THE DRIVERS OF WAGE INEQUALITY ACROSS EUROPE: A RECENTERED INFLUENCE FUNCTION REGRESSION APPROACH

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ABSTRACT

This study analyzes the impact of individual characteristics as well as occupation and industry on male wage inequality in nine European countries. Unlike previous studies, we consider regression models for five inequality measures and employ the recentered influence function regression method proposed by Firpo et al. (2009) to test directly the influence of covariates on inequality. We conclude that there is heterogeneity in the effects of covariates on inequality across countries and throughout wage distribution. Heterogeneity among countries is more evident in education and experience whereas occupation and industry characteristics as well as holding a supervisory position reveal more similar effects. Our results are compatible with the skill biased technological change, rapid rise in the integration of trade and financial markets as well as explanations related to the increase of the remunerative package of top executives.

Keywords: inequality, inequality index, recentered influence function.

JEL Classification: C21; D31; J01.

I. Introduction

Inequality is an important topic in Economics and the issue has regained interest since the eighties as several studies reported an increase in earnings inequality for Anglo-Saxon countries (Lemieux, 2008). The trend towards greater inequality continued in the 1990s and 2000s, spreading to other countries, particularly in Europe, although with differences (Lemieux, 2008, Autor et al. 2008). In the case of Europe, recent studies have also documented great heterogeneity concerning levels of earnings inequality among countries, suggesting that the most unequal earnings can be observed in Portugal and Eastern European countries, while more compressed earnings distributions are found in Scandinavian countries (Dreger et al., 2015 ; Van Kerm and Pi Alperin, 2010).

An increasing number of studies have investigated the determinants of inequality as well as its persistence. Most studies have considered individual countries, mainly the US and the UK (e.g., Card and DiNardo, 2002; Autor et al., 2008; Lemieux et al., 2009, Machin, 1997; Dickens and Manning, 2004; Lindley and Machin, 2013), but others have analysed international differences in inequality (e.g., Leuven et al., 2004; Martins and Pereira, 2004; Cholezas and Tsakloglou, 2009; Simón, 2010; Budría and Pereira, 2011; Founier and Koske, 2012). This literature has put forward two main explanations for increasing earnings inequality: the demand and supply of skilled workers as a result of globalization and skill biased technological change and differences in institutional settings.

In spite of the observed heterogeneity in inequality in Europe, not many studies using micro data have provided comparative analysis about the determinants of wage inequality in European countries. Moreover, typically, these studies have taken an indirect and partial approach. In fact,

some estimate wage equations and analyze the determinants of earnings at different points of the distribution, therefore deducing (indirectly) the determinants of overall earnings inequality (e.g., Martins and Pereira, 2004; Budria and Pereira, 2011). Others, such as Simón (2010) or Chozelas and Tsakloglou (2009), try to establish a direct relation between inequality and its determinants by performing a decomposition of inequality indexes, but fail to analyze how this relationship changes along the distribution.

This paper aims to increase knowledge about wage inequality in Europe, by investigating the direct influence of several microeconomic characteristics (individual, occupational and industry) on wage inequality levels within countries and how this influence changes along the wage distribution. To perform this analysis, we estimate regression models for the determinants of several inequality measures: the Gini index, the variance and the 90-10, 90-50 and 50-10 log wage gaps. These regression models derive from the recentered influence function (RIF) regression method proposed by Firpo et al. (2009). This methodology allows estimation of the impact of small changes on covariates on the entire (unconditional) distribution of the dependent variable (the inequality index). To the best of our knowledge, this is the first study presenting regression models for log-wage gaps and testing directly inequality determinants on the set of inequality measures presented. This analysis provides a better understanding about the direct influence of microeconomic characteristics on wage inequality and how this influence changes along the wage distribution.

We employ micro data on male workers from the *European Union Statistics on Income and Living Conditions* (EU-SILC) for 2008 for a set of nine European countries (including both high inequality and low inequality countries). Our findings show that there is heterogeneity as regards the

determinants of inequality across European countries, which is consistent with previous literature (e.g., Simon,2010 or Chozelas and Tsakloglou, 2009).However, our results also show that the impact of covariates is not the same for the various inequality measures. In fact, in addition to previous studies, the results from the percentile log wage gaps regressions reveal that, in general, the effect of covariates on inequality changes along the wage distribution and from one country to another. This confirms the importance of using different inequality indexes as they weigh different parts of the wage distribution differently[1] (Melly, 2005).

In particular, adding previous literature, we conclude that heterogeneity across countries is more evident regarding the effect of education and experience (seniority) on inequality. The contribution of seniority to increased inequality is more apparent in poor countries, where there is a higher share of low qualified workers. University education and especially secondary education contribute to increased (decreased) inequality in countries where there is a lower (higher) percentage of workers with these characteristics. Therefore, these results may justify investment in education to reduce wage inequality directly, but also indirectly through lessening the contribution of seniority components to pay and inequality.

The effects on inequality of the occupational structure and industry characteristics as well as holding a supervisory position are more homogeneous among countries than in the case of education and experience. The impact of these covariates on inequality varies mainly according to industry and occupation. In general, the top categories of the occupational structure contribute to increased inequality. However, there are coefficient differences among countries as regards

[1]The variance of logarithm of earnings is more sensitive to changes close to the bottom of the distribution, whereas the Gini Index is more sensitive to changes around the Median (Cowell, 2000; Lambert, 2001)

the effect of these covariates. Therefore, there is heterogeneity in the magnitude of the impact, but not regarding its direction.

In addition to previous literature, our results also show which industrial sectors contribute to increased wage inequality, namely the highest and lowest paying industries. So inequality is also a consequence of countries' industrial specialization. Finally, working in the public sector or being a native worker, in general, are not relevant factors in explaining wage inequality. The results regarding education, industry and occupational structure are compatible with the skill biased technological change, rapid rise in the integration of trade and financial markets as well as explanations related to the increase in top executives' remunerative packages.

The paper is organized as follows. The next section presents the methodology used in the paper. Section 3 presents and analyzes the main characteristics of the data. Section 4 presents the results and finally, Section 5 concludes.

2. Methodology

The method used in this paper is based on the recentered influence function (RIF) regression approach developed by Firpo et al. (2009) and Firpo et al (2007). The RIF is defined as:

$$RIF\left(y;v\right)=v\left(F\right)+IF\left(y;v\right) \quad (1)$$

$v(F)$ is a distributional statistic (ex: mean, variance, quantile, etc.) and $IF(y;v)$ is the influence function (Hampel, 1974) associated with $v(F)$. The influence function represents the influence of an individual observation on the distributional statistic. It can be shown that:

$$\int_{-\infty}^{+\infty} IF(y;v)\,dF(y) = 0 \tag{2}$$

This method is usually applied to a quantile (unconditional) regression problem, but can be easily extended to other distributional statistics, such as the variance or the Gini index, provided that the influence function of these distributional statistics is known. Hence, we have the following RIF (Firpo et. al, 2007):

a) for quantiles:

$$RIF(y;Q_\tau) = Q_\tau + \frac{\tau - \mathrm{I}(y \le Q_\tau)}{f_y(Q_\tau)} \tag{3}$$

Where $f_y(Q_\tau)$ is the marginal density of *y* at the point Q_τ estimated by kernel methods; Q_τ is the sample quantile; $I(y \le Q_\tau)$ is an indicator function indicating whether the value of the outcome variable is below Q_τ.

The influence function for an inter-quantile range is given by the difference of the influence functions at both quantiles (Andersen, 2008). Hence, for any *q*-quantile range given by:

$$QR_q = y_{1-q} - y_q, \ \ where\ 0 < q < 0.5$$

$$RIF(y;QR) = QR_q + \begin{cases} \dfrac{1}{f(y_q)} - C & if\ \ y < y_q \ \ or \ \ y > y_{1-q} \\ -C & if\ \ y_q \le y \le y_{1-q} \end{cases} \tag{4}$$

Where:

$$C = q\left\{\frac{1}{f\left(y_q\right)} + \frac{1}{f\left(y_{1-q}\right)}\right\}$$

QR_q is the sample quantile range ($y_{1-q} - y_q$) of the distribution of y (wages).

b) for the variance (σ^2):

$$RIF(y;\sigma^2) = \left(y - \int z.dF_y(z)\right)^2 = \left(y-u\right)^2 \quad (5)$$

u : is the sample mean of y

c) for the Gini index:

$$RIF\left(y;Gini\right) = 1 + B2(F_y)y + C_2\left(y;F_y\right) \quad (6)$$

Where

$$B_2\left(F_Y\right) = 2\mu^{-2}R(F_y)$$
$$C_2\left(y;F_Y\right) = -2\mu^{-1}\left[y\left[1-p(y)\right] + GL\left(p\left(y\right);F_y\right)\right]$$

And $R\left(F_Y\right) = \int_0^1 GL\left(p;F_Y\right)dp$ with $p\left(y\right) = F_Y\left(y\right)$ and where $GL\left(p;F_y\right)$ the generalized Lorenz ordinate of F_Y is given by $GL\left(p;F_y\right) = \int_{-\infty}^{F^{-1}(p)} zdF_y\left(z\right)$.Further details can be found in Firpo et al. (2007).

