Income inequality in European Regions: Recent trends and determinants

David Castells-Quintana, Raul Ramos and Vicente Royuela*

dcastells@ub.edu, rramos@ub.edu, vroyuela@ub.edu

AQR-IREA Research Group. University of Barcelona

Av. Diagonal, 690. 08034 Barcelona, SPAIN.

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* Corresponding author: Vicente Royuela, AQR-IREA, Dpt. Econometrics, University of Barcelona. Av. Diagonal 690, 08034 Barcelona (Spain). E-mail: vroyuela@ub.edu Phone +34+934035732 Fax +34+934021821.

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Abstract: Income inequality is both at the political and academic agenda. Because of the Great Recession, income inequality has experienced an increase in many parts of the world in general and in many European regions in particular. In addition, several academics have signalled inequality as a source of such crisis. Nevertheless, few attempts have been made for conducting the analysis at the regional level. In this work we analyse the main factors behind current trends in inequality in Europe over the last decade. We develop our analysis at the regional level, which adds a new dimension to the existing literature. Our results point to a large diversity in inequality patterns. Inequality is on average lower in more developed regions, but recent increases in inequality seem associated with economic growth, technological innovation and specialisation in tradable services. Inequality is also higher in regions with higher density and higher unemployment.

Keywords: Regional income inequality, European regions, Great Recession

JEL codes: D63, O18, R11, R12

1. Introduction

Several academics have recently emphasized the role of inequality on economic growth (Persson and Tabellini 1994; Clarke, 1995; Barro, 2000; Forbes, 2000; Galor, 2000; Chen, 2003; Knowles, 2005; Castells-Quintana and Royuela, 2014a; Atems and Jones, 2014; Halter et al., 2014, to mention a few cross-country studies). In particular, some emphasis has been posed on the evolution of inequality as a natural consequence of the Great Recession but also as one of its major causes (Krugman, 2008; Stiglitz, 2009; Rajan, 2010; Fitoussi and Saraceno, 2010; Acemoglu, 2011). In addition, policy makers are also concerned with the evolution of inequality and its negative effects on development. Institutions such as the European Union, the OECD and the United Nations have expressed an increasing concern for inequality: the EU2020 Strategy aims at achieving an inclusive economic growth, benefitting the largest possible number of people; the OECD is involved in the Inclusive Growth Initiative; and since 2011 the Human Development Report of the United Nations considers the *inequality-adjusted* Human Development Index.

But, should we be really worried for the existence of income inequality? Beyond the fair concerns associated with equity and justice, inequality matters as far as it can be seen as a factor potentially affecting economic growth. If we see inequality as a result of varied personal effort and performance, it can be seen as a growth-related factor: the higher risks people take or simply the more incentives for hard work they have, the higher inequality and economic growth one can expect. On the contrary, high income inequality can also be associated with less education opportunities, imperfect credit markets preventing capital accumulation, higher taxes discouraging risk taking, and even heterogeneous effects of aggregate shocks (such as a deep crisis like the current one) on income distribution, all of which can harm growth.[1] It is, therefore, important to understand the determinants of the recent evolution of inequality, before and after the Great Recession. Furthermore, it is important to understand particular dynamics of specific locations. In this regard, the regional dimension not only has additional methodological advantages for empirical analysis (discussed below) but it also allows for more specific policy analysis (in the case of Europe of particular interest given policies explicitly aimed at fostering equitable growth between and within regions).

[1] See Ehrhart (2009), Galor (2009), Neves and Silva (2014) and Castells-Quintana and Royuela (2014a) for comprehensive literature reviews on the transmission channels between inequality and economic growth.

In this paper we develop an empirical analysis at the regional level to find the main trends and factors behind the evolution of income inequality in Europe over the last decades. In particular, we aim at exploring potential factors that may help us to explain the recent increases in inequality that many European regions have experienced. In relation to the existing literature the paper is linked to previous works studying the determinants of inequality (Fields, 1979, for Least Developed Countries; Milanovic, 1994; Li et al., 1998; Gustafsson and Johansson, 1999; Barro, 2000; Vanhoudt, 2000 and Roine et al., 2009, for world samples, Odedokun and Round, 2004, for Africa, and recently Castells-Quintana and Larrú, 2014, for Latin America). These studies have relied on international comparisons using data at the national level. The paper also relates to previous studies analysing inequality trends at the regional level, most of them focusing on specific countries (recent examples are Dickey, 2014, for the United Kingdom, Lin et al., 2014, for Taiwan, and Paredes et al., 2014, for Chile). Given the lack of comparable and reliable data few studies have conducted regional analysis for several countries: Galbraith and Garcilazo (2005), using payroll data, and Longford et al. (2012), using income data, have analysed inequality within European regions. Ezcurra (2007), Rodríguez-Pose and Tselios (2008), Perugini and Martino (2008) and Royuela et al. (2014), have focused on the relationship between income inequality and economic development at regional level (the first three papers for European Regions and Royuela et al. for OECD regions). Of these last papers only Perugini and Martino's analyses the determinants on inequality within regions, relying on repeated cross-sections and few observations prior to the Great Recession.

Our paper contributes to the literature by providing an analysis of the determinants of inequality at the regional level, considering further determinants (as those related to sectoral composition of the economy), extending the number of observations (NUTS 1 European regions) and using panel data. We also pay special attention to pre- and post-Great Recession dynamics.

Regarding the evolution of inequality, our work highlights wide heterogeneity among European regions (wider at the regional than at the country level). In general patters, while between 1996 and 2007 inequality tended to decrease, between 2007 and 2010 it increased in 29 out of 39 regions analysed. Regarding the determinants, our econometric estimates report that inequality is on average lower in more developed regions. However, our estimates also suggest that economic growth driven by specialisation in tradable services and technological innovations, as well as institutional factors, may be behind current increases in income inequality in European regions.

The remainder of the paper is organised as follows. In section 2 we analyse the evolution of income inequality in European regions since the mid-nineties. Next, in section 3 we analyse the potential determinants by considering the role of different factors in the evolution of income inequality in European regions in a regression framework. Last, we conclude with the main findings and policy implications.

2. Inequality in European regions, data and trends: 1996-2011

This section describes the main trends in inequality indices in European regions in the last 15 years. This period can be clearly split in two parts: before and after the start of the Great Recession, characterised by the joint impact of the global downturn, the bursting of housing bubble and major fiscal adjustments in several EU countries.

From a database point of view, we also consider two differentiated periods: the European Community Household Panel (ECHP) survey contains data on individuals and households for 15 European countries, with eight waves available (1994–2001). Starting in 2004 the European Union Survey on Income and Living Conditions (EU-SILC) provides information of a wider sample of European countries (28 EU member states plus Iceland, Norway and Switzerland).[2] The information is homogeneous across countries, with similar questionnaires and procedures to collect the information, which were coordinated by Eurostat. Both ECHP and EU-SILC provide detailed information on annual income.

We use inequality measures based on the concept of "equivalised" household disposable income, which includes income from wages and salaries, self-employment incomes, realised property incomes, cash transfers from the general government less taxes and social security contributions paid by the households (Eurostat). Thus, we consider total income of a household after tax and other deductions and available for spending or saving, divided by the number of household members converted into equalised adults.[3] Using personal cross-sectional weights, we have calculated four different measures of inequality: the *Gini coefficient*, the ratio between the ninth and the first decile (*P9010*), the ratio between the

[2] This work considers the seven available waves, from 2004 to 2012. The 2004 data wave is only available for few countries and the 2012 wave does not provide information for Belgium and Ireland. Data for 2005 and 2006 is also incomplete for some countries. Appendix 1 lists all regions considered (in the ECHP and in the EU-SILC samples).

