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Welfare regimes and the incentives to work and get educated

by

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Abstract

This paper examines whether differences in welfare regimes shape the incentives to work and get educated. Using microeconomic data for more than 100,000 European individuals, the results show that welfare regimes make a difference for wages and education. First, people- and household-based effects (internal returns to education and household wage and education externalities) generate socioeconomic incentives for people to get an education and work, which are stronger in countries with the weakest welfare systems, i.e. those with what is known as 'Residual' welfare regimes (Greece, Italy, Spain and Portugal). Second, place-based effects, and more specifically differences in regional wage per capita and educational endowment and in regional interpersonal income and educational inequality, also influence wages and education in different ways across welfare regimes. Place-based effects have the greatest incidence in the Nordic Social-Democratic welfare systems. These results are robust to the inclusion of a large number of people- and place-based controls.

Keywords: Education, employment, wages, welfare, regions, European Union

JEL: H53, H75, I31, I38, J38

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Welfare regimes and the incentives to work and get educated

1. Introduction

Do differences in welfare regimes create incentives (and/or disincentives) to work and get educated? While existing literature often hypothesises that cross-national differences in welfare regimes – once people- and place-based effects are controlled for – may make a difference for levels of wage and education (Bartik, 2002), this has rarely been tested. Most studies on how the welfare state and the different forms it adopts affect individuals have traditionally focused on a fairly narrow range of questions, like the effects of taxes and social security on labour supply (Sandmo, 1995). There has been limited research on the impact of the welfare state on work and human capital investment incentives, which may be harder to measure and have longer-term effects (Sandmo, 1995). This is a significant omission in the literature and the analysis performed here represents an attempt to fill in this gap.

Our starting point is that differences in inequality, in social policies, in labour market rigidities and in regional unemployment, in family policies, in educational and employment policies and in social norms generate a series of people- and place-based effects, which shape the incentives of individuals to work and get educated across regions of the EU. These incentives and disincentives to work and get educated, in turn, affect the overall wage and education attainment levels for an individual. The factors which shape the incentives and disincentives to work and get an education are vast and it is not the aim of this paper to test every mechanism influencing them. Our aim is simply to focus and understand the role a welfare regime can play in encouraging or discouraging work and educational attainment using knowledge stemming from diverse disciplines.

In order to test whether different welfare regimes shape the incentives to work and get educated across regions in the EU, we use panel data extracted from the European Community Household Panel (ECHP) data survey. We take as our reference Esping-Andersen's (1990) classic four tier division of welfare state regimes: 'Liberal' Anglo-Saxon, 'Social-democratic', 'Corporatist' or 'Conservative', and 'Residual' or 'Southern' welfare regimes. We use this classification as it is not only the best known and established division of welfare regimes, but as it also specifically focuses on the

relationship between the state and the market with respect to providing income (i.e. earnings) and services (i.e. education) (Geist, 2005: 25).

The remainder of this paper is structured as follows. Section 2 discusses the theoretical underpinnings of the welfare-state and labour-market literature. In this section, we first deal with the conceptual framework of the welfare state in Europe, before focusing explicitly on the main research question. Section 3 introduces the empirical specifications about the potential impacts of differences in welfare regimes on the levels of wage and educational attainment. Section 4 presents the regression results of the empirical specifications and checks the robustness of the estimates. The final section synthesises the empirical results, draws some implications for policy and discusses directions for future research.

2. Welfare regimes and the incentives to work and get an education

2.1 The welfare state in Europe

The welfare state has often been considered as a promoter of efficiency, on the one hand, and as a system for securing social integration, cohesion, prosperity and justice, on the other, via state interventions in the economy. The welfare state umbrella covers a wide range of governmental activities and formal care provisions, which include both cash benefits (i.e. unemployment, old-age, disability, sickness and family cash transfers) and in-kind services (i.e. education and health insurance, child care and elderly care). The welfare state also provides a certain insurance for individuals against market risks through the financing and delivery of public welfare goods and services (Pierson, 2001; Svallfors, 2004).