In this paper we estimate RIF regression models for the variance, Gini index and for the following percentile log wage gaps: 90-10, 90-50 and 50-10. Hence, for each inequality measure an RIF is estimated according to the procedures presented in equations (1) to (6). Then, in a second step, as proposed by Firpo et al. (2009), we run an OLS regression of a new transformed dependent variable – the RIF for the various distributional statistics – on the explanatory variables. The standard errors of the estimated parameters are obtained by using the bootstrap procedure with 100 replications.

3. The data

We use data from *The European Union Statistics on Income and Living Conditions* (EU-SILC) for the 2008 cross-sectional dataset. We considered this year to avoid our analysis being influenced by the major impacts of the financial crisis and the fiscal adjustment programs in several countries which occurred after 2008. EU-SILC is an annual survey from EUROSTAT, starting in 2004, which provides comparable data for the European Union on income, poverty, social exclusion and living conditions. The survey also provides information on workers' and other labor market characteristics such as industry and occupation.

Our sample comprises full-time male employees aged 18 to 64 years old. Workers in agriculture and fisheries, the self-employed, unpaid family workers and apprentices were excluded from the sample. Finally, sample weights were applied in order to ensure sample representativeness. Focusing on full-time male employees reduces the risks of comparability problems resulting from different shares of part-time employment in different countries, differences in female labor market

participation and different discriminatory practices in relation to women. Moreover, as Atinson et al. (2016) show, income from self-employment is not very reliable in EU-SILC when compared to national accounts.

Hourly wages are computed dividing the gross amount received by employees in the main job, before tax and social insurance contributions are deducted, by the number of hours of work. Overtime pay, tips and commission as well as supplementary payments (13th and 14th month, holiday payments) are included on a monthly proportional basis. This information is available only for a limited group of countries, so we consider in our analysis the following countries: Austria (AT), Greece (GR), Spain (ES), Hungary (HU), Ireland (IE), Italy (IT), Poland (PL), Portugal (PT) and the United Kingdom (UK).

An alternative measure of labour income, such as previous year cash or near cash income variable, would allow us to construct a measure of monthly earnings for a larger number of countries. However, for most countries there is a non-negligible number of observations with zero months of work and positive cash or near cash income.Furthermore, this variable relates to the year previous to that in which the interview took place, while individual information about industry and occupation is only available for the year of the interview.

As explanatory variables we use workers' experience, two dummies for the highest educational level achieved, nine occupational dummies (ISCO-88), nine dummies for industry affiliation (NACE REV.1.1), a dummy for marital status, a dummy for supervisory position, a dummy for workers born in the country of residence and another identifying public sector workers. There is no direct information in the survey to distinguish between public and private sector workers.

Therefore, following previous studies, such as Giordano et al (2011), we consider as public sector workers those working in one of the following sectors: public administration and defense, compulsory social security, education, human health and social work activities.

Inequality measures computed with raw data are displayed in Table 1. The results confirm previous studies' conclusions about the existence of marked differences among European countries with respect to their degree of wage inequality (OECD, 2011, Dreger et al, 2015). Yet the results differ according to the inequality index. In fact, while Italy presents the lowest inequality levels irrespective of the inequality index used, the highest levels of inequality vary according to the inequality index: Hungary shows the highest value in the Gini index, whereas Greece presents the maximum value for the variance. In addition, considering the percentile log wage gap measures of inequality, Portugal shows the highest values taking as reference the 90-10 log wage differential and the differential in the upper-tail of the wage distribution (90-50), whereas the UK and Ireland present the highest values in the lower tail of the wage distribution. This pattern is in accordance with previous evidence for these countries (Cardoso, 1998; Centeno and Novo, 2014; Lemieux, 2008; OECD, 2011.)

[Table 1 around here]

Table 2 presents the descriptive statistics of the main explanatory variables used in the empirical analysis. The UK and Ireland emerge as the countries with most workers with university education as well as the highest percentage of workers in top occupations, particularly *for Legislators, senior officials and managers* and *Professionals*. Likewise, these countries present high shares of workers with supervisory responsibilities. Lower inequality countries, Austria and

Italy, are among those with a lower percentage of workers with a university degree. But unlike Italy, Austria presents a high percentage of workers with secondary education. Moreover, both countries show a low percentage of individuals working as *Legislators, senior officials and managers* and *Professional*s, but the highest share of *Technicians and associate professionals*. Eastern European countries (Hungary and Poland) present particularly high rates of workers with secondary education and fewer workers performing supervisory tasks. One of the most unequal countries, Portugal, shows the lowest percentages of workers with both secondary education and a university degree and of workers in top occupations. In addition, Portugal also has the lowest percentages of workers with supervisory responsibilities. Spain and Greece seem to be in an intermediate position concerning both education and occupations.

Concerning the industrial structure and the percentage of workers in the public sector, again Ireland and the UK reveal a similar pattern with the highest share of workers in the service sector as well as of those working in the public sector. On the contrary, Portugal, Poland and Hungary have the lowest share of workers in the services sector.

[Table 2 around here]

Regarding experience, Italy, Portugal and Greece show the most experienced labour force, while UK workers are the least experienced among the countries in the sample. Finally, Austria has most immigrants and in Eastern European countries almost all workers are native.

4. Results

The RIF estimations for the various distributional statistics and for the European countries considered are presented in Tables 3 and 4. Considering first the effect of experience variables (*exper* and *exper2*) on wage inequality, we may conclude this is not uniform in the European countries considered, and even within each country the effects quite often change according to the measure of inequality and/or range of the wage distribution. In fact, whereas in Hungary, Italy, Poland, Portugal and Greece the experience variables contribute to increasing inequality for most inequality measures, following the traditional profile of the experience effect on wages, in Spain, Ireland and the UK, for most measures the effects of experience (and its square) on inequality are not significant. In spite of this, there is some evidence of negative effects in the lower tail of the wage distribution (50-10) in Spain and in the UK. Finally, in Austria, the effect of experience on inequality is predominantly negative; however, the effects on the 90-10 and 90-50 wage gaps are not significant.

The t-ratios for the coefficient differences for each variable in relation to Italy[2] , displayed in Table 5, show that experience variables (exper and exper2) are among the variables which present more significant differences. In fact, returns to seniority are typically higher in Hungary, Poland and Portugal and lower in Austria, Ireland and the UK, in relation to Italy. These results suggest that returns to seniority have a more relevant role in determining inequality in poor countries than in richer countries. Founier and Koske (2012) concluded that returns to experience are greater at lower quantiles of the earnings distribution. Therefore, our results may reveal a higher share of low-paid jobs in low-income countries (a composition effect).

[2]Italy presents the lowest levels of inequality in the sample.

The results regarding education are also quite heterogeneous among countries. Secondary education is predominantly associated with lower inequality in the case of Austria, Spain and Poland, while in Ireland, Italy and Portugal the opposite occurs. In the other countries, namely the UK, Greece and Hungary, the effect of secondary education is in general not significant- the test statistics in Table 5 confirm that these differences are statistically significant. Furthermore, the effect of secondary education on inequality along the wage distribution is also not equal among the countries. Indeed, while in Spain and Poland the narrowing effects in inequality appear in the upper-tail of the wage distribution, in Austria this effect is stronger in the lower tail (50-10). Likewise, a similar pattern occurs for the countries where secondary education contributes to increasing wage inequality: in Ireland the positive effect is only significant in the 50-10 log wage gap, whereas in Italy and Portugal it is only significant in the 90-50 log wage gap.

Referring to university education, this variable contributes to increasing wage inequality in the cases of Hungary, Ireland (excluding the 90-10 and 90-50 wage gaps) and Italy, but contributes to narrowing inequality in Austria. For other countries, the link between a university degree and inequality is weaker, as few measures of inequality are positively or negatively associated with this characteristic. In fact, in Spain and Poland, only the Gini index is negatively (and significantly) associated with a university degree; in the UK only the variance is positively related; in Portugal a university degree is positively related with inequality in the 90-10 and 50-10 log wage gaps; in Greece, university education is positively related with the variance and the 90-10 wage gap. Finally, as in the case of secondary education, the tests on the coefficient differences in relation to Italy (Table 5) confirm that, apart from Ireland, these differences are in general significant. Furthermore, in relation to Hungary, a country where a university degree contributes to increased inequality, these tests show that the impact of this characteristic on inequality is higher than in

Italy. Therefore, as for secondary education, the effect of a university degree on inequality is quite heterogeneous among countries.

We do not have direct evidence about the factors explaining these results, but the simple demand and supply framework may provide some rationality. In fact, on the one hand, the generalized rise in the supply of skilled workers over the last decades has contributed to decreasing wage inequality (OECD, 2011). On the other hand, the increase in the demand for skilled workers as a consequence of the skill biased technological change and of trade and financial integration, has contributed to increasing skilled workers' wages and therefore inequality, mainly for those with a university degree (Lemieux, 2008; OECD, 2011).