[3] Household members are made equivalent using an equivalence scale, which gives a weight to all members of the household: 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; and 0.3 to each child under the age of 14. Then these are added up to arrive at the equivalised household size.

fifth and the first decile (*P5010*) and the ratio between the ninth and the fifth decile (*P9050*). For data availability and comparability reasons across ECHP and EU-SILC, we have computed the inequality indices at the NUTS-1 regional level.[4]

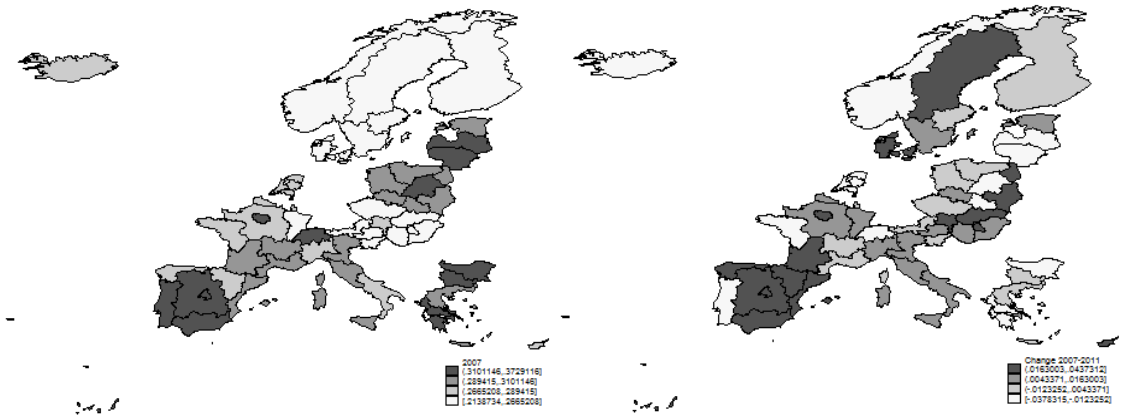
According to the trends, the first period of analysis (1996-2007) was characterised by reductions in within regional inequality. Among the regions where inequality displayed the largest reduction during this period we find some Greek (EL1, EL4) and some Spanish regions (ES1, ES7). By contrast, between 2007 and 2010 inequality increased in 29 out of 39 regions. Figure 1 present two maps. The first one shows Gini coefficients at the beginning of the crisis (2007) for our considered NUTS1 European regions. The second map shows the increase in the Gini coefficient between 2007 and 2011. In terms of levels in 2007, relevant heterogeneity within countries can be appreciated, but the general picture reflects higher levels of inequality in Spanish and Greek regions (despite previous reductions in some of them) as well as in Eastern Europe regions. Some of the regions host of main capitals (Berlin, Paris and Madrid) also tend to display relatively high levels of inequality. By contrast, Nordic regions tend to display low levels if inequality. Looking at the evolution during the crisis (2007-2011), it seems that it is precisely in those regions where inequality levels where already high where inequality increased the most. But the impact of the Great Recession seems to have been diverse. In particular, looking at those EU countries more affected by the sovereign debt crisis, while inequality substantially increased in all Spanish regions, it experienced a slight increase in Greek regions, while decreased in Portuguese and Irish regions. Regarding main capital regions, in contrast to Île de France (Paris) and Madrid, inequality decreased significantly in Berlin.

In Figure 2 we analyse the evolution of inequality not only looking at the Gini coefficient but also at the other measures considered (*P9010*, *P5010*, *P9050*). The figure reflects the evolution of the average level, as well as the dispersion, of regional inequality for our sample of European regions. Two main facts can be appreciated from this figure. In first place a reversion after 2007 in the tendency towards a lower average level of inequality within regions. In second place a reversion also in the process of convergence between regions in terms of inequality. Interestingly, the raise in regional differences between 2007 and 2011 (the period associated with the Great Recession) seems associated to an increase in the left side of the distribution (between lower income levels: *P5010*) but not so much in the right side of the distribution (between higher income levels: *P9050*).

[4] Income inequality measures for all the considered regions and periods can be found in the Electronic Supplementary Material

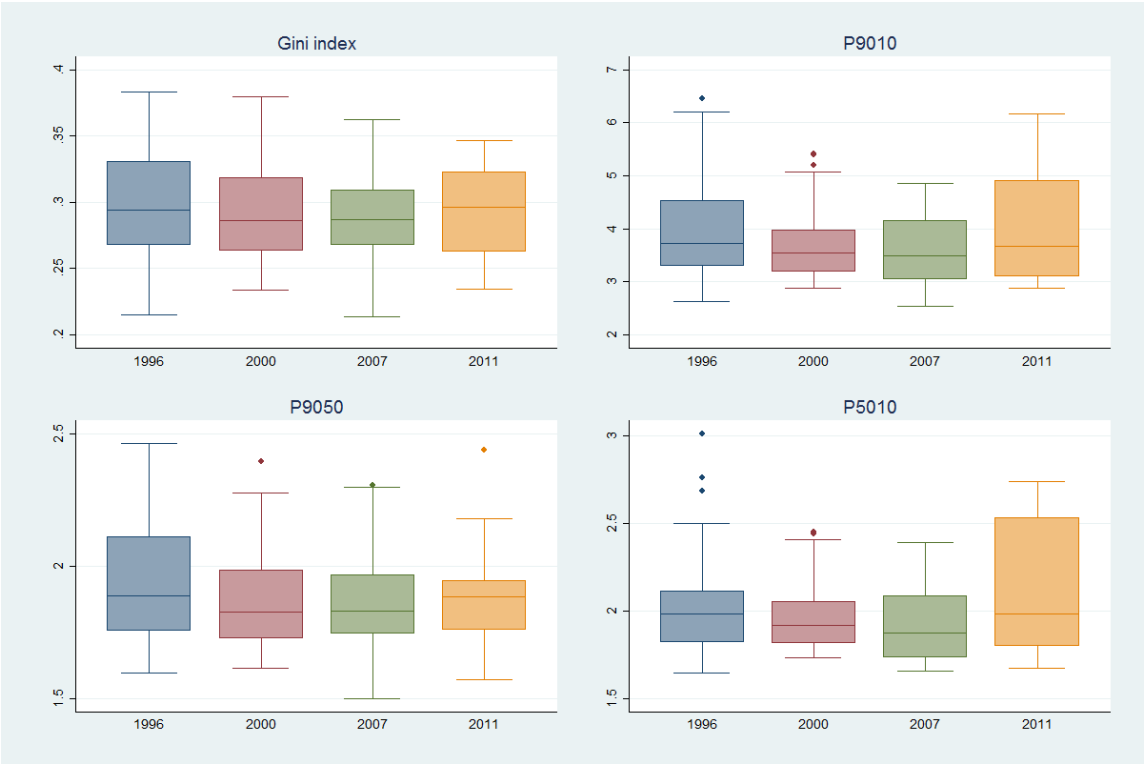
Figure 1. Income inequality in European regions

(a) Gini coefficient in 2007 **(b) change between 2007 and 2011**



Note: Own calculations from ECHP and EU-SILC micro data. Detailed results are shown in the Electronic Supplementary Material. As 2011 data for Belgian and Irish regions is not currently available, we have used the value of the Gini Index for 2010 as a reference year.