There is, however, no universal form of welfare state. Despite the fact that European market integration has been remodelling welfare states which increasingly find themselves bound into and caught up in a complex multi-tiered policy-making system which links the national social policies more closely together (Leibfried, 2000), differences in national welfare systems are as strong as ever. Esping-Andersen (1990) distinguishes between four different basic welfare regimes:

a) *Liberal Anglo-Saxon* (United Kingdom, Ireland), with its tradition of targeted assistance and modest universal transfers or social insurance schemes. This is the most market-oriented among welfare regimes;

b) *Social-democratic* (Scandinavia), with its comprehensive, universalistic and women-friendly approach and with its breaking down of the barriers between working class and middle class beneficiaries and by entitlement of a social right;

c) *Corporatist or Conservative* (Central Continental Europe), in which social benefits are strongly tied to regular employment. This welfare system emphasises subsidiarity, has been in part shaped religious beliefs and is still often committed to the preservation of traditional family values;

d) *'Residual', 'Mediterranean' or 'Southern'* (Portugal, Spain, Italy, Greece), where family policy is relatively underdeveloped and the range and coverage of benefits less widespread than in the other regimes (Esping-Andersen and Sarasa, 2002; Hamnett, 2009).

Although the boundaries among the different welfare state systems are not well defined, the above classification assumes that a country belongs to only one welfare regime. In addition, this classification allows for the examination of cross-national differences without focusing on the idiosyncrasies of single countries as the goal is to investigate the effects of more general institutional arrangements on wage and education (Geist, 2005). This classification helps to focus on some important aspects and to identify similarities and differences which are shaped over time by a complex array of historical, cultural, social, economic and political factors.

2.2 Potential impact of welfare regimes on wage and education

Cross-country differences in welfare regimes create incentives and/or disincentives to work and get educated, making, in turn, a difference for wages and educational attainment levels. We ground this hypothesis on a series of fundamental theoretical mechanisms which make welfare state an important factor shaping individual

decisions to get more or less education and to work or not work. These mechanisms, which incorporate both people- and place-based effects, include differences in inequalities, in social policies, in labour market rigidities and in regional unemployment, in family policies, in educational and employment policies and in social norms. As mentioned earlier, this paper does not try to test this vast array of mechanisms, but to understand how differences in welfare systems shape their role in affecting an individual's education and earning potential.

Differences in inequalities

The welfare state includes an important income redistribution component which carries a spatial (i.e. regional) dimension (Hansen and Jensen-Butler, 1996). If, for instance, there is a high degree of wage inequality, the labour market returns to education are high, creating incentives to get educated. This is because acquiring skills not possessed by everyone would yield greater individual returns to education in less than in more egalitarian societies (Wolf, 2002). But, even egalitarian societies, which reward acquiring complementary skills (Easterly, 2001), will produce incentives to get educated and especially reward those with the highest level of skills. Hence, the optimal level of schooling for a given individual depends not only on his/her investments, but also on those of others (Becker and Chiswick, 1966). What others do in our immediate geographical environment influence and generate incentives for us to pursue greater or lower levels of education and to work or not to work and at what level (Easterly, 2001). In addition, workers may benefit from the skills of their managers and co-workers because they are likely to share common production technologies and may engage in knowledge sharing (Kirby and Riley, 2008; Mion and Naticchioni, 2009). Knowledge, which is likely to leak from one person to another, attains its maximum returns in areas with a high concentration of high-skilled individuals (Easterly, 2001: 146). This implies that if knowledge has a big economic payoff, people will respond to this incentive by accumulating knowledge (Easterly, 2001: 148). Hence, the returns to education are inversely proportional to the number of people who get educated, but there is also a greater incentive to get educated when there are other complementary educated individuals in the same region (Tselios, 2008).

The regional division of welfare relates to geographical differences in the overall structure and organisation of welfare (Hamnett, 2009) and thus to geographical differences in inequality levels. But, interpersonal income and educational inequality in the regions of Western Europe are not evenly distributed. Tselios (2008) and Rodríguez-Pose and Tselios (2009) show that income and educational inequality is lower in Social-democratic welfare states and higher in countries with Residual welfare regimes. This is likely to denote that a country's welfare policy has an important effect on income and educational redistribution and thus on income and educational inequality. Tselios (2008) also shows that variation in income and educational inequality within welfare regimes is lower than across them. This is because income and human capital flows are stronger among regions that are not only geographically close to one another, but also belong to the same welfare regime due to historical, cultural, social, language, and other institutional similarities (Zafirovski, 2000; Schettkat, 2003). In addition, not only are spillovers geographically bounded within a limited space (Feldman, 2000; Crescenzi *et al.*, 2007), but also they are more easily captured within welfare state boundaries (Tselios, 2008). As most of the differences in income inequality are at the bottom of the distribution, welfare state transfers and the targeting of different groups – i.e. through universal or means-tested benefits – create substantial incentives (and/or disincentives) to get educated. The Scandinavian countries have made the biggest effort to reduce income inequality. Liberal countries, by contrast, are less concerned with inequality, while countries with Corporatist welfare regimes in continental Europe, have achieved less equality than Scandinavia, despite devoting a considerable amount of resources to this goal (Garfinkel *et al.*, 2006).