The supply side explanation seems to be reasonable in the case of secondary education. In fact, the increasing effect of secondary education on inequality seems to be more evident in countries with the lowest percentages of workers with this characteristic, such as Ireland, Italy and Portugal; the exception being Spain. On the other hand, cases of negative effects occur in countries with higher percentages of individuals with secondary education, such as Hungary, Austria and Poland.

In the case of a university degree, it is possible that demand side forces may have a stronger role. Indeed, skill biased technological change and the integration of trade and financial markets explanations favor the wages of highly skilled workers, namely those with a university degree (OECD, 2011; Lemieux, 2008). Nevertheless, most situations of a positive association between university education and inequality occur in countries with the lowest shares of university degrees

(IT, PT and HU) and cases of no significant influence or negative influence occur in countries with high shares of individuals with this characteristic (ES, UK).Therefore, also in the case of university-educated workers, these findings may result from differences in the supply of skilled workers among countries. Ireland, which presents one of the highest percentages of individuals with a university degree, seems to be a special case, as the huge number of foreign technological firms located in this country may have contributed to reinforcing the demand for this kind of worker and, therefore, their wages.

Obviously, it is not possible with this approach to disentangle demand and supply factors or to understand how they influence the results in different countries. However, these heterogeneous results as regards the effects of education on inequality may reflect different demand and supply environments, in addition to existing institutional differences that may also contribute to this heterogeneity.

Previous studies about the effects of education on inequality can also provide useful insights intothis matter. For example, Martins and Pereira (2004) show that returns to education increase along the wage distribution, contributing therefore to within group wage inequality. Budria and Pereira (2011), in addition, found that the effect of education on inequality (within-group wage inequality) is mainly driven by college education. They also found that for a certain number of countries the returns to education decreased from the 1990s to the 2000s, which also reduced the between component of inequality explained by education.Our inequality models measure the contribution of the within and between components together. The results regarding the effect of a university degree on wage inequality are compatible with this previous evidence of a positive contribution of both components (within and between).

OECD (2011), in turn, presents evidence of negative effects of the increase in the work force's level of education on wage dispersion in a sample of 22 OECD countries from 1980 to 2008.Therefore, it is not surprising that by the end of the 2000s the link between education and inequality had weakened and in some countries had become not significant or even negative.

Our results also suggest that investment in education, particularly in secondary education, may be a route to reduce wage inequality. However, the race between the demand and supply of an educated labor force (Tinbergen, 1975) may be more difficult in the case of university educated workers. Hence, a higher effort of investment may be necessary in this level of education. Furthermore, these investments in education may bring indirect benefits as more educated (and more qualified) workers may also decrease inequality by reducing the role of the seniority component on pay and hence on inequality.

[Table 3, around here]

Unlike the effect of experience and education, the results for occupational structure are more homogenous among the countries. The category of *Legislators, senior officials and managers*, at the top of the occupational structure, seems to increase inequality in almost all countries and for the majority of the measures considered. The exceptions to this pattern are the UK and Ireland where the effects are, in general, not significant. Moreover, in general, lower positions on the occupational structure, corresponding to *Professionals* and *Technicians and Associate Professionals*, also reveal a lower influence on wage inequality. In fact, in most cases, the estimated coefficients decrease along the occupational structure, with the highest for *Legislators,*

senior officials and managers. In spite of this, there is some heterogeneity regarding the magnitude of the estimated effect, as several significant differences are found among countries (Table 5).

The positive effect of highly skilled occupations on wage inequality is in accordance with the evidence provided by OECD (2011). However, adding to previous literature, our study also shows that the effects of occupational structure on inequality are not equal along the wage distribution. In Austria, Spain and Italy, the top category of the occupational structure contributes more to wage inequality in the upper tail of the wage distribution. On the contrary, in Greece, Hungary, Poland and Portugal, the effect on inequality is stronger in the lower tail (50-10 wage gap) and higher than the estimated effect for Italy (Table 5).

In OECD (2011) this impact of highly skilled occupations is attributed to the rise in the integration of trade and financial markets and to technological progress which raised the relative demand for skilled workers. Piketty and Saez (2006) put forward other explanations, namely that technological change made managerial skills more general (less enterprise specific), which increased the competition for the best top executives, raising their relative wages. Another explanation is related to pay-setting mechanisms for top executives which result in higher wages for this group. In the same line, Lemieux et al. (2009) find that performance pay jobs increased their share in the US wage distribution, which contributed to raising wage inequality, as inequality is greater under this kind of pay scheme. More educated workers and those in highly paid occupations are more likely to be involved in performance pay schemes. Therefore, this may be another reason for highly skilled (and paid) occupations contributing positively to wage inequality. Finally, offshoring activities are less likely to occur in some high paying professions such as

doctors and lawyers, which may be another factor contributing to increasing inequality in top occupations.

Besides highly skilled occupations, workers with supervisory positions also seem to contribute to a significant increase in wage inequality in most countries. Only in Austria, Ireland and the UK is this result not confirmed, as the coefficient estimates are not significant. Moreover, most of the remaining countries show several positive significant differences in relation to the Italian estimates. Therefore, apart from Poland (90-50wage gap) this effect tends not to be lower than in Italy, in Spain, Greece, Hungary and Portugal.

Our results also reveal that inter-industry wage differences are important in explaining wage inequality in European economies, which agrees with previous evidence (Simon, 2010; Chozelas and Tsakloglou, 2009). But as for occupations, the impact of industry sectors on inequality (Table 4) shows some degree of homogeneity among countries. Indeed, the test statistics in Table 5 confirm that most coefficient differences between each country and Italy are not significant. Unlike previous studies, we also identify which industry sectors contribute to increased inequality in each country and find that the impact on inequality in not the same along the wage distribution. Three main industries show a significant and increasing influence on wage inequality: *Financial intermediation*, *Hotels and Restaurants* and *Transport, Storage and Communication*. The first of these industries presents more uniform results across countries and inequality measures. Indeed, in five of the nine countries analyzed (ES, IT, PL, PT, UK) there are positive and significant effects on inequality in almost all the measures considered, particularly in the upper-tail of the wage distribution (90-50). Moreover, with the exception of Portugal, where most of the coefficient differences are positive and significant, there are only a few significant differences for other

countries. Therefore, apart from countries' compositional differences where the effect of this industry on inequality is significant, financial intermediation seems to contribute more to inequality within countries than to countries' differences in inequality.

The *Hotels and Restaurants* industry has a significant influence on inequality in fewer countries, namely in Spain and Poland, where the effects in the upper tail of the wage distribution are greater than in the lower tail. Unsurprisingly, it is also in these two countries, but especially in Poland, that we find significant coefficient differences in relation to Italy. Finally, the effects of *Transport, storage and communication* industries are more evident in Spain and to a lesser extent in Greece, but very few estimated differences in comparison to Italy are significant (ES: 90-50; GR: Gini and variance). Studies on inter-industry wage differentials report that *Financial intermediation and the Transport, storage and communication* industries are among the highest paying industries in Europe, whereas *Hotels and Restaurants* is one of the lowest paying (Magda et al. 2011; Caju et al. 2011). Therefore, the contribution of industry characteristics to wage inequality is related to inter-industry wage differences.

Concerning the effect of being employed in the public sector on inequality, the results are not significant for the majority of countries. The UK is the only exception, where inequality indexes and public employment are, in general, negatively correlated. These findings are in accordance with Grimshaw (2000), who found that in the case of the UK, the relatively centralized pay arrangements in the public sector compared to those in the private sector contributed to narrowing the increase in overall wage inequality from 1985 to 1995 (public and private sectors). Budria (2010), in turn, in a sample of eight European countries[3], found that the contribution of the between component of education to wage inequality is similar in the public and private sectors,

[3]Finland, France, Germany, Italy, Norway, Portugal, Sweden and the UK.

but the within component is considerably lower in the public sector. Also, Fournier and Koske (2012) found that higher shares of public employment are associated with a narrowing of the earnings distribution. Therefore, negative or non-significant effects of public sector employment on wage inequality agree with previous evidence that refers to the more centralized nature of pay arrangements and more egalitarian concerns in the public sector.

[table 4, around here]

Finally, there is not much indication that the presence of non-native workers contributes to increased inequality. In fact, only in the UK are native workers consistently associated with lower levels of inequality, mainly in the upper part of the wage distribution (90-50). Furthermore, the coefficients differences relatively to Italy are also in general significant For other countries, there is some weak evidence of reducing inequality in Spain (Gini), Austria (90-50) and Italy (90-50) and of increasing it in Hungary (50-10) and Greece (50-10); in Ireland, Poland and Portugal the results are not statistically significant.