Figure 2. Evolution of inequality in European regions: several inequality measures



Note: Own calculations from ECHP and EU-SILC micro data. As 2011 data for Belgian and Irish regions is not currently available, we have used the value of the Gini Index for 2010 as a reference year.

3. Determinants of regional income inequality

The key theoretical approach to weight the elements behind inequality is the work from Simon Kuznets (1955), further developed by Robinson (1976). In this model, an agricultural and rural country develops through industrialisation and urbanisation. The result is, of course, an increase in income per capita but also an increase in inequality. Hence, the model predicts a small and rich group of individuals in urban and industrialized areas in early stages of development. Later on, as the share of poor rural people working in agriculture decreases and the share of people living in cities and working in industries increases, average income per capita continues to rise but income inequality starts to decline. This relationship is known as the Kuznets inverted-U curve, as inequality is positively associated with development at initial stages of industrialisation, and negatively related when the society becomes industrialised.

Figure 3 summarises the relationship between the Gini Index and GDP per capita over time. On average more developed countries display lower inequality levels, in line with the long-run predictions of the Kuznets model. Indeed, Europe is already a developed region and, consequently, we would only be seeing the negative slope of the Kuznets curve. But at a first view there is no inverted-U shape relationship between inequality and development, but the opposite; some of the European regions with higher GDP per capita levels display high levels of inequality.

If we look at the evolution of inequality, and do not only compare regions based on their level of development, most European regions display increasing trends in inequality in recent years, as we have seen. In fact, some of the European regions where inequality has increased the most are among the most developed and where economic growth has been the highest. Previous papers have already suggested that current economic growth patterns, especially in already industrialised countries, may be associated with increasing inequalities (i.e. Davis, 1992, and Freeman and Katz, 1994). Thus, the inverted-U relationship between economic development and inequality may now have an N shape: inequality first increasing, then declining, and finally rising again (i.e. Conceiçao and Galbraith, 2001; Guilera, 2010; Alderson and Doran, 2013).[5] But no paper has identified nor

[5] Harrison and Bluestone (1988) refer to "the Great U-Turn" in relation to the rising inequalities of the late 20th in the U.S. after several decades of declining inequality. Evidence of this "turn" has been found not only for the U.S. but also for other post-industrialised countries. Others, as Conceiçao and Galbraith (2001), refer to an "augmented-Kuznets Curve" to describe the same phenomenon of rising inequalities after the inverted-U experience.

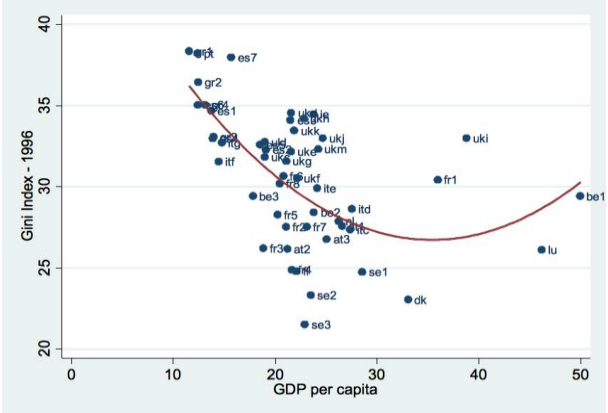
explained yet, in a regional analysis for several countries, this N-shape relationship between development and inequality.

Many factors may help us to explain increasing inequality in relatively industrialized economies. Shifts from agriculture to industry represent transformations of developing countries (the "original" explanation behind the inverted-U curve between development and inequality). But similar changes can be observed in shifts between other sectors, and beyond initial shifts from rural to urban areas. Greenwood and Jovanovic (1990) include changes from basic to more sophisticated sectors in their analysis of the evolution of income distribution. At latter stages of development, one can think, for instance, on changes from low to high value added services, such as from tourism to financial services. Consequently, we may expect that transformations associated with increases in productivity will be associated with increasing income inequality: the introduction of technological innovations may be accompanied with high incomes owned by few persons who get extra benefits of the new technology. In fact, according to Conceiçao and Galbraith (2001), the monopolistic nature of knowledge-intensive goods and services is what drives inequality up in post-industrial economies. On a later stage, however, we may expect that the new technology becomes popular and cheaper. Thus, more skilled workers will benefit from technological innovations, income per capita will expand, and the extra profits of the initial monopoly will vanish. Accordingly, after an initial increasing phase, inequality will tend to decrease, leading to a "new" inverted-U curve.

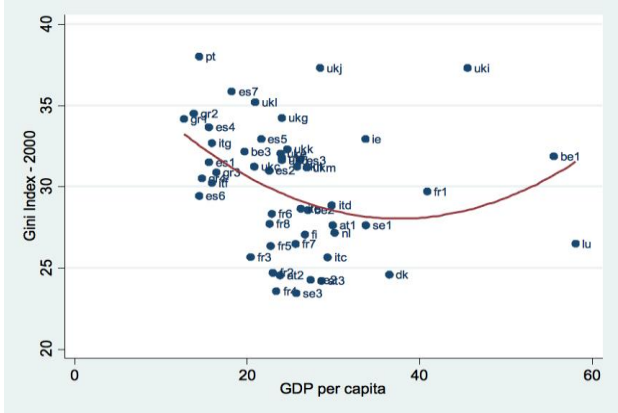
An additional factor that may be associated with increases in inequality is the skill-biased technological progress (see for instance Alderson et al., 2010). Autor et al. (2003) show how the introduction of computerization is associated with reduced labour input of routine tasks and increased labour input of non-routine elements. High skilled workers have an advantage in performing non-routine tasks (problem solving and creative occupations). Low skilled workers have an advantage in performing non-routine manual tasks, such as personal health services, that require adaptability and personal interactions. In the middle part of the distribution, one finds medium-skilled workers, who perform routine tasks based on well-understood procedures. Computerization is complementary to skilled tasks and has no impact on low skill tasks, but it substitutes routine tasks, which are the ones performed by middle wage earners. As far as this technology becomes cheaper and cheaper, salaries of middle-income workers decrease, which contributes to an increase in inequality.

Figure 3. Inequality (Gini Index) and economic development (GDP per capita)

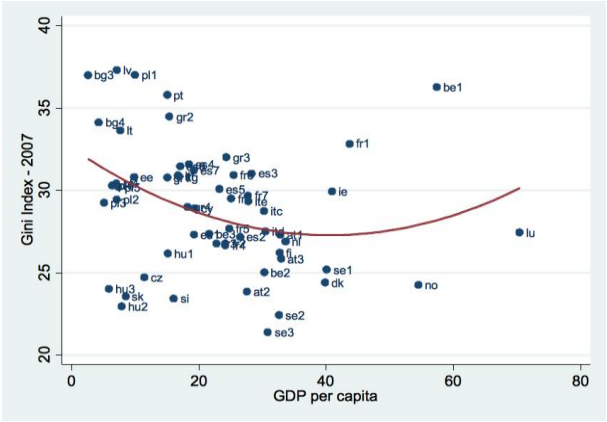
1996



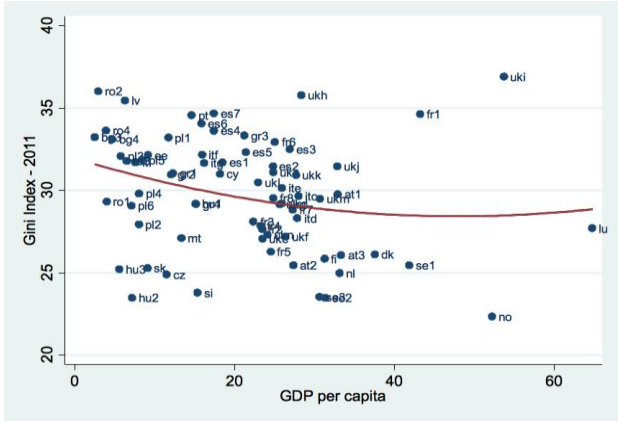
2000



2007



2011



Note: GDP per capita is expressed in thousands 2005 constant price euros per person. Source: Cambridge Econometrics.

