. However, the interaction term is positive and significant which is at odds with the theoretical perspective. This points to the fact that empirically other factors, such as income and structural effects, are likely to be connected to the interplay between centralisation and inequality.<sup>7</sup>

The results of the analysis at regional level is shown in Table 6, which illustrates the results of our full specification (i.e. interaction term between inequality and centralization included). Again, we show the results of the pooled, fixed effects and random effects specification, then we choose among them on the basis of the results of the appropriate specification test. Here, the F-test that all fixed effects are significant tells us that the pooled specification should be rejected in favour of the fixed effects specification. The Breusch and Pagan Lagrangian test rejects the pooled specification in favour of the random effects specification. Finally, the Hausman test rejects the random effects specification in favour of the fixed effects specification. We then choose to focus on the fixed effects specification for our comments. As the results show, inequality (here measured in terms of (normalized) deviation of GDP per capita at regional level from GDP per capita at country level) has a negative effect on public employment. Again, this results is in line with the previous suggestions. The centralization measure however has here a positive and a significant effect. These evidence at the regional level points to the possibility that the insurance function is actually more important than the redistribution function. All the other variables have the signs predicted from the previous analysis, and are all significant.

## 6 Conclusion

We have developed a political economy perspective on public employment in a baseline median voter framework. In particular, we show that centralisation and regional inequality result in less public employment if public employment is redistributive. The findings are reversed if public employment serves as an insurance device. Our preliminary empirical evidence shows that both functions may be important. The country level results point at the importance of the redistribution function. More inequality and more centralisation at the country level are associated with less public employment. The regional level analysis

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<sup>7</sup>To further check the robustness of our results, we also run our regressions using a different definition of working age population (15-64 instead of 25-64, which that is used here) and alternative definitions of dependency ratios.

supports instead the view of public employment may be used as an instrument to provide insurance against labor market risk.

## References

- [1] Alesina, Alberto, Stephan Danninger, and Massimo V. Rostagno, 2001, Redistribution through public employment: The case of Italy, IMF Staff Papers, 48(3), 447-473.
- [2] Alesina, Alberto, Reza Baqir, and William Easterly, 2000, Redistributive public employment, Journal of Urban Economics, 48(2), 219-241.
- [3] Algan, Yann, Pierre Cahuc and André Zylberberg, 2002, Public employment and labor market performance, Economic Policy, 17(34), 8-65.
- [4] Gelb, A., J.B. Knight and R.H. Sabot, 1991, Public sector employment, rent-seeking and economic growth, Economic Journal, 101, 1186-1199.
- [5] Deltas, G. (2003) "The Small-Sample Bias of the Gini Coefficient: Results and Implications for Empirical Research," The Review of Economics and Statistics, MIT Press, vol. 85(1), pages 226-234.
- [6] Gordon, Roger H., 2003, Taxes and privatization, in: Cnossen, Sijbren and Hans-Werner Sinn (eds.), Public finance and public policy in the new century, MIT press, Cambridge (Mass.), 185-211.
- [7] Kahn, Lawrence, 2002, The Impact of Wage-Setting Institutions on the Incidence of Public Employment in the OECD: 1960-98, CESifo Working paper No. 757.
- [8] OECD (2003) Geographic Concentration and Territorial Disparity in OECD Countries, OECD Working Party on Territorial Indicators, Paris.
- [9] Persson, Torsten and Tabellini, Guido, 1996, Federal Fiscal Constitutions: Risk Sharing and Redistribution, Journal of Political Economy, 104(5), 979-1009.
- [10] Persson, Torsten and Tabellini, Guido, 2000, Political Economics - Explaining economic policy, MIT Press, Cambridge, MA.

- [11] Lopez-de-Silanes, Florencio, Andrei Shleifer and Robert W. Vishny, 1997, Privatization in the United States, *RAND Journal of Economics*, 28(3), 447-471.
- [12] Poutvaara, Panu, and Andreas Wagener, 2004, Why is the public sector more labor-intensive? A distortionary tax argument, *IZA Discussion Paper No. 1413*.
- [13] Rodriguez, F. (2004) *Inequality, Redistribution, And Rent-Seeking*, *Economics and Politics*, Blackwell Publishing, vol. 16, pages 287-320.
- [14] Rodrik, Dani, 2000, What drives employment in developing countries?, *Review of Development Economics*, 4(3), 229-243.