Our results are in line with previous empirical evidence for the US and other countries (Blau and Kahn, 2012; Card, 2009) showing that, in general, the effects of immigration on wage inequality are modest or inexistent. Yet our results indicate that the range of wage distribution and the signal of the effects are not uniform across the countries considered.

5. Conclusions

In this study, we present and test a set of regression models for five commonly used inequality measures (the Gini Index, the variance and the following log wage gaps: 90-10, 90-50 and 50-10) using the recentered influence function regression approach. This regression methodology allows

direct testing of the influence of individual and other microeconomic characteristics on inequality measures. To the best of our knowledge, this is the first work presenting regression models for log-wage gaps and testing directly inequality determinants on the set of inequality measures presented.

The analysis is carried out for male workers from nine European countries using data from the European Union Statistics on Income and Living Conditions (EU SILC) for 2008. We focus on the impact of individual characteristics as well as occupation and industry on wage inequality. Our findings show that European countries differ significantly not only in the extent of wage inequality but also in the relative importance of the factors shaping wage inequality. Furthermore, the impact of covariates is not the same across inequality measures, particularly along the wage distribution. Heterogeneity among countries is more evident in relation to education and experience. Conversely, occupation, industry sectors and holding a supervisory position reveal more similar effects. Working in the public sector and being a native worker are characteristics that, in general, are not much relevant to wage inequality.

Regarding the effect of occupations, we conclude that highly paid occupations, particularly *Legislators, senior officials and managers*, seem to significantly increase wage inequality in most countries. Moreover, there are significant country differences regarding the magnitude of the impact of occupations on inequality. Adding to previous literature, we also find that the impact of occupations is not uniform along the wage distribution: there are countries where the influence is higher in the upper tail, while in others the strongest effects are in the lower tail. Similarly, in general, holding a supervisory position contributes to increased wage inequality.

Demand and supply conditions within each country may have a relevant role in explaining earlier results regarding occupational structure and supervisory positions. However, our findings concerning occupational structure are also compatible with more subtle explanations. Indeed, higher relative wages for top executives may result from the increased demand for managerial skills driven by technological progress or from the increase in the share of these workers involved in performance pay schemes and other wage setting mechanisms. Also, some workers in this category may be less likely to be involved in offshoring activities which may also contribute to increasing their relative wages.

Inter-industry wage differentials within each country also contribute to increased wage inequality. We complement previous evidence by concluding that highly paying industries such as "Transport, storage and communication", and especially "Financial intermediation", contribute significantly to increasing inequality as well as "Hotels and restaurants", one of the low paying industries. Moreover, we also find that the impacts on inequality in these sectors are stronger in the upper tail of wage distribution than in the lower tail. However, apart from compositional differences within each country, industry characteristics do not explain inequality differences among countries, as very few significant coefficient differences among countries were found. These results concerning the effect of industrial sectors also suggest that inequality reflects countries' industrial specialization.

Public sector workers' effects on inequality are not entirely uniform across the set of European countries considered, but our results reveal that for most countries this characteristic does not contribute to increased wage inequality. This is in line with previous literature which indicates lower levels of inequality in public sector workers. Also in accordance with previous evidence, we

find that the distinction between native and non-native workers does not add much to explaining wage inequality. The exception is the case of the UK, where the native characteristic is consistently associated with lower levels of wage inequality.

As for the effects of education and experience on inequality, countries show considerable differences. Seniority payments (experience) seem to contribute to increased wage inequality in countries where the work force is less qualified and where wages are lower, such as Hungary, Poland, Italy, Portugal and Greece. In the remaining countries, typically experience does not reveal significant effects on inequality, with the exception of Austria where experience contributes to decreased inequality. Hence, a more qualified work force may be expected to mean lower levels of wage inequality.

In relation to education, both secondary and university education variables have a positive impact on inequality in some countries while in others the opposite occurs. In general, a university degree and especially secondary education are predominantly associated with lower (higher) inequality in countries with the highest (lowest) share of that type of worker. Furthermore, the effects of education along the wage distribution are quite distinct among countries. These results provide new evidence about the impact of education on inequality, as previous studies have typically referred to an increasing contribution of education to wage inequality along the wage distribution (Martins and Pereira, 2004, Budria and Pereira, 2011).

Our findings concerning education and experience may reflect different demand and supply forces operating in each country. In particular, the results related to secondary education seem to be closely linked to the supply of individuals with this characteristic. In the case of a university degree, demand side factors may have a more relevant role in shaping our results. Indeed, skill

biased technological change and increased integration of trade and financial markets have generated a rising demand for skilled workers, which favours the relative wages of this kind of worker, contributing, therefore, to increased wage inequality in some countries. Hence, finding a balanced race between the demand and supply of university educated workers may be more difficult due to a higher relative demand for this kind of worker. However, the effort to promote higher education may be worthwhile as this may also generate indirect effects through reducing the role of seniority in inequality.

Finally, it should be noted that in addition to the different demand and supply conditions among countries, it is also possible that countries' heterogeneity as regard inequality and its determinants is explained by differences in institutional settings, such as collective bargaining and minimum wage regulations, which it was not possible to analyse in this work. Future research should therefore investigate this aspect further.

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TABLES

APPENDIX

Definition of variables

ln hourly wage	The dependent variable is the logarithm of the hourly wage for employees. The measure of wages corresponds to the gross amount received by employees in the main job before tax and social insurance contributions were deducted. Overtime pay, tips and commission as well as supplementary payments (13th and 14th month, holiday payments) are included on a monthly proportional basis
Exper	year of the survey- Year when highest level of education was attained
Exper2	$exper^2/100$
Secondary education	dummy variable; equals one if individual completed upper secondary education (isced3); post-secondary non tertiary education included.
University degree	dummy variable; equals one if individual has a university degree (isced5 or isced6)
Married	dummy variable; equals one if individual is married or living in a consensual union.
Native	dummy variable; equals one if individual has born in the country of residence.
Supervisory	dummy variable; equals one if individual has a Supervisory responsibility.
Public sector	dummy variable; equals one if individual if individual works in one of the following sectors: public administration and defense, compulsory social security, education , human health and social work activities.
occupational dummies	The estimations were carried out using dummies identifying occupations at one digit level of aggregation according to the International Standard Classification of Occupations (ISCO-88).
industry dummies	The estimations were carried out using dummies at one digit level of aggregation identifying the economic sector (NACE REV.1.1).

Table 1: Sample inequality measures

	Gini	Variance	90-10	90-50	50-10
AT	0.098	0.216	1.092	0.597	0.495
ES	0.104	0.197	1.118	0.635	0.484
GR	0.110	0.429	1.052	0.603	0.449
HU	0.201	0.293	1.371	0.794	0.577
IE	0.112	0.313	1.344	0.720	0.625
IT	0.085	0.141	0.891	0.503	0.388
PL	0.174	0.269	1,273	0.693	0.580
PT	0.162	0.319	1.444	0.961	0.483
UK	0.111	0.290	1.322	0.719	0.603

Table 2: Descriptive statistics for selected variables, 2008

	AT	ES	GR	HU	IE	IT	PL	PT	UK
Experience	20.4	20.9	23.2	20.3	19.0	22.3	19.2	25.2	17.1
	(12.3)	(12.7)	(13.2)	(12.0)	(15.0)	(12.6)	(13.0)	(17.2)	(13.2)
Secondary education	0.65	0.25	0.41	0.64	0.37	0.45	0.69	0.16	0.54
	(0.48)	(0.43)	(0.49)	(0.48)	(0.48)	(0.50)	(0.46)	(0.37)	(0.50)
University degree	0.20	0.35	0.28	0.22	0.35	0.17	0.23	0.15	0.34
	(0.40)	(0.47)	(0.45)	(0.41)	(0.48)	(0.38)	(0.42)	(0.35)	(0.47)
Supervisory	0.40	0.23	0.17	0.18	0.28	0.22	0.19	0.16	0.34
	(0.49)	(0.42)	(0.37)	(0.38)	(0.45)	(0.42)	(0.39)	(0.36)	(0.47)
Legislators,	0.06	0.05	0.08	0.05	0.18	0.07	0.06	0.06	0.14
senior officials and managers	(0.24)	(0.22)	(0.27)	(0.23)	(0.38)	(0.26)	(0.23)	(0.23)	(0.35)
	0.10	0.13	0.16	0.13	0.19	0.11	0.15	0.09	0.15
Professionals	(0.30)	(0.34)	(0.37)	(0.33)	(0.39)	(0.31)	(0.36)	(0.29)	(0.36)
Technicians and	0.20	0.11	0.08	0.13	0.05	0.21	0.11	0.09	0.14
associate professionals	(0.40)	(0.32)	(0.27)	(0.34)	(0.22)	(0.40)	(0.32)	(0.29)	(0.34)
Clerks	0.13	0.13	0.11	0.09	0.12	0.12	0.07	0.09	0.14
	(0.34)	(0.34)	(0.31)	(0.28)	(0.33)	(0.32)	(0.26)	(0.30)	(0.35)
Service workers and	0.14	0.16	0.14	0.15	0.19	0.11	0.12	0.16	0.16
shop and market sales workers	(0.35)	(0.37)	(0.35)	(0.36)	(0.39)	(0.32)	(0.32)	(0.36)	(0.37)
Skilled agricultural and	0.04	0.025	0.12	0.03	0.01	0.02	0.12	0.08	0.01
fishery workers	(0.20)	(0.16)	(0.32)	(0.17)	(0.07)	(0.14)	(0.32)	(0.26)	(0.10)
Craft and related trades	0.14	0.16	0.16	0.19	0.12	0.18	0.18	0.21	0.09
workers	(0.34)	(0.36)	(0.37)	(0.39)	(0.32)	(0.38)	(0.38)	(0.41)	(0.29)
Plant and machine	0.06	0.07	0.06	0.13	0.05	0.09	0.11	0.08	0.06
operators and assemblers	(0.24)	(0.26)	(0.24)	(0.34)	(0.32)	(0.29)	(0.31)	(0.28)	(0.25)
	0.22	0.22	0.22	0.22	0.28	0.22	0.19	0.20	0.29
Public sector	(0.42)	(0.41)	(0.41)	(0.41)	(0.45)	(0.41)	(0.39)	(0.40)	(0.45)
Industrial sector	0.29	0.29	0.23	0.35	0.21	0.32	0.38	0.35	0.23
	(0.45)	(0.45)	(0.42)	(0.48)	(0.41)	(0.47)	(0.49)	(0.48)	(0.42)
Services sector	0.71	0.71	0.77	0.65	0.79	0.68	0.62	0.65	0.77
	(0.45)	(0.45)	(0.42)	(0.48)	(0.41)	(0.47)	(0.49)	(0.48)	(0.42)
Native	0.83	0.91	0.89	0.98	0.87	0.90	0.99	0.92	0.90
	(0.38)	(0.29)	(0.31)	(0.14)	(0.34)	(0.30)	(0.06)	(0.27)	(0.31)