In general, other factors affecting the skill-composition in the demand of labour force will tend to affect the distribution of income. Increasing integration with the world economy (i.e. globalisation) is one of these factors, which for developed countries has been argued as potentially leading to higher inequality. The Heckscher-Ohlin and Stolper-Samuelson theorems support the idea that increasing openness intensifies the comparative advantage of developed areas in industries with skill-intensive products. As a consequence, higher inequality can emerge, as increased trade is associated with higher returns of skilled workers. Overall, inequality and trade liberalization would go hand in hand (Kremer and Masking, 2006). This effect is even strengthened by technological change: increased openness increasingly shifts labour from unskilled to skilled sectors in developed economies, as they specialise in the production of skill-intensive products. Jaumotte et al. (2008) and Afonso et al. (2013) find that technological progress and globalisation tend to increase the returns to skills, which subsequently raises inequality (with the contribution of technology being much more important than that of openness, and especially in developed countries).

Finally, institutional factors, including institutional characteristics of the labour market as well as socio-demographic factors, have also been argued as relevant (Castells-Quintana and Royuela, 2012).

The typical empirical strategy for the analysis of inequality consists on regressing an inequality measurement against indicators of the factors derived from theoretical approaches. For instance, the Kuznets curve is analysed by including a linear and a quadratic form of the log of GDP per capita, together with a list of control variables. Barro (2000) includes continental dummies and several institutional variables, such as ethnicity, language, religion, democracy, an indicator of trade openness, which can be linked to the idea of globalization, and also the education attainment levels of population, a variable that can be linked to the idea of technological change.

As already noted, most works studying the determinants of inequality have relied on data at the national level. We believe that the use of regional data can yield important advantages. Not only individuals can be more affected by local conditions than by national issues, but the regional dimension also incorporates a high degree of mobility of the factors of production, particularly labour. Indeed, low levels of mobility are expected to be associated with large spatial disparities in terms economic growth, poverty and stagnation. Using

regional data allows amplifying the effects of small disparities in initial conditions on inequality. In this line, using regional data we are also able to diminish the omitted variable bias that can arise in more aggregated exploration.

Hence, we estimate an empirical model that considers alternative inequality measures against a list of factors, all at the regional level for NUTS1 European regions:

$$Inequality_{it} = \beta_1 GDPpc_{it} + \beta_1 GDPpc_{it}^2 + X_{it}\mathbf{\Gamma} + u_{it} \quad (1)$$

where $Inequality_{it}$ is one of our considered measures for within-region income inequality (*Gini coefficient*, *P9010*, *P5010*or *P9050*) for region i at time t, $GDPpc_{it}$ is the regional GDP per capita (in logs), X_{it} a vector of additional controls, and $u_{i,t}$ a composite error term that includes an unobserved regional-specific effect, a time-specific effect and a stochastic error term. We begin by only including the linear and the quadratic form of the log of the GDP per capita (the Kuznets hypothesis). We then include a list of additional control variables within vector X_{it} to assess the additional factors discussed before: the sectoral composition of the economy (agriculture, construction, financial and business services, and tradable services) together with a measurement of technological change (persons with tertiary education and/or employed in science and technology), population density, and finally a list of institutional variables (family structure, proportion of Christianity and the unemployment rate, as a composite or reduced form measurement of labour market institutions). Appendix 2 displays the definitions and sources of the considered variables, while descriptive statistics and correlations for the variables considered in the empirical analysis are shown in Appendix 3 and Appendix 4, respectively.

We estimate repeated cross-sections (1996, 2000, 2007 and 2011) to be able to analyse if there are substantial changes over time (i.e. before and after the crisis) in the studied relationships, and also to ease comparability with previous works. We also take advantage of the panel structure of our data and estimate using different panel data techniques (Between Estimates, Random Effects and Fixed Effects). In our estimations, standard errors have been clustered by country.

Table 1 shows the cross-section estimates where the Gini index of European regions is regressed against the considered factors over several years. As was previously observed in Figure 3, the Gini index is negatively associated with economic development while we cannot observe any inverted-U shaped curved in any of the considered years. On the

contrary, in several models in 1996 and in 2000 higher inequality is significantly associated with the square of GDP pc. These results are somehow similar to those of Perugini and Martini (2008) who did not find evidence of an inverted-U but of a positive association between development and inequality. As we introduce more controls the significance of the GDP variables decreases.

As expected, the sectoral composition of the economy matters. Once additional countries are included in the sample associated with the EU-SILC survey (most of them new EU member states), a higher share of employment in agriculture is associated with higher inequality levels. A higher share in the construction sector is also positively linked with higher inequality, but only in the period previous to the Great Recession (2007), what can be linked to significant housing bubbles in some countries (like Spain, where we find many of the regions where inequality has soared the most). The weight in services associated with commerce, transport communications and tourism (% Trad Serv) is significantly positive in 1996 and in 2011, while the weight in financial and business services (% Finan Serv) is significantly positive in the first periods. Many of these service sectors are characterised by a high proportion of low-skill jobs and bimodal pay structures. Thus, these results reinforce the idea of current growth patterns in many regions characterised by tertiary specialisation and openness, associated with increasing inequality.

The variable associated with technological change (persons with tertiary education and/or employed in science and technology) when significant, is also positively associated with inequality.

Density also matters and is positively associated with higher levels of inequality. In Figure 1 we saw how some of the capital regions, where density is expected to be high, had relatively higher levels of inequality. Even though urbanisation is associated with development, and consequently one could expect lower inequality in regions with higher density, the Todaro paradox (Harris and Todaro, 1970) explains this kind of results. In this model, the inflow of workers in cities may exceed urban labour demand, even when accompanied by growth of the urban employment. This would result in urban unemployment and, in turn, into higher inequality in cities (and therefore their regions). A positive association between density and inequality is in line with previous studies finding higher inequality in larger urban areas (i.e. Behrens and Robert-Nicoud, 2014). Furthermore, inequality can be associated with agglomeration economies that come with

the spatial accumulation of population and economic activity (Castells-Quintana and Royuela 2014b).

Institutional factors also display significant parameters. Family structure, an index developed at the country level and only measured for one year, seems relevant (see Berthoud and Iacovou 2004 for additional details on this variable). Finally, higher unemployment is positively associated with higher inequality, but interestingly this only happens during the Great Recession (2011).