Differences in social policies: the distributive clash between children and the elderly

The well-being of tomorrow's elderly depends on the welfare of tomorrow's labour force, which implies that future pensioner welfare is conditional on the life chances of children now (Esping-Andersen and Sarasa, 2002). However, as the population ages, European countries and regions "confront the same social and demographic problems that all developed welfare states do: falling birth rates and increasing longevity subvert the financial structure of most pension insurance systems. Medical progress and increased longevity lead to a continuous growth of health costs" (Leibfried, 2000:

57). Given perceived budgetary limits and little room for additional taxation, welfare regimes increasingly face the dilemma of policies in favour of the elderly or the young. A worsening welfare of children, for instance, may coincide with steady improvement among the elderly. Families with children may lose out if the welfare state devotes too much to the elderly (Esping-Andersen and Sarasa, 2002). Conversely, rising expenditure allocations in favour of the elderly may create incentives for early retirement and thus disincentive to work. An increase in expenditure allocations in favour of families with children will have different consequences.

These challenges are being met differently by welfare state regimes. a) In Corporatist regimes, a preference for family policies, often reproducing traditional gender roles, is creating gender differences in working patterns and, to a certain extent, excluding female talent from the labour force. Policies in Austria and Germany encouraging, among other things, women to stay at home while the children are small[1] are generating disincentives to work (Bettio and Plantenga, 2004: 106). b) In Social-democratic regimes, the availability, quality and affordability of public care services has enabled women to have children without affecting their careers and thus encouraged women's participation in the labour market (Esping-Andersen, 2002). The Scandinavian Social-democratic welfare states also guarantee higher levels of pensioner income security and are generally considered better prepared to meet the challenges of ageing than countries with alternative welfare states (de Beer, 2007). c) In Liberal welfare regimes, 'individualism supports the idea of equality of men and women without actively promoting a specific gender division of labour' (Geist, 2005: 26). These regimes emphasise the principle of individual freedom and target benefits only at those in greatest need (Repo, 2004). Formal childcare, for instance, is generally provided by the market (Repo, 2004). d) Finally, the Residual welfare states of Southern Europe, which rely more heavily than other welfare states on informal family care, run a particular risk of inhibiting female participation in the labour force. 'Since childcare services are not available or are unaffordable, women with less education might find it more profitable to quit employment if they cannot rely on

[1] Reinforced by factors such as the shortage of public day care and the fact that family supplements and tax deductions are used to support the income of men rather than women (Svallfors, 2004: 122).

grandparents, neighbours, or other informal cheap care arrangements' (Bettio and Plantenga, 2004: 103).

Differences in labour market rigidities and in regional unemployment

Labour market rigidities, such as unemployment benefits and high taxes are a further factor creating incentives and/or disincentives to work and get educated.

First, generous unemployment benefits may disincentivise work. 'The level of unemployment compensation sets the reservation wage, which determines the demand for workers; at the same time, these benefits determine work incentives and, hence, the choice to work or remain unemployed' (Howell and Rehm, 2009: 61). On the labour demand side, generous benefits may have unemployment effects through the wage-setting process by increasing individuals' wage claims or by encouraging unions to bargain for higher wages; on the labour supply side, a more generous compensation alters the trade-off between the costs and benefits of working, offering workers leisure at a lower cost (Howell and Rehm, 2009). As a result, 'the higher the replacement rate, the more likely the worker will opt for unemployment, and the longer the potential duration of benefits, the longer will be the actual spell of unemployment' (Howell and Rehm, 2009: 63). Generous benefits may also exert negative incentives on individual labour market behaviour, resulting in a reduction of the labour supply and a rise in welfare state dependence (de Beer, 2007: 376). This welfare dependency 'is higher for individuals who have experienced welfare support to their families during childhood and youth' (Heinemann, 2008: 241).