Note: standard errors are in parentheses.

Table 3: Recentered influence function regression estimates: selected variables

Poland

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	0.000 (0.000)	-0.001 (0.001)	-0.043*** (0.010)	-0.022* (0.013)	0.006 (0.006)	-0.000 (0.015)	-0.0377 (0.013)	-0.0574*** (0.010)	-0.004 (0.012)	-0.010 (0.033)
Variance	0.005** (0.002)	-0.012*** (0.005)	-0.088** (0.044)	0.067 (0.065)	0.071*** (0.020)	0.184*** (0.065)	0.027 (0.051)	-0.072** (0.035)	0.026 (0.036)	0.036 (0.092)
90-10	0.023*** (0.006)	-0.050*** (0.015)	-0.203*** (0.059)	0.078 (0.113)	0.117** (0.050)	0.520*** (0.124)	0.387*** (0.117)	0.003 (0.085)	0.073 (0.124)	-0.109 (0.459)
90-50	0.017*** (0.006)	-0.039*** (0.013)	-0.129**** (0.044)	0.024 (0.102)	-0.022 (0.048)	0.229* (0.115)	-0.017 (0.108)	-0.312*** (0.077)	0.077 (0.112)	-0.095 (0.440)
50-10	0.007* (0.004)	-0.011 (0.009)	-0.074 (0.049)	0.054 (0.067)	0.139*** (0.027)	0.291*** (0.078)	0.404*** (0.077)	0.315*** (0.076)	-0.004 (0.069)	-0.014 (0.182)
N	5449									

Hungary

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	0.002 (0.001)	-0.004* (0.002)	-0.020** (0.008)	0.061*** (0.015)	0.012 (0.008)	-0.017 (0.02)	-0.068*** (0.018)	-0.065*** (0.013)	-0.012 (0.017)	0.021 (0.019)
Variance	0.012*** (0.003)	-0.027*** (0.007)	-0.022 (0.016)	0.385*** (0.048)	0.088*** (0.031)	0.169** (0.067)	-0.080 (0.056)	-0.070* (0.036)	-0.036 (0.059)	0.018 (0.064)
90-10	0.027*** (0.008)	-0.061*** (0.018)	0.014 (0.053)	1.034*** (0.152)	0.201** (0.092)	0.609*** (0.192)	0.137 (0.215)	0.078 (0.133)	0.108 (0.187)	0.152 (0.140)
90-50	0.011 (0.008)	-0.024 (0.017)	-0.036 (0.054)	0.722*** (0.140)	0.100 (0.089)	0.254 (0.180)	-0.252 (0.174)	-0.305*** (0.110)	0.088 (0.178)	-0.012 (0.151)
50-10	0.016*** (0.005)	-0.037*** (0.011)	0.050 (0.064)	0.311*** (0.089)	0.101*** (0.036)	0.355*** (0.119)	0.390*** (0.116)	0.383*** (0.119)	0.020 (0.089)	0.164* (0.095)
N	3175									

Ireland

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	-0.002** (0.001)	0.005** (0.002)	0.027*** (0.009)	0.023* (0.013)	0.001 (0.008)	0.022 (0.018)	0.017 (0.015)	-0.015 (0.015)	-0.075* (0.041)	-0.000 (0.008)
Variance	-0.001 (0.005)	0.014 (0.011)	0.158*** (0.044)	0.186*** (0.067)	0.052 (0.042)	0.141 (0.110)	0.125 (0.090)	-0.079 (0.089)	-0.393* (0.231)	0.015 (0.048)
90-10	-0.007 (0.014)	0.025 (0.027)	0.263* (0.138)	0.340 (0.214)	0.103 (0.109)	0.259 (0.185)	0.240 (0.201)	-0.179 (0.177)	-0.257 (0.334)	-0.105 (0.142)
90-50	0.010 (0.010)	-0.015 (0.019)	0.089 (0.113)	0.130 (0.175)	-0.004 (0.103)	-0.043 (0.141)	-0.067 (0.156)	-0.546*** (0.121)	0.071 (0.181)	-0.006 (0.105)
50-10	-0.016 (0.012)	0.039 (0.024)	0.175* (0.101)	0.210* (0.118)	0.106 (0.073)	0.302* (0.162)	0.307** (0.148)	0.367*** (0.137)	-0.329 (0.272)	-0.099 (0.099)
N	1412									

Notes: standard errors were estimated by bootstrap (100reps). (***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.

Table 3: Recentered influence function regression estimates: selected variables (cont.)

Portugal

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	0.002***	-0.004***	0.010	0.0179	0.022**	0.077*	0.093***	-0.002	0.028*	-0.007
	(0.001)	(0.001)	(0.009)	(0.020)	(0.010)	(0.043)	(0.026)	(0.011)	(0.017)	(0.010)
Variance	0.017***	-0.028***	0.063	0.151	0.149***	0.515*	0.579***	0.086	0.167**	-0.052
	(0.004)	(0.008)	(0.048)	(0.111)	(0.048)	(0.265)	(0.140)	(0.054)	(0.079)	(0.046)
90-10	0.031***	-0.054**	0.313**	0.534*	0.404***	1.014**	1.057***	0.369*	0.378	-0.204
	(0.013)	(0.023)	(0.136)	(0.309)	(0.141)	(0.415)	(0.390)	(0.175)	(0.243)	(0.181)
90-50	0.026*	-0.046*	0.243*	0.339	0.261*	0.481	0.618	0.010	0.401	-0.160
	(0.014)	(0.024)	(0.130)	(0.302)	(0.137)	(0.430)	(0.384)	(0.160)	(0.261)	(0.177)
50-10	0.005	-0.007	0.070	0.195**	0.143***	0.533***	0.439***	0.359***	-0.023	-0.044
	(0.005)	(0.009)	(0.063)	(0.091)	(0.050)	(0.110)	(0.121)	(0.100)	(0.143)	(0.086)
N	1572									

Spain

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	-0.000	0.001	-0.013***	-0.007*	0.006**	0.058***	0.032***	-0.006	-0.002	-0.013**
	(0.000)	(0.001)	(0.003)	(0.004)	(0.003)	(0.012)	(0.006)	(0.005)	(0.007)	(0.006)
Variance	0.001	-0.000	-0.032	0.005	0.042***	0.293***	0.174***	0.013	0.010	-0.039*
	(0.002)	(0.004)	(0.011)	(0.013)	(0.012)	(0.065)	(0.025)	(0.022)	(0.025)	(0.022)
90-10	0.005	0.004	-0.128***	-0.025	0.113***	0.799***	0.563***	-0.004	0.109	-0.075
	(0.005)	(0.009)	(0.043)	(0.054)	(0.041)	(0.180)	(0.092)	(0.066)	(0.098)	(0.068)
90-50	0.012**	-0.019*	-0.093**	0.006	0.022	0.565***	0.272***	-0.125**	0.085	-0.060
	(0.006)	(0.01)	(0.041)	(0.049)	(0.044)	(0.167)	(0.093)	(0.061)	(0.093)	(0.054)
50-10	-0.007*	0.015**	-0.034	-0.031	0.090***	0.234***	0.291***	0.120**	0.024	-0.015
	(0.004)	(0.007)	(0.037)	(0.039)	(0.030)	(0.072)	(0.057)	(0.061)	(0.061)	(0.058)
N	5440									