We have also performed the estimates considering the time series dimension of the data. Table 2 displays the results of the full model considering the between, the fixed-effects and the random-effects models. The basic (OLS) results replicate the main outcomes of the cross-section models. The fixed-effects model, which removes all the cross-section information of the data, also reports similar results as before. One significant difference between the fixed-effects and random-effects estimates lies in the parameters associated with the linear and the quadratic forms of GDP per capita.[6] While in the random-effects estimates these parameters are non-significant, in the fixed-effects estimates they are: negative for the linear form of GDP per capita and positive for its quadratic form (as in several of our cross-section estimates). As fixed-effect estimates only capture the evolution within regions, we interpret this result as evidence that inequality has increased more in regions with higher GDP per capita growth rates. Another difference is the positive and significant parameter for the proportion of highly educated employees working in science and technology. This result again points towards the arguments highlighting the introduction of new technologies being behind increasing inequalities. In this case results would suggest a trade-off between equity and efficiency.

[6] These differences have been tested by means of the difference in parameters and the square root of the main diagonal of the joint variance matrix that uses the Hausman test.

Table 1. Inequality regressions. Cross-section estimates: 1996, 2000, 2007 and 2011

	1996				2000				2007				2011			
	Eq 01	Eq 02	Eq 03	Eq 04	Eq 01	Eq 02	Eq 03	Eq 04	Eq 01	Eq 02	Eq 03	Eq 04	Eq 01	Eq 02	Eq 03	Eq 04
ln GDPpc	-7.022***	-57.580**	-25.990	-88.190**	-3.203	-48.800*	19.890	-50.840	-1.803*	-6.330	-2.027	5.473	-1.296*	-2.580	2.021	-2.359
	(1.908)	(20.200)	(21.090)	(35.740)	(1.844)	(24.140)	(37.070)	(39.720)	(0.962)	(4.922)	(4.539)	(8.578)	(0.754)	(4.257)	(4.547)	(8.528)
ln GDPpc^2		8.145**	2.209	12.300*		7.026*	-4.770	4.779		0.837	-0.023	-1.203		0.248	-0.652	1.089
		(3.1780)	(3.348)	(6.129)		(3.689)	(5.686)	(6.292)		(0.931)	(0.817)	(1.733)		(0.888)	(0.883)	(1.620)
% Agric											39.090**	42.320**			30.590**	
			11.430	11.100*			15.710	13.430			*	*			*	39.460***
			(14.180)	(5.975)			(18.210)	(9.857)			(12.559)	(14.120)			(10.650)	(10.380)
% Constr							98.830*				60.020**					128.600*
			9.927	-32.600**			*	70.180*			*	76.860**			54.070	*
			(45.840)	(13.720)			(44.560)	(38.940)			(19.880)	(29.110)			(39.410)	(55.340)
% Tr Serv																
			22.900	20.770**			16.950	3.933			16.450**	12.200			34.200**	21.380*
			(18.530)	(8.923)			(19.210)	(6.855)			(7.423)	(8.749)			(12.190)	(10.870)
% Fn Serv							71.660*					45.520**				
			61.510*	23.200			*	57.920**			30.800**	*			21.700	18.450
			(27.900)	(17.610)			(26.730)	(20.780)			(13.100)	(15.280)			(19.270)	(30.160)
Empl S&T			-0.069	0.223***			-0.069	0.326***			0.091	0.081			0.090	0.033
			(0.145)	(0.055)			(0.108)	(0.083)			(0.062)	(0.054)			(0.073)	(0.063)
Density			0.007	-0.079**			0.157**	0.138			0.202***	0.245***			0.111	0.570**
			(0.083)	(0.024)			(0.060)	(0.080)			(0.029)	(0.048)			(0.258)	(0.271)
Fam_1								-								
				0.332				11.920***				0.484				3.464
				(2.705)				(2.940)				(2.732)				(2.559)
Fam_2								-								
				-22.280***				26.100***				-6.464*				-10.320*
				(2.009)				(5.336)				(3.747)				(5.261)
Christ.				9.323				37.240***				4.822				1.540
				(7.256)				(8.830)				(6.065)				(5.475)
Unemp				-7.142				-8.656				8.321				20.050***
				(6.093)				(8.393)				(8.556)				(6.221)
Constant	52.020** *	129.600** *	74.240* *	181.500** *	40.180** *	113.400* *	-6.890	143.200*	34.160** *	39.840** *	17.480**	2.470	33.450** *	34.970** *	9.688	-0.776
	(5.608)	(31.040)	(32.290)	(51.690)	(5.445)	(38.460)	(60.970)	(68.130)	(3.013)	(6.320)	(6.934)	(11.770)	(2.086)	(4.711)	(8.321)	(11.010)
Obs	50	50	36	36	50	50	41	41	58	58	56	53	71	71	59	51
R-squared	0.314	0.412	0.741	0.930	0.078	0.170	0.613	0.829	0.106	0.123	0.544	0.585	0.071	0.073	0.444	0.586

Note: Clustered country standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Inequality regressions. Panel estimates: 1993-2011

	Between	Random Effects	Fixed Effects
ln GDPpc	0.119	-5.135	-21.130**
	(0.392)	(7.675)	(8.967)
ln GDPpc^2	-0.019	0.829	2.635*
	(0.076)	(1.300)	(1.484)
% Agricult	1.803***	36.840***	30.520***
	(0.518)	(6.872)	(9.251)
% Construc	5.249***	5.397	-0.688
	(1.573)	(20.510)	(28.830)
% Trad Serv	1.713***	27.780***	36.710*
	(0.557)	(10.320)	(19.260)
% Finan Serv	1.082	-9.669	-14.070
	(1.017)	(18.840)	(19.660)
Empl S&T	0.001	0.047	0.098
	(0.003)	(0.061)	(0.074)
Density	0.012***	0.241***	0.844***
	(0.003)	(0.050)	(0.078)
Fam_1	0.029	0.348	
	(0.093)	(1.804)	
Fam_2	-0.195	-5.883*	
	(0.151)	(3.329)	
Christ.	0.302	-1.130	
	(0.183)	(5.147)	
Unemp	0.950***	4.585	-4.431
	(0.293)	(4.731)	(3.663)
Constant	0.417	30.720**	54.900***
	(0.551)	(13.750)	(13.22)
Observations	699	699	699
Regions	67	67	67
R-squared	0.653	0.366	0.222

Note: Clustered country standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

We have also performed cross-section and panel estimates for the rest of inequality measures considered. Results are reported in Tables 3 to 5. As expected, the *P9010* measurement of inequality estimates report very similar results to the Gini index estimates.

The inequality associated with the left side of the distribution (*P5010*) reports a negative parameter associated with the share in construction in the fixed effects model. As in many regions the Great Recession has been associated with a decline in the construction sector (especially those regions that developed a housing bubble previous to the crisis), the decrease in the employment in the construction sector resulted in a significant increase in inequality, which particularly affected lower incomes. A similar and related result is found for unemployment. A rise in unemployment is associated with a decrease in inequality. A tentative explanation of this result could be related to the fact that job losses could affect with higher intensity to those individuals who are close to median income (as, in fact, those located in the lowest part of the income distribution would be already unemployed). If this is the case, an increase in unemployment will imply a reduction in inequality but not due to a catch-up of poorest individuals, but to income losses of new unemployed. We also see a strongly significant parameter associated with specialisation in tradable sectors, which reinforces our previous findings on the impact of globalisation in the evolution of inequality. As with the share of construction, the effect of the variables associated with specialisation in tradable sectors seems particularly strong in the lower part of the distribution (*P5010*).

When we consider the right side of the distribution (*P9050*) we find different results in the share of employment in the construction sector, positive in levels (cross section and between estimations) and negative in changes (fixed effects estimations). Thus, regions with higher shares of employment in construction display higher levels of inequality, while when this sector improves inequality at the right side of the distribution decreases. In contrast to the results in the lower side of the income distribution, the variables associated with openness and technological intensity do not seem to be strongly associated with inequality. On the contrary, we observe a strong impact of our considered institutional variables. Recent theories (i.e. Acemoglu and Robinson, 2008) highlight institutional failures, associated with rents appropriated by elites, as main factors behind high and persistent levels of inequality.