**Table 1. Summary statistics (country level)**

Variable	Obs	Mean	Std. Dev.	Min	Max
Country_id	153	9	4.915	1	17
Year	153	1999	2.590	1995	2003
Number of regions	153	14.412	10.768	2	40
GDP p.c.	153	18.016	5.750	6.311	29.161
Coefficient of variation	153	27.469	9.401	12.863	52.022
Gini coefficient	153	14.732	5.431	6.281	32.004
Centralization	108	47.317	24.013	17.924	106.118
Dependency ratio	143	24.480	2.911	19.259	34.067
Public Empl. p.c.	122	21.864	5.032	12.847	35.687
Private Empl. p.c.	123	22.797	4.942	15.444	39.214

**Table 2. Summary statistics (regional level)**

Variable	Obs	Mean	Std. Dev.	Min	Max
Nuts2_id	2205	129.257	75.948	1	262
Country_id	2205	8.992	5.091	1	17
Year	2205	1999	2.583	1995	2003
GDP p.c. deviation	1906	-0.006	2.742	-8.250	17.658
GDP p.c. (regional)	2173	18.126	6.729	4.819	60.342
GDP p.c. (country)	2205	19.038	5.007	6.311	29.161
Centralization	1836	42.621	19.036	17.924	106.118
Dependency ratio	2025	23.771	3.437	14.080	44.764
Population share	1937	7.195	8.412	0.154	73.648
Public Empl. p.c.	1758	22.392	6.026	8.317	48.219
Private Empl. p.c.	1824	21.468	6.497	7.301	44.022

**Table 3. Country level results: Most parsimonious specification**

<b>Dependent variable is Public employment p.c.</b>						
	<b>Pooled</b>	<b>Fixed Effects</b>	<b>Random Effects</b>	<b>Pooled</b>	<b>Fixed Effects</b>	<b>Random Effects</b>
Coefficient of variation	0.042 (0.451)	-0.063** (-2.583)	-0.065*** (-2.761)			
Gini coefficient				-0.141 (-0.470)	-0.051 (-1.093)	-0.068 (-1.520)
Private empl. p. c.	0.091 (0.693)	0.130*** (3.280)	0.119*** (3.139)	0.157 (0.878)	0.134*** (3.279)	0.118*** (3.027)
Dependency ratio	-0.034 (-0.129)	0.393*** (5.717)	0.373*** (5.628)	0.071 (0.218)	0.429*** (6.222)	0.402*** (6.012)
GDP Per Capita	0.658*** (3.714)	0.265*** (4.546)	0.289*** (5.269)	0.626*** (3.166)	0.276*** (4.478)	0.314*** (5.446)
Constant	6.109 (0.567)	4.147* (1.676)	4.516* (1.659)	5.548 (0.465)	1.758 (0.755)	2.358 (0.920)
Observations	122	122	122	122	122	122
Group		17	17		17	17
F-stat	11.468	20.299		13.428	18.758	
R2 within		0.724	0.723		0.708	0.706
R2 between		0.093	0.130		0.097	0.174
R2 overall		0.124	0.161		0.117	0.190
F for u <sub>i</sub> =0		666.122			616.971	
Time effects	Yes	Yes	Yes	Yes	Yes	Yes