Generous unemployment benefits can, however, also have the opposite effect. Welfare reforms may push welfare recipients into the labour force, provide monetary and non-monetary incentives to recipients for working, give wage subsidies to employers, and provide community service jobs (Bartik, 2002). Programmes, for example, which offer generous benefits, but require participation in effective active labour market programmes can enhance skills, improve employability, and encourage greater risk-taking behaviour by workers (Agell, 1999; Howell and Rehm, 2009). Social-democratic welfare regimes have specialised in this positive synergy between active labour market programmes and a generous benefits system.

Unemployment benefits also have contrasting effects on education. While, on the one hand, unemployment benefit 'is likely to reduce incentives in education, as it guarantees a minimum income independent of individual effort and productivity; on the other hand, by reducing uncertainty concerning future income, an unemployment benefit will encourage the risk averse individuals to invest more. Whether the aggregate effect on educational investment will be positive or negative depends on which of the two effects dominates' (Rillaers, 2001: 427).

Second, high taxes levied on earned income may turn incentives to work and get educated into disincentives to do so (Schettkat, 2003). High taxes, on the one hand, lower the incentive to work and invest, consequently affecting wage levels (Bertola, 1993; Persson and Tabellini, 1994), while, on the other, allow for greater expenditure on welfare and on basic capital investments, such as public education programmes, which may yield greater growth down the line (Aghion and Bolton, 1990; Saint-Paul and Verdier, 1993). There is also a positive association between tax and income inequality levels which creates a trade-off between the incentive to invest (which is the fundamental mechanism of a *laissez-faire* economy) and the expenditure on public education programmes (which reflects a fundamental government policy) (Rodríguez-Pose and Tselios, 2010c: 351).

Persistent high unemployment is a third important rigidity affecting the incentives to work and get educated. Institutional rigidities at the root of European unemployment distort the wage structure and incentives to work. Mass unemployment limits welfare state capacity from two sides: fewer taxes and contributions are paid, and more benefits are claimed (Leibfried, 2000: 57). Differences across European countries in unemployment and unemployment relief payments abound. Unemployment has traditionally been higher in Southern Europe and lowest in Social-Democratic and Liberal welfare regimes.

Differences in family policies

Families are important providers of care and different family structures and care cultures act as independent incentive structures that impinge on women's labour market participation and fertility patterns (Bettio and Plantenga, 2004: 85). Family policies represent an attempt by the state to provide support and care to families in

different stages of life and in difficult situations. However, family policies differ systematically across welfare state regimes, with some authors making a division between a Scandinavian model of public services, on the one hand, and a Southern European family care model, on the other (Anttoneen and Sipilä, 1996; Esping-Andersen, 1999; Bettio and Plantenga, 2004).

First, welfare states vary in the extent to which they support families in the duties of care for children, the elderly and other vulnerable groups. Countries with Residual welfare regimes have traditionally relied on informal care systems within the family, which still tend to persist given the relative cohesion and importance that the family retains in these countries. In Social-democratic welfare regimes, by contrast, informal arrangements are rarer and care processes are generally covered within the welfare system. In general terms, it can be said that intergenerational sharing of care and the gender gap in care provisioning are higher where family cohesion is stronger, as is the case in Southern welfare regimes, and lower where cohesion is weaker as it is in Nordic countries. Second, welfare states also differ in the extent to which they rely on formal care services such as provisions concerning working conditions (i.e. parental leave, career breaks), monetary benefits (i.e. family allowances, social security), and benefits or services provided in kind (i.e. home care services for older people, nursery places for small children). Southern European countries have the lowest levels of income support, the lowest residential and community services for elderly people and, apart from Italy, the lowest public spending on pensions, while the Social-democratic Scandinavian welfare states have the highest proportion of young children in formal child-care arrangements (Bettio and Plantenga, 2004: 85).

Differences in family policies also matter for differences in wage and education, since eligibility and benefit levels under some welfare state programs are based on household earned and unearned income, not just individual household members (Huffman and Kilkenny, 2007).