Greece

	Exper	Exper2	Secondary Education	University degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	0.001	-0.001	-0.002	0.001	0.024***	0.036*	0.030***	0.008	-0.006	0.005
	(0.001)	(0.001)	(0.005)	(0.006)	(0.007)	(0.021)	(0.010)	(0.011)	(0.011)	(0.006)
Variance	0.007***	-0.009**	0.010	0.049**	0.111***	0.165**	0.154***	0.096*	-0.012	0.018
	(0.002)	(0.004)	(0.015)	(0.025)	(0.027)	(0.083)	(0.045)	(0.049)	(0.037)	(0.020)
90-10	0.019**	-0.025*	-0.005	0.151**	0.267***	0.533**	0.578**	0.165	-0.184	0.079
	(0.009)	(0.017)	(0.063)	(0.063)	(0.057)	(0.100)	(0.255)	(0.151)	(0.164)	(0.058)
90-50	0.018**	-0.032**	-0.022	0.110	0.135	0.292	0.410***	0.011	-0.385**	-0.078
	(0.009)	(0.016)	(0.050)	(0.10)	(0.097)	(0.232)	(0.129)	(0.129)	(0.153)	(0.049)
50-10	0.001	0.007	0.017	0.041	0.131***	0.240**	0.168**	0.154*	0.201**	0.157***
	(0.005)	(0.011)	(0.044)	(0.062)	(0.034)	(0.111)	(0.081)	(0.086)	(0.093)	(0.051)
N	2018									

Notes: standard errors were estimated by bootstrap (100reps). (***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively

Table 3: Recentered influence function regression estimates: selected variables (cont.)

	Exper	Exper2	Secondary Education	University Degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians	Public Sector	Native
Austria										
Gini	-0.003***	0.006 ***	-0.084***	-0.076	-0.005	0.051***	0.041***	0.02**	-0.023	-0.009
	(0.001)	(0.001)	(0.011)	(0.105)	(0.003)	(0.14)	(0.012)	(0.009)	(0.023)	(0.007)
Variance	-0.008***	0.019***	-0.303***	-0.241***	-0.006	0.265***	0.234***	0.113***	-0.095	-0.023
	(0.003)	(0.007)	(0.046)	(0.051)	(0.017)	(0.069)	(0.061)	(0.040)	(0.111)	(0.04)
90-10	-0.014	0.042	-0.800***	-0.588***	0.056	0.809***	0.644***	0.306***	-0.223	-0.133
	(0.013)	(0.026)	(0.147)	(0.172)	(0.0556)	(0.163)	(0.150)	(0.110)	(0.187)	(0.092)
90-50	0.004	0.002	-0.210***	-0.113	0.040	0.423***	0.306***	0.034	-0.116	-0.135***
	(0.006)	(0.013)	(0.042)	(0.077)	(0.040)	(0.117)	(0.116)	(0.059)	(0.10)	(0.048)
50-10	-0.019*	0.040*	-0.589***	-0.475***	0.017	0.386***	0.338***	0.272***	-0.107	-0.107
	(0.011)	(0.021)	(0.147)	(0.165)	(0.044)	(0.131)	(0.110)	(0.099)	(0.161)	(0.077)
N	2429									
Italy										
	Exper	Exper2	Secondary Education	University degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians	Public Sector	Native
Gini	0.000	0.000	0.004	0.033***	0.006**	0.062***	0.022***	-0.016	-0.005	-0.002
	(0.000)	(0.000)	(0.003)	(0.005)	(0.003)	(0.013)	(0.008)	(0.005)	(0.006)	(0.004)
Variance	0.002**	-0.004*	0.021***	0.143***	0.035***	0.272	0.108	-0.042***	0.009	-0.002
	(0.001)	(0.002)	(0.007)	(0.015)	(0.007)	(0.055)	(0.028)	(0.015)	(0.020)	(0.010)
90-10	0.008**	-0.015*	0.074**	0.434***	0.113***	0.664***	0.301***	-0.131**	-0.059	-0.045
	(0.004)	(0.009)	(0.030)	(0.075)	(0.034)	(0.159)	(0.100)	(0.065)	(0.080)	(0.053)
90-50	0.014***	-0.026***	0.070***	0.350***	0.107***	0.666***	0.307***	-0.096**	-0.067	-0.080**
	(0.003)	(0.006)	(0.023)	(0.068)	(0.033)	(0.125)	(0.078)	(0.038)	(0.063)	(0.034)
50-10	-0.007**	0.011	0.004	0.084**	0.006	-0.001	-0.006	-0.036	0.008	0.036
	(0.003)	(0.007)	(0.026)	(0.035)	(0.019)	(0.081)	(0.071)	(0.062)	(0.052)	(0.042)
N	7085									
United Kingdom										
	Exper	Exper2	Secondary Education	University degree	Supervisory	Legislators senior officials and managers	Professionals	Technicians and associate professionals	Public Sector	Native
Gini	-0.002**	0.003**	0.004	0.012	-0.006	-0.014*	-0.035***	-0.030***	-0.026***	-0.017**
	(0.001)	(0.001)	(0.012)	(0.13)	(0.004)	(0.008)	(0.008)	(0.009)	(0.009)	(0.007)
Variance	-0.005*	0.009	0.051	0.124**	-0.012	0.041	-0.084*	-0.042	-0.166***	-0.091**
	(0.003)	(0.007)	(0.048)	(0.051)	(0.019)	(0.042)	(0.043)	(0.062)	(0.044)	(0.041)
90-10	-0.005	0.000	-0.068	0.160	-0.022	0.044	-0.310**	-0.328**	-0.375***	-0.347***
	(0.008)	(0.019)	(0.237)	(0.243)	(0.062)	(0.147)	(0.131)	(0.147)	(0.142)	(0.112)
90-50	0.004	-0.019	-0.031	0.076	-0.019	-0.065	-0.348***	-0.250***	-0.261***	-0.265***
	(0.007)	(0.016)	(0.119)	(0.141)	(0.058)	(0.096)	(0.086)	(0.090)	(0.104)	(0.097)
50-10	-0.010*	0.019	-0.037	0.084	-0.003	0.109	0.038	-0.077	-0.114	-0.082
	(0.006)	(0.013)	(0.253)	(0.259)	(0.038)	(0.115)	(0.116)	(0.129)	(0.132)	(0.070)
N	5449									

Notes: standard errors were estimated by bootstrap (100reps). (***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively

Table 4: Recentered influence function regression estimates: Industry effects

		Mining and quarrying, Manufacturing, Electricity, gas and water supply	Construction	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	Hotels and Restaurants	Transport, storage and communication	Financial intermediation	Real estate, renting and business activities
Poland	Gini	-0.004 (0.010)	0.010 (0.108)	0.012 (0.011)	0.050 (0.020)**	0.008 (0.011)	0.092 (0.017)***	0.027 (0.012)**
	Variance	0.029 (0.035)	0.041 (0.037)	0.049 (0.039)	0.141 (0.070)**	0.060 (0.039)	0.51 (0.057)***	0.114 (0.042)***
	90-10	0.122 (0.108)	0.071 (0.109)	0.127 (0.122)	0.656 (0.219)***	0.248 (0.114)**	0.704 (0.246)***	0.038 (0.128)
	90-50	0.087 (0.10)	0.082 (0.10)	0.157 (0.106)	0.483 (0.164)***	0.175 (0.102)*	0.532 (0.228)**	0.081 (0.116)
	50-10	0.035 (0.065)	-0.011 (0.068)	-0.030 (0.074)	0.174 (0.154)	0.073 (0.064)	0.171 (0.087)**	-0.043 (0.086)
Hungary	Gini	0.009 (0.014)	0.026 (0.015)*	0.024 (0.015)	0.016 (0.021)	0.008 (0.015)	0.047 (0.025)*	0.021 (0.016)
	Variance	0.049 (0.047)	0.038 (0.051)	0.056 (0.050)	0.068 (0.068)	0.061 (0.050)	0.262 (0.083)***	0.069 (0.053)
	90-10	0.158 (0.160)	0.090 (0.167)	0.203 (0.176)	0.194 (0.205)	0.160 (0.154)	0.544 (0.374)	0.154 (0.198)
	90-50	0.093 (0.164)	0.184 (0.165)	0.193 (0.176)	0.192 (0.216)	0.047 (0.165)	0.381 (0.388)	0.120 (0.199)
		0.065 (0.088)	-0.093 (0.096)	0.010 (0.094)	0.003 (0.133)	0.113 (0.084)	0.162 (0.106)	0.033 (0.104)
Portugal	Gini	0.028 (0.018)	0.029 (0.018)	0.011 (0.018)	0.038 (0.022)*	0.022 (0.020)	0.125 (0.023)***	-0.008 (0.021)
	Variance	0.126 (0.087)	0.130 (0.089)	0.053 (0.089)	0.092 (0.106)	0.133 (0.096)	0.599 (0.114)***	0.001 (0.103)
	90-10	0.175 (0.226)	0.054 (0.210)	-0.009 (0.221)	0.207 (0.254)	0.336 (0.267)	1.384 (0.437)***	0.057 (0.365)
	90-50	0.356 (0.242)	0.309 (0.242)	0.168 (0.241)	0.346 (0.272)	0.249 (0.295)	1.193 (0.466)***	0.174 (0.364)
	50-10	-0.181 (0.150)	-0.255 (0.152)	-0.177 (0.152)	-0.139 (0.182)	0.086 (0.158)	0.191 (0.160)	-0.117 (0.152)
Spain	Gini	-0.005 (0.005)	-0.003 (0.005)	0.001 (0.006)	0.025 (0.007)***	0.010 (0.006)*	0.036 (0.007)***	-0.008 (0.006)
	Variance	-0.007 (0.020)	-0.008 (0.021)	0.004 (0.022)	0.077 (0.028)***	0.060 (0.024)**	0.185 (0.028)***	-0.026 (0.024)
	90-10	-0.007 (0.094)	0.050 (0.098)	0.029 (0.089)	0.336 (0.114)***	0.221 (0.097)**	0.648 (0.154)***	-0.074 (0.109)
	90-50	0.078 (0.089)	0.199 (0.086)**	0.245 (0.089)***	0.397 (0.091)***	0.210 (0.087)***	0.578 (0.143)***	0.082 (0.107)
	50-10	-0.085 (0.061)	-0.149 (0.072)**	-0.215 (0.063)***	-0.061 (0.102)	0.010 (0.067)	0.070 (0.077)	-0.156 (0.074)**
Greece	Gini	0.006 (0.012)	0.002 (0.011)	0.016 (0.011)	0.015 (0.014)	0.028 (0.013)**	0.008 (0.014)	0.001 (0.013)
	Variance	0.031 (0.038)	0.007 (0.040)	0.051 (0.042)	0.035 (0.045)	0.138 (0.062)**	0.028 (0.047)	-0.008 (0.046)
	90-10	0.018 (0.143)	-0.087 (0.150)	0.032 (0.149)	-0.087 (0.168)	0.208 (0.182)	0.260 (0.246)	0.080 (0.217)
	90-50	-0.0290 (0.131)	-0.113 (0.134)	0.049 (0.137)	-0.045 (0.144)	0.021 (0.164)	0.044 (0.243)	0.077 (0.199)
	50-10	0.047 (0.086)	0.025 (0.010)	-0.018 (0.097)	-0.043 (0.123)	0.187 (0.101)*	0.216 (0.097)**	0.003 (0.116)

Notes: standard errors were estimated by bootstrap (100reps). (***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.

Table 4: Recentered influence function regression estimates: Industry effects (cont.)

		Mining and quarrying, Manufacturing, Electricity, gas and water supply	Construction	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	Hotels and Restaurants	Transport, storage and communication	Financial intermediation	Real estate, renting and business activities
Ireland	Gini	-0.066 (0.015)***	-0.073 (0.016)***	-0.071 (0.015)***	-0.071 (0.019)***	-0.077 (0.017)***	-0.039 (0.017)**	-0.067 (0.016)***
	Variance	-0.360 (0.092)***	-0.409 (0.095)***	-0.440 (0.091)***	-0.465 (0.115)***	-0.455 (0.103)***	-0.199 (0.106)*	-0.417 (0.096)***
	90-10	-0.413 (0.329)	-0.420 (0.321)	-0.396 (0.315)	-0.213 (0.428)	-0.417 (0.354)	-0.097 (0.411)	-0.391 (0.379)
	90-50	-0.092 (0.188)	-0.144 (0.175)	0.133 (0.182)	0.261 (0.177)	-0.236 (0.186)	0.353 (0.265)	0.151 (0.177)
	50-10	-0.322 (0.276)	-0.276 (0.264)	-0.529 (0.277)*	-0.475 (0.365)	-0.181 (0.293)	-0.450 (0.296)	-0.542 (0.326)
Austria	Gini	-0.029 (0.010)***	-0.036 (0.011)***	-0.013 (0.011)	0.017 (0.014)	-0.021 (0.012)**	-0.013 (0.013)	-0.027 (0.011)**
	Variance	-0.122 (0.049)**	-0.150 (0.053)***	-0.066 (0.051)	0.016 (0.068	-0.072 (0.056)	-0.053 (0.065)	-0.124 (0.055)**
	90-10	-0.212 (0.182)	-0.239 (0.202)	-0.068 (0.189)	0.488 (263)*	-0.225 (0.190)	0.178 (0.225)	-0.089 (0.212)
	90-50	-0.116 (0.095)	-0.087 (0.104)	-0.005 (0.104)	0.090 (0.108)	-0.101 (0.108)	0.218 (0.173)	-0.034 (0.110)
	50-10	-0.095 (0.168)	-0.152 (0.196)	-0.063 (0.169)	0.397 (0.239)*	-0.124 (0.169)	-0.040 (0.183)	-0.056 (0.181)
Italy	Gini	-0.007 (0.004)*	0.004 (0.004)	0.008 (0.004)*	0.015 (0.006)**	-0.003 (0.005)	0.029 (0.006)***	0.000 (0.005)
	Variance	-0.012 (0.014)	0.015 (0.016)	0.025 (0.015)*	0.038 (0.022)*	0.000 (0.016)	0.112 (0.020)***	0.000 (0.018)
	90-10	-0.033 (0.076)	0.093 (0.084)	0.076 (0.074)	0.138 (0.116)	0.032 (0.073)	0.363 (0.139)***	-0.060 (0.089)
	90-50	0.003 (0.055)	0.051 (0.058)	0.068 (0.054)	0.034 (0.069)	-0.047 (0.060)	0.219 (0.128)*	-0.033 (0.071)
	50-10	-0.035 (0.053)	0.041 (0.066)	0.008 (0.057)	0.104 (0.089)	0.079 (0.051)	0.144 (0.054)***	-0.027 (0.059)
UK	Gini	-0.015 (0.010)	-0.008 (0.011)	0.008 (0.010)	0.046 (0.016)***	-0.016 (0.011)	0.036 (0.011)***	0.006 (0.010)
	Variance	-0.026 (0.056)	0.027 (0.061)	0.070 (0.060)	0.227 (0.094)**	-0.014 (0.062)	0.289 (0.067)***	0.093 (0.058)
	90-10	-0.230 (0.141)	-0.228 (0.145)	-0.080 (0.157)	0.372 (0.305)	-0.221 (0.169)	0.599 (0.235)***	0.101 (0.170)
	90-50	-0.141 (0.104)	-0.122 (0.101)	-0.002 (0.103)	0.095 (0.200)	0.009 (0.125)	0.604 (0.187)***	0.021 (0.127)
	50-10	-0.089 (0.118)	-0.106 (0.129)	-0.078 (0.136)	0.277 (0.233)	-0.231 (0.126)*	-0.005 (0.149)	0.080 (0.134)

Notes: standard errors were estimated by bootstrap (100reps). (***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.

Table 5: Tests on coefficient differences in relation to Italy (t ratios)