Legend: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

**Table 4. Country level results: Intermediate specification**

<b>Dependent variable is Public employment p.c.</b>						
	<b>Pooled</b>	<b>Fixed Effects</b>	<b>Random Effects</b>	<b>Pooled</b>	<b>Fixed Effects</b>	<b>Random Effects</b>
Coefficient of variation	-0.158 (-0.989)	-0.072*** (-2.904)	-0.075*** (-2.947)			
Centralization	-0.158** (-2.519)	0.004 (0.351)	-0.002 (-0.161)	-0.140*** (-4.701)	0.010 (0.796)	-0.000 (-0.005)
Gini coefficient				-0.545* (-2.183)	-0.083 (-1.648)	-0.117** (-2.251)
Private empl. p. c.	0.286 (1.671)	0.047 (0.916)	0.051 (0.991)	0.274*** (3.251)	0.039 (0.726)	0.044 (0.813)
Dependency ratio	0.386 (1.736)	0.252** (2.506)	0.271*** (2.670)	0.608** (2.485)	0.250** (2.382)	0.281*** (2.625)
GDP Per Capita	0.520*** (5.454)	0.232*** (4.020)	0.260*** (4.481)	0.594*** (5.976)	0.245*** (3.891)	0.296*** (4.697)
Constant	4.585 (0.848)	11.184*** (3.181)	10.458*** (2.792)	-0.269 (-0.064)	10.108*** (2.780)	9.047** (2.347)
Observations	87	87	87	87	87	87
Group		12	12		12	12
F-stat	.	12.650		.	11.236	
R2 within		0.726	0.724		0.702	0.696
R2 between		0.082	0.128		0.133	0.259
R2 overall		0.123	0.182		0.160	0.310
F for u <sub>i</sub> =0		469.821			284.273	
Time effects	Yes	Yes	Yes	Yes	Yes	Yes

Legend: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

**Table 5. Country level results: Full specification**

Dependent variable is Public employment p.c.						
	Pooled	Fixed Effects	Random Effects	Pooled	Fixed Effects	Random Effects
Coefficient of variation	-0.270 (-0.662)	-0.130*** (-2.766)	-0.136*** (-2.911)			
Centralization	-0.226 (-0.995)	-0.035 (-1.181)	-0.041 (-1.416)	-0.267* (-1.994)	-0.067** (-2.189)	-0.062** (-2.056)
Coeff. of var. X Centraliz.	0.003 (0.339)	0.001 (1.459)	0.002 (1.564)			
Gini coefficient				-0.910 (-1.764)	-0.350*** (-3.226)	-0.336*** (-3.100)
Gini coeff. X Centraliz.				0.010 (1.041)	0.006*** (2.743)	0.005** (2.429)
Private empl. p. c.	0.161 (0.381)	0.020 (0.377)	0.020 (0.383)	0.154* (2.015)	0.041 (0.817)	0.039 (0.776)
Dependency ratio	0.389 (1.770)	0.224** (2.211)	0.235** (2.369)	0.384 (1.523)	0.243** (2.440)	0.255*** (2.578)
GDP Per Capita	0.482*** (3.357)	0.192*** (3.033)	0.208*** (3.374)	0.437** (2.437)	0.085 (1.014)	0.135* (1.672)
Constant	10.619 (0.602)	15.090*** (3.435)	14.924*** (3.286)	16.892 (1.045)	17.020*** (3.977)	15.990*** (3.543)
Observations	87	87	87	87	87	87
Group		12	12		12	12
F-stat	.	12.112		.	12.069	
R2 within		0.735	0.735		0.735	0.732
R2 between		0.106	0.141		0.024	0.083
R2 overall		0.161	0.207		0.041	0.111
F for u_i=0		473.091			298.346	
Time effects	Yes	Yes	Yes	Yes	Yes	Yes

Legend: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

**Table 6. Regional level results: Full specification**

<b>Dependent variable is Public employment p. c.</b>			
	<b>Pooled</b>	<b>Fixed Effects</b>	<b>Random Effects</b>
GDP p.c. deviation	0.891 (1.681)	-0.232*** (-3.099)	-0.031 (-0.414)
Centralization	-0.166*** (-3.295)	0.025*** (4.902)	0.012** (2.342)
GDP p.c. dev. X Centraliz.	-0.005 (-0.624)	-0.002* (-1.672)	-0.001 (-0.968)
Private empl. p. c.	-0.085 (-1.159)	0.067*** (4.432)	0.062*** (3.981)
Dependency ratio	0.251 (1.097)	0.200*** (5.163)	0.234*** (6.059)
Constant	24.321*** (3.898)	15.438*** (13.583)	15.580*** (13.065)
Observations	1389	1389	1389
Group		198	198
F-stat	.	69.343	
R2 within		0.434	0.425
R2 between		0.103	0.024
R2 overall		0.098	0.024
F for u <sub>i</sub> =0		373.123	
Time effects	Yes	Yes	Yes

Legend: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01