Table 3. Inequality regressions. Cross-section and panel estimates: P9010

	CS 1996	CS 2000	CS 2007	CS 2011	Between	Random Effects	Fixed Effects
ln GDPpc	-22.640*	-10.010	0.054	-0.650	1.413	-0.281	-2.445
	(10.220)	(8.531)	(1.493)	(2.309)	(1.353)	(1.361)	(1.593)
ln GDPpc^2	3.424*	1.067	-0.073	0.262	-0.271	0.020	0.195
	(1.713)	(1.422)	(0.321)	(0.476)	(0.262)	(0.237)	(0.261)
% Agricult	4.935**	4.716**	5.797**	8.239***	7.406***	13.770***	14.980***
	(1.589)	(1.985)	(2.076)	(2.858)	(1.786)	(2.209)	(2.766)
% Construc	-3.180	13.080**	18.300***	20.300	18.860***	-4.291	-7.010
	(6.542)	(5.485)	(4.224)	(14.430)	(5.426)	(4.269)	(5.732)
% Trad Serv	6.538***	1.252	2.396	7.781***	4.670**	7.798**	10.080**
	(1.846)	(1.202)	(1.742)	(2.538)	(1.920)	(3.439)	(4.262)
% Finan Serv	-1.440	8.998*	7.384**	3.364	5.877*	2.588	3.262
	(4.524)	(4.342)	(2.673)	(7.551)	(3.509)	(3.334)	(2.937)
Empl S&T	0.037*	0.052**	0.010	-0.003	0.002	0.000	0.013
	(0.019)	(0.022)	(0.008)	(0.012)	(0.011)	(0.012)	(0.012)
Density	-0.003	0.024*	0.041***	0.100	0.043***	0.036***	0.168***
	(0.011)	(0.013)	(0.006)	(0.062)	(0.010)	(0.010)	(0.021)
Fam_1	0.451	-1.885**	0.082	0.774	0.142	0.031	
	(0.834)	(0.749)	(0.462)	(0.662)	(0.320)	(0.398)	
Fam_2	-3.787***	-4.130***	-0.824	-1.107	-1.356**	-0.259	
	(0.753)	(0.992)	(0.937)	(1.131)	(0.522)	(0.964)	
Christ.	0.412	5.966**	0.979	0.254	0.762	-0.906	
	(2.106)	(2.075)	(0.954)	(1.120)	(0.632)	(1.103)	
Unemp	0.557	-0.740	1.839	4.572***	2.685**	1.420	-0.764
	(1.674)	(2.734)	(1.448)	(1.220)	(1.010)	(0.992)	(0.651)
Constant	39.760**	24.360*	-0.141	-3.290	-2.201	2.147	5.162*
	(15.510)	(13.210)	(1.879)	(2.783)	(1.902)	(2.886)	(2.914)
Observations	36	41	53	51	699	699	699
Regions					67	67	67
R-squared	0.896	0.818	0.659	0.659	0.637	0.348	0.449

Note: Clustered country standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 4. Inequality regressions. Cross-section and panel estimates: P5010

	CS 1996	CS 2000	CS 2007	CS 2011	Between	Random Effects	Fixed Effects
ln GDPpc	-4.269	-2.285	-0.373	0.049	0.119	0.041	-0.812
	(4.719)	(2.814)	(0.401)	(0.761)	(0.392)	(0.393)	(0.609)
ln GDPpc^2	0.692	0.272	0.049	0.036	-0.019	-0.020	0.048
	(0.825)	(0.463)	(0.086)	(0.165)	(0.076)	(0.071)	(0.100)
% Agricult	1.849**	1.480**	1.106*	2.402*	1.803***	3.869***	4.958***
	(0.653)	(0.558)	(0.615)	(1.297)	(0.518)	(0.598)	(0.547)
% Construc	-3.495	1.323	5.794***	0.612	5.249***	-1.116	-1.773
	(4.100)	(1.700)	(1.215)	(6.071)	(1.573)	(1.282)	(1.739)
% Trad Serv	2.758*	0.960***	1.233*	2.344**	1.713***	3.000***	4.499***
	(1.285)	(0.260)	(0.602)	(0.915)	(0.557)	(1.011)	(1.279)
% Finan Serv	-1.242	1.115	1.657*	0.190	1.082	1.203	2.024*
	(3.872)	(1.412)	(0.815)	(2.792)	(1.017)	(1.050)	(1.065)
Empl S&T	0.003	0.013	0.002	-0.002	0.001	-0.001	0.002
	(0.006)	(0.007)	(0.003)	(0.005)	(0.003)	(0.004)	(0.005)
Density	0.000	0.006	0.009***	0.034	0.012***	0.006**	0.034**
	(0.007)	(0.004)	(0.002)	(0.021)	(0.003)	(0.003)	(0.015)
Fam_1	0.456	-0.407*	-0.001	0.206	0.029	-0.021	
	(0.343)	(0.219)	(0.140)	(0.263)	(0.093)	(0.143)	
Fam_2	-0.664**	-1.020***	-0.071	-0.024	-0.195	0.140	
	(0.247)	(0.300)	(0.326)	(0.454)	(0.151)	(0.282)	
Christ.	-0.393	1.608**	0.292	0.160	0.302	-0.156	
	(1.195)	(0.632)	(0.246)	(0.382)	(0.183)	(0.314)	
Unemp	0.445	0.076	0.667*	1.040**	0.950***	0.348	-0.446*
	(1.043)	(0.846)	(0.368)	(0.447)	(0.293)	(0.312)	(0.236)
Constant	7.599	6.208	1.224**	-0.108	0.417	1.012	2.231**
	(6.746)	(4.444)	(0.538)	(0.963)	(0.551)	(0.835)	(0.898)
Observations	36	41	53	51	699	699	699
Regions					67	67	67
R-squared	0.835	0.777	0.647	0.588	0.653	0.362	0.362

Note: Clustered country standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Inequality regressions. Cross-section and panel estimates: P9050