	AT					ES					GR				
	90-10	**90-50**	**50-10**	**Gini**	**Var.**	**90-10**	**90-50**	**50-10**	**Gini**	**Var.**	**90-10**	**90-50**	**50-10**	**Gini**	**Var.**
Exper	-1,70*	-1,50	-1,10	-4,03***	-3,22***	-0,46	-0,44	-0,08	-0,68	-0,45	1,14	0,41	1,23	1,21	1,86*
Exper2	2,05**	1,89*	1,30	3,86***	3,37***	0,89	0,60	0,45	1,02	0,91	-0,52	-0,34	-0,34	-0,80	-1,07
Secondary education	-5,83***	-5,82***	-3,99***	-8,11***	-6,97***	-3,85***	-3,46	-0,87	-4,01***	-4,15***	-1,13	-1,66*	0,24	-1,11	-0,67
University degree	-5,44***	-4,51***	-3,31***	-9,31***	-7,21***	-4,97***	-4,11	-2,20**	-6,07***	-6,79***	-2,16**	-1,97**	-0,60	-3,88***	-3,23***
Married	-1,57	-1,52	-0,64	-0,89	-1,28	0,01	-1,13	1,46	0,06	0,39	0,09	-2,21**	2,92***	-2,20**	-1,62
Supervisory	-0,87	-1,29	0,22	-2,71***	-2,22***	-0,01	-1,54	2,38**	-0,19	0,49	1,46	0,28	3,24***	2,43**	2,75***
Legislators, senior oficials and managers	0,64	-1,42	2,52**	-0,52	-0,08	0,56	-0,49	2,17**	-0,24	0,24	-0,44	-1,41	1,75*	-1,07	-1,08
Professionals	1,90*	-0,01	2,62	1,31	1,88***	1,92*	-0,29	3,24***	1,03	1,74*	1,53	0,68	1,61	0,62	0,87
Technicians	3,43***	1,84*	2,63***	3,41***	3,62***	1,37	-0,40	1,79*	1,41	2,09**	1,94*	0,79	1,79*	1,89*	2,69***
Mining and quarrying, Manufacturing, Electricity, gas and water supply	-0,91	-1,09	-0,34	-0,94	-0,97	0,21	0,71	-0,61	0,19	0,15	0,31	-0,23	0,82	1,01	1,00
Construction	-1,51	-1,16	-0,94	-1,73*	-1,41	-0,33	1,42	-1,95*	-0,67	-0,74	-1,05	-1,12	-0,13	-0,13	-0,17
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	-0,71	-0,62	-0,40	-0,89	-0,81	-0,40	1,70*	-2,61***	-0,72	-0,68	-0,27	-0,13	-0,23	0,62	0,55
Hotels and Restaurants	1,22	0,44	1,15	0,07	-0,18	1,21	3,18***	-1,22	0,69	0,86	-1,10	-0,49	-0,96	-0,01	-0,04
Transport, storage and communication	-1,26	-0,43	-1,16	-0,78	-0,62	1,55	2,44**	-0,82	1,20	1,63	0,90	0,39	0,96	2,07**	2,12**
Financial intermediation	-0,70	-0,01	-0,97	-1,76*	-1,40	1,37	1,87*	-0,79	0,49	1,08	-0,37	-0,64	0,65	-1,31	-1,50
Real estate, renting and business activities	-0,13	-0,01	-0,15	-1,08	-1,09	-0,10	0,90	-1,36	-0,69	-0,68	0,60	0,52	0,23	0,06	-0,16
Public sector	-0,80	-0,41	-0,68	-0,77	-0,93	1,34	1,35	0,21	0,36	0,02	-0,68	-1,92*	1,80*	-0,12	-0,52
Native	-0,83	-0,94	-0,38	-0,94	-0,51	-0,35	0,31	-0,71	-1,55	-1,52	1,57	0,04	1,82*	1,01	0,90

(***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.

Table 5 (cont.): Tests on coefficient differences in relation to Italy (t ratios)

	HU					IE					PL				
	90-10	**90-50**	**50-10**	**Gini**	**Var.**	**90-10**	**90-50**	**50-10**	**Gini**	**Var.**	**90-10**	**90-50**	**50-10**	**Gini**	**Var.**
Exper	2,02**	-0,43	4,11***	1,53	3,03***	-0,97	-0,46	-0,82	-1,95*	-0,65	2,05**	0,35	2,68**	0,25	1,30
Exper2	-2,28**	0,11	-3,83***	-1,65*	-3,32***	1,38	0,54	1,14	2,50**	1,58	-2,05**	-0,93	-1,99**	-0,50	-1,57
Secondary education	-0,98	-1,79*	0,66	-2,84***	-2,38**	1,34	0,17	1,64	2,39**	3,09***	-4,16***	-3,97***	-1,43	-4,56***	-2,40**
University degree	3,54***	2,39**	2,38**	1,72*	-3,27***	-0,41	-1,17	1,02	-0,77	0,62	-2,62**	-2,66***	-0,39	-3,93***	-1,13
Married	0,17	-2,24**	3,08***	-0,62	0,18	-1,27	-2,16**	1,02	-2,07**	-1,91*	1,15	-1,06	3,25***	-0,94	0,67
Supervisory	0,89	-0,08	2,35**	0,67	1,64	-0,09	-1,02	1,32	-0,66	0,41	0,07	-2,22**	4,07***	-0,14	1,74
Legislators, senior oficials and managers	-0,22	-1,88*	2,48**	-3,28***	-1,21	-1,66*	-3,76***	1,68*	-1,84*	-1,07	-0,72	-2,57**	2,60***	-3,13***	-1,04
Professionals	-0,69	-2,93***	2,90***	-4,61***	-3,01***	-0,27	-2,14**	1,90*	-0,29	0,17	0,56	-2,44**	3,91***	-4,09***	-1,41
Technicians	1,42	-1,79*	3,11***	-3,48***	-0,72	-0,25	-3,54***	2,67***	0,06	-0,41	1,25	-2,53**	3,59***	-3,65***	-0,79
Mining and quarrying, Manufacturing, Electricity, gas and water supply	1,07	0,52	0,98	0,89	1,02	-1,13	-0,48	-1,02	-1,42	-1,40	1,17	0,74	0,84	0,22	1,09
Construction	-0,01	0,75	-1,16	1,20	0,36	-1,54	-1,06	-1,17	-2,00**	-1,84*	-0,15	0,27	-0,56	0,45	0,64
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	0,66	0,68	0,02	0,76	0,44	-1,46	0,34	-1,90*	-2,08**	-2,10*	0,36	0,75	-0,41	0,30	0,56
Hotels and Restaurants	0,24	0,70	-0,63	0,03	0,39	-0,79	1,20	-1,54	-2,06**	-2,27**	2,09**	2,52**	0,39	1,50	1,82*
Transport, storage and communication	0,75	0,54	0,34	0,54	0,93	-1,24	-0,96	-0,88	-1,86*	-1,97**	1,59	1,87*	-0,08	0,78	1,64
Financial intermediation	0,45	0,40	0,15	0,47	0,80	-1,06	0,45	-1,97**	-1,73*	-1,44	1,21	1,20	0,27	2,05**	2,31**
Real estate, renting and business activities	0,98	0,73	0,51	1,03	0,92	-0,85	0,97	-1,55	-1,74*	-1,89*	0,63	0,84	-0,15	1,48	1,68*
Public sector	0,82	0,82	0,12	-0,38	-0,72	-0,58	0,72	-1,22	-1,72*	-1,74*	0,90	1,12	-0,14	0,08	0,42
Native	1,31	0,44	1,23	1,13	0,32	-0,40	0,67	-1,25	0,13	0,36	-0,14	-0,03	-0,27	-0,25	0,41

(***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.

Table 5 (cont.): Tests on coefficient differences in relation to Italy (t ratios)

	PT					UK				
	90-10	**90-50**	**50-10**	**Gini**	**Var.**	**90-10**	**90-50**	**50-10**	**Gini**	**Var.**
Exper	1,68*	0,86	1,98**	2,94***	3,11***	-1,47	-1,31	-0,52	-2,74***	-2,36**
Exper2	-1,59	-0,84	-1,68*	-2,59**	-2,94***	0,72	0,40	0,54	2,31**	1,78*
Secondary education	1,71*	1,31	0,95	0,80	0,88	-0,60	-0,83	-0,16	-0,02	0,62
University degree	0,32	-0,04	1,14	-0,74	0,07	-1,08	-1,75*	0,00	-1,53	-0,36
Married	0,68	0,27	0,76	-0,97	-0,25	0,68	0,48	0,37	-0,30	-0,27
Supervisory	2,01**	1,09	2,55**	1,53	2,37**	-1,92*	-1,89*	-0,21	-2,60***	-2,27**
Legislators, senior oficials and managers	0,79	-0,41	3,91***	0,33	0,90	-2,87***	-4,64***	0,78	-4,94***	-3,37***
Professionals	1,88*	0,79	3,16***	2,59**	3,29***	-3,71***	-5,64***	0,32	-5,12***	-3,73***
Technicians	2,68***	0,65	3,37***	1,04	2,27**	-1,22	-1,58	-0,29	-1,26	0,01
Mining and quarrying, Manufacturing, Electricity, gas and water supply	0,87	1,43	-0,92	1,85*	1,67*	-1,23	-1,22	-0,42	-0,77	-0,31
Construction	-0,17	1,04	-1,79*	1,20	1,25	-1,91*	-1,48	-1,02	-0,80	0,18
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	-0,36	0,40	-1,13	0,12	0,32	-0,90	-0,60	-0,58	-0,04	0,73
Hotels and Restaurants	0,25	1,11	-1,20	0,74	0,57	0,72	0,29	0,69	1,22	1,65*
Transport, storage and communication	1,10	0,98	0,05	1,13	1,33	-1,38	0,41	-2,28**	-1,24	-0,28
Financial intermediation	2,23**	2,02**	0,28	3,49***	3,49***	0,86	1,70*	-0,95	0,44	2,06**
Real estate, renting and business activities	0,31	0,56	-0,55	-0,30	0,00	0,84	0,37	0,73	0,54	1,75*
Public Sector	1,71*	1,74*	-0,20	1,87*	1,94*	-1,94*	-1,59	-0,85	-1,92*	-1,67*
Native	-0,84	-0,44	-0,83	-0,47	-1,07	-2,44**	-1,78*	-1,44	-1,88*	-2,08**

(***), (**) and (*) indicates that the estimated coefficients are significant at 1%, 5% and 10% level, respectively.