	CS 1996	CS 2000	CS 2007	CS 2011	Between	Random Effects	Fixed Effects
ln GDPpc	-6.956*	-3.141*	0.427	-0.216	0.590	-0.086	-0.454
	(3.155)	(1.642)	(0.512)	(0.518)	(0.377)	(0.216)	(0.277)
ln GDPpc^2	1.015*	0.331	-0.089	0.067	-0.113	0.023	0.052
	(0.553)	(0.274)	(0.102)	(0.097)	(0.073)	(0.037)	(0.045)
% Agricult	0.244	0.733	1.942***	1.850***	1.821***	2.063***	1.764***
	(0.454)	(0.474)	(0.659)	(0.490)	(0.498)	(0.267)	(0.315)
% Construc	2.038	4.834***	3.644**	8.552***	3.888**	-0.477	-1.385**
	(2.271)	(1.330)	(1.293)	(2.564)	(1.512)	(0.480)	(0.543)
% Trad Serv	0.693	-0.117	0.000	1.533**	0.705	0.640*	0.450
	(0.988)	(0.330)	(0.545)	(0.580)	(0.535)	(0.349)	(0.514)
% Finan Serv	0.072	3.125***	2.138**	1.408	1.738*	-0.204	-0.454
	(2.591)	(0.799)	(0.953)	(1.307)	(0.978)	(0.412)	(0.437)
Empl S&T	0.015**	0.013***	0.004	0.000	-5.58e-05	6.16e-05	0.002
	(0.005)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Density	-0.001	0.006	0.012***	0.016	0.009***	0.012***	0.049***
	(0.004)	(0.004)	(0.002)	(0.014)	(0.003)	(0.002)	(0.007)
Fam_1	-0.152	-0.514***	0.051	0.190*	0.070	0.106*	
	(0.218)	(0.146)	(0.130)	(0.103)	(0.089)	(0.064)	
Fam_2	-1.209***	-1.086***	-0.321*	-0.536***	-0.508***	-0.366***	
	(0.170)	(0.213)	(0.154)	(0.167)	(0.145)	(0.135)	
Christ.	0.407	1.330***	0.221	-0.003	0.073	-0.206	
	(0.711)	(0.396)	(0.292)	(0.255)	(0.176)	(0.153)	
Unemp	-0.095	-0.417	0.274	1.105***	0.399	0.497***	0.070
	(0.683)	(0.548)	(0.458)	(0.319)	(0.281)	(0.109)	(0.132)
Constant	13.960**	8.595***	0.520	0.278	0.386	1.751***	2.503***
	(4.516)	(2.507)	(0.670)	(0.608)	(0.530)	(0.364)	(0.409)
Observations	36	41	53	51	699	699	699
Regions					67	67	67
R-squared	0.787	0.817	0.554	0.659	0.546	0.303	0.261

Note: Clustered country standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

4. Concluding remarks and policy issues

In this paper we have empirically analysed the main trends and factors behind the evolution of income inequality within European regions over the last decades and paying special attention to pre- and post-Great Recession dynamics. In particular, we have tried to explain the recent increase in income inequality that many European regions have experienced. We have considered several measures of inequality and have explored cross-section as well as panel data estimation techniques. Our results show that the evolution of inequality is significantly more heterogonous in Europe when regions, rather than countries, are considered. In general terms, while inequality tended to decrease in most European regions previous to the crisis, it increased severely in many of them afterwards.

Concerning the determinants considered we have found evidence of the relevance of the sectoral composition of the economy, population density, unemployment, and institutional factors. Regarding the sectoral composition of the economy, we found that higher shares of employment in agriculture and tradable sectors are associated with higher inequality. A higher share in the construction sector was also found positively linked with higher inequality, but only in the period before the Great Recession, which we have interpreted as linked to housing bubbles in some countries like Spain.

These results suggest that tertiary specialisation, openness and technological change, although likely to be associated with economic growth, are also associated with increasing inequalities.

In line with our results, policy makers in Europe concerned with distributional issues should pay attention to current patterns of specialisation, as these trends can be driving inequality levels up, especially after the crisis. Regions specialising in sectors like tourism and construction seem particularly at risk. Likewise, while economic growth driven by structural and technological change may be positive, high levels of inequality can be socially and economically detrimental in the long run (as has already been widely highlighted in the literature). In any case, a close analysis of inequality trends and their determinants not only between regions but also within regions seems relevant and deserves further research.

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APPENDIX 1. Regions considered (NUTS 1 regions in ECHP and SILC) - continues

		NUTS 1 REGION		ECHP		EU-SILC
1	AT1	OSTÖSTERREICH	1	AT1	1	AT1
2	AT2	SÜDÖSTERREICH	2	AT2	2	AT2
3	AT3	WESTÖSTERREICH	3	AT3	3	AT3
4	BE1	RÉGION DE BRUXELLES-CAPITALE/BRUSSELS	4	BE1	4	BE1
5	BE2	VLAAMS GEWEST	5	BE2	5	BE2
6	BE3	RÉGION WALLONNE	6	BE3	6	BE3
7	BG3	SEVERNA I YUGOIZTOCHNA BULGARIA			7	BG3
8	BG4	YUGOZAPADNA I YUZHNA TSENTRALNA BULGARIA			8	BG4
9	CH	SWITZERLAND			9	CH0
10	CY0	ΚΥΠΡΟΣ (KÝPROS)			10	CY0
11	CZ0	ČESKÁ REPUBLIKA			11	CZ0
12	DE1	BADEN-WÜRTTEMBERG	7	DE1	12	DE1
13	DE2	BAYERN	8	DE2	13	DE2
14	DE3	BERLIN	9	DE3	14	DEA
15	DE4	BRANDENBURG	10	DE4	15	DECE
16	DE5	BREMEN	11	DE5	16	DENE
17	DE6	HAMBURG	12	DE6	17	DENW
18	DE7	HESSEN	13	DE7		
19	DE8	MECKLENBURG-VORPOMMERN	14	DE8		
20	DE9	NIEDERSACHSEN	15	DE9		
21	DEA	NORDRHEIN-WESTFALEN	16	DEA		
22	DEB	RHEINLAND-PFALZ	17	DEX		
23	DEC	SAARLAND				
24	DED	SACHSEN	18	DED		
25	DEE	SACHSEN-ANHALT	19	DEE		
26	DEF	SCHLESWIG-HOLSTEIN	20	DEF		
27	DEG	THÜRINGEN	21	DEG		
28	DK0	DANMARK	22	DK0	18	DK0
29	EE0	EESTI			19	EE0
30	EL1	VOREIA ELLADA	23	GR1	20	EL1
31	EL2	KENTRIKI ELLADA	24	GR2	21	EL2
32	EL3	ATTIKI	25	GR3	22	EL3
33	EL4	NISIA AIGAIOU, KRITI	26	GR4	23	EL4
34	ES1	NOROESTE	27	ES1	24	ES1
35	ES2	NORESTE	28	ES2	25	ES2
36	ES3	COMUNIDAD DE MADRID	29	ES3	26	ES3
37	ES4	CENTRO (ES)	30	ES4	27	ES4
38	ES5	ESTE	31	ES5	28	ES5
39	ES6	SUR	32	ES6	29	ES6
40	ES7	CANARIAS	33	ES7	30	ES7
41	FI	FINLAND	34	FI	31	FI
42	FR1	ÎLE DE FRANCE	35	FR1	32	FR1
43	FR2	BASSIN PARISIEN	36	FR2	33	FR2
44	FR3	NORD - PAS-DE-CALAIS	37	FR3	34	FR3
45	FR4	EST	38	FR4	35	FR4
46	FR5	OUEST	39	FR5	36	FR5
47	FR6	SUD-OUEST	40	FR6	37	FR6
48	FR7	CENTRE-EST	41	FR7	38	FR7
49	FR8	MÉDITERRANÉE	42	FR8	39	FR8
50	HR0	CROACIA			40	HR0
51	HU1	KÖZÉP-MAGYARORSZÁG			41	HU1
52	HU2	DUNÁNTÚL			42	HU2
53	HU3	ALFÖLD ÉS ÉSZAK			43	HU3
54	IE0	IRELAND	43	IE0	44	IE0
55	IS0	ICELAND			45	IS0
56	ITC	NORD-OVEST	44	ITC	46	ITC
57	ITF	SUD	45	ITF	47	ITF
58	ITG	ISOLE	46	ITG	48	ITG
59	ITH	NORD-EST	47	ITH_D	49	ITH_D
60	ITI	CENTRO (IT)	48	ITI_E	50	ITI_E

APPENDIX 1. Regions considered (NUTS 1 regions in ECHP and SILC) - continuation

		NUTS 1 REGION		ECHP		EU-SILC
61	LT0	LIETUVA			51	LT0
62	LU0	LUXEMBOURG	49	LU0	52	LU0
63	LV0	LATVIJA			53	LV0
64	MT0	MALTA			54	MT0
65	NL	NETHERLANDS	50	NL	55	NL
66	NO0	NORWAY			56	NO0
67	PL1	REGION CENTRALNY			57	PL1
68	PL2	REGION POŁUDNIOWY			58	PL2
69	PL3	REGION WSCHODNI			59	PL3
70	PL4	REGION PÓŁNOCNO-ZACHODNI			60	PL4
71	PL5	REGION POŁUDNIOWO-ZACHODNI			61	PL5
72	PL6	REGION PÓŁNOCNY			62	PL6
73	PT	PORTUGAL	51	PT	63	PT
74	RO1	MACROREGIUNEA UNU			64	RO1
75	RO2	MACROREGIUNEA DOI			65	RO2
76	RO3	MACROREGIUNEA TREI			66	RO3
77	RO4	MACROREGIUNEA PATRU			67	RO4
78	SE1	ÖSTRA SVERIGE	52	SE1	68	SE1
79	SE2	SÖDRA SVERIGE	53	SE2	69	SE2
80	SE3	NORRA SVERIGE	54	SE3	70	SE3
81	SI0	SLOVENIJA			71	SI0
82	SK0	SLOVENSKO			72	SK0
83	UKC	NORTH EAST (ENGLAND)	55	UK1	73	UKC
84	UKD	NORTH WEST (ENGLAND)	56	UK8	74	UKD
85	UKE	YORKSHIRE AND THE HUMBER	57	UK2	75	UKE
86	UKF	EAST MIDLANDS (ENGLAND)	58	UK3	76	UKF
87	UKG	WEST MIDLANDS (ENGLAND)	59	UK7	77	UKG
88	UKH	EAST OF ENGLAND	60	UK4	78	UKH
89	UKI	LONDON			79	UKI
90	UKJ	SOUTH EAST (ENGLAND)	61	UK5	80	UKJ
91	UKK	SOUTH WEST (ENGLAND)	62	UK6	81	UKK
92	UKL	WALES	63	UK9	82	UKL
93	UKM	SCOTLAND	64	UKA	83	UKM
94	UKN	NORTHERN IRELAND	65	UKB	84	UKN

APPENDIX 2. Variables definition and sources

Label	Definition	Source
Gini index	Gini coefficient for income	Eurostat ECHP / EU-SILC
P9010	Ratio between the ninth and the first income decile	Eurostat ECHP / EU-SILC
P5010	Ratio between the fifth and the first income decile	Eurostat ECHP / EU-SILC
P9050	Ratio between the ninth and the fifth decile	Eurostat ECHP / EU-SILC
GDP pc	GDP per capita: Gross Domestic Product, deflated to 2005 constant price euros, over total population	Cambridge Econometrics
% Agricult	Agricultural Share: Proportion of employed persons working in Agriculture over total Employed persons	Cambridge Econometrics
% Construc	Construction Share: Proportion of employed persons working in Construction over total Employed persons	Cambridge Econometrics
% Trad Serv	Tradable Services Share: Proportion of employed persons working in wholesale, retail, transport & distribution, communications, and hotels & catering, over total Employed persons	Cambridge Econometrics
% Finan Serv	Financial Services Share: Proportion of employed persons working in financial & business services, over total Employed persons	Cambridge Econometrics
Empl S&T	Persons with tertiary education (ISCED) and/or employed in science and technology	Eurostat
Density	Population density	Eurostat
Fam_1	Family Structure. Factor 1 out of a principal components study built using six variables. Cross-section information at the national level.	Berthoud and Iacovou (2004)
Fam_2	Family Structure. Factor 2 out of a principal components study built using six variables. Cross-section information at the national level.	Berthoud and Iacovou (2004)
Christ.	Christianity: proportion of population following any kind of Christian group (Catholic Church, Protestantism, Orthodox Church …). Cross-section information at the national level.	http://en.wikipedia.org/wiki/Christianity_by_country
Unemp	Unemployment rate: proportion of unemployment. Unemployment levels computed as the difference between active population and employed persons	Cambridge Econometrics

APPENDIX 3: Descriptive Statistics

	Mean	Std. Dev.			Min	Max	Obs	Regions	Av Period
		overall	between	within					
Gini Index	0.302	0.040	0.036	0.020	0.214	0.465	942	78	12.1
p9010	3.947	0.885	0.807	0.441	2.536	8.128	942	78	12.1
p5010	2.029	0.284	0.254	0.164	1.583	3.651	942	78	12.1
p9050	1.927	0.207	0.185	0.103	1.501	3.218	942	78	12.1
ln GDPpc	2.712	0.801	0.788	0.172	0.519	4.255	1650	75	22.0
% Agricult	0.093	0.103	0.099	0.030	0.000	0.537	1650	75	22.0
% Construc	0.073	0.020	0.017	0.010	0.027	0.156	1650	75	22.0
% Trad Serv	0.256	0.049	0.046	0.016	0.120	0.425	1650	75	22.0
% Finan Serv	0.117	0.058	0.056	0.018	0.015	0.351	1650	75	22.0
Empl S&T	957.9	724.3	697.3	208.8	41.0	4699.0	1203	78	15.4
Density	349.1	921.5	864.8	52.1	2.5	7131.1	1461	78	18.7
Fam_1	2.799	0.569	0.573	0	2.04	3.98	1474	67	22.0
Fam_2	0.651	0.196	0.198	0	0.19	0.99	1474	67	22.0
Christ.	0.747	0.168	0.170	0	0.207	0.98	1474	67	22.0
Unemp	0.075	0.114	0.106	0.042	-0.771	0.312	1650	75	22.0

APPENDIX 4: Correlation matrix

	Gini Index	p9010	p5010	p9050	ln GDPpc	% Agricult	% Construc	% Trad Serv	% Finan Serv	Empl S&T	Density	Fam_1	Fam_2	Christ.
p9010	0.877													
p5010	0.716	0.931												
p9050	0.918	0.874	0.641											
ln GDPpc	-0.215	-0.316	-0.300	-0.259										
% Agricult	0.303	0.439	0.444	0.314	-0.601									
% Construc	0.110	0.226	0.253	0.148	-0.166	0.130								
% Trad Serv	0.309	0.362	0.396	0.257	0.064	-0.028	0.254							
% Finan Serv	-0.054	-0.225	-0.277	-0.090	0.751	-0.683	-0.309	0.031						
Empl S&T	-0.076	-0.132	-0.131	-0.099	0.246	-0.304	-0.127	-0.061	0.392					
Density	0.284	0.110	0.024	0.218	0.355	-0.257	-0.383	0.031	0.571	0.003				
Fam_1	0.320	0.433	0.449	0.331	-0.696	0.514	0.448	0.116	-0.493	-0.185	-0.153			
Fam_2	-0.032	0.150	0.274	-0.045	-0.134	0.345	0.332	0.110	-0.305	0.006	-0.170	0.542		
Christ.	0.169	0.290	0.363	0.134	-0.252	0.529	0.240	0.083	-0.385	-0.323	-0.147	0.597	0.589	
Unemp	-0.013	0.136	0.196	0.017	-0.486	0.206	0.095	0.030	-0.593	0.096	-0.623	0.182	0.113	0.017