Differences in educational and employment policies

Educational attainment and labour markets outcomes are strongly connected. A substantial part of welfare state transfers increasingly consist of in-kind benefits (i.e. education), which together with the cash transfers (income) help reduce inequalities in

standards of living (Garfinkel *et al.*, 2006). However, the placement of education within the welfare system is far from clear. Within Europe differences abound. In Anglo-Saxon countries, for instance, educational policy is increasingly considered as an integral part of social policy. The UK welfare state reform is "more concerned with human capital development and invest(s) much more in education than in social security policy, where Germany is strong. In contrast, the countries of the Scandinavian world invest heavily both in social security and education policy" (Allmendinger and Leibfried, 2003: 64). Both Liberal and Social-democratic welfare regimes have done more strides towards integrating education and training in welfare policies than Corporatist and Residual welfare regimes (Taylor-Gooby, 2008).

Human capital has also become key in the increasing transformation of social policy from social provision to social investment (Taylor-Gooby, 2008: 4). According to Taylor-Gooby (2008), the key feature of the 'new' social policy is to consider welfare "as social investment rather than as simple a burden on productive sectors of the economy" (p.5).

One of the main aims of the welfare state is to foster labour participation which plays a pivotal role in addressing internal and external challenges. 'If the share of the employed population increases, the complementarity share of welfare beneficiaries shrinks, thus decreasing social expenditures and the number of people who are at risk of poverty and social exclusion. Moreover, higher employment means more production and, consequently, a higher gross domestic product, which broadens the tax base for the welfare state' (de Beer, 2007: 375). This implies a trade-off between employment growth and generous egalitarian social protection which is not faced with equal emphasis by all kinds of welfare regimes. In the 1980s, for instance, Corporatist welfare regimes relied heavily on reducing the labour supply by inducing early retirement and discouraging women from entering the labour market; Liberal welfare states created new jobs and raised the overall employment rate, but were confronted with growing income dispersion and rising poverty rates; and social democratic welfare states maintained high employment rates and high social protection standards, but came under heavy fire as economic growth stagnated (de Beer, 2007: 377).

It should be noted here that there are complementarities of the above mechanisms such as the complementarities between investment in education (skill formation and

creation), labour force participation (skill utilization), and retirement (skill depreciation) (Jacobs, 2009: 255). This implies that incentives to participate in the labour market and to supply labour (skill utilization), and to retire later (skill depreciation) improve with higher levels of education (skill formation and creation) (Jacobs, 2009: 255).

Differences in social norms

Social norms, which are 'shared by other people and partly sustained by their approval or disapproval' (Elster, 1989: 99) are relevant for the effectiveness of the welfare state (Heinemann, 2008). Heinemann (2008) argues that social norms are determined by a mix of people- and place-based characteristics and can provide important incentives and disincentives to get an education and work. For instance, 'generous support systems for unemployed are less costly if people feel obliged to care for themselves or attach a 'stigma' to claiming benefits' (Heinemann, 2008: 237). Mores about single parenthood or marriage, welfare stigma and work ethics are likely to influence and determine the number of welfare claimants. Moreover, social norms related to the use of social benefits may affect the tendency to apply for social assistance or for early retirement, and the level of reservation wages (Lindbeck, 1995). Thus persistent social norms are an independent and important cause of wage rigidity (Agell, 1999).

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Overall, the welfare state differences in inequalities, in social policies, in labour market rigidities and in regional unemployment, in family policies, in educational and employment policies and in social norms shape differences in people- and place-based effects and, more specifically, differences in individual-, household- and place-based wage and education effects through the creation of incentives and disincentives to work and get educated. These incentives in turn make a difference for levels of wage and education.

3. Econometric specifications and variables

3.1 Hypotheses and econometric specifications

In order to test whether people- and place-based determinants of individual earnings and educational attainment differ across welfare regimes in the EU, and whether these factors play a role in the presence or absence of such differences, we propose a series of econometric specifications including not only individual variables, but also household-level and regional-level variables as explanatory variables. These specifications will allow us to examine the influence of household and regional externalities in wages and education on individual earnings and educational endowment.

The specifications are based on two basic hypotheses derived from the theoretical discussion presented in the previous section

Hypothesis 1: Differences in welfare regimes, once people- and place-based effects are controlled for, make a difference for wages

In order to test this hypothesis, we propose a Mincerian specification which includes (a) the educational attainment of the individual, (b) the logarithm of wage and the educational attainment of the other members of the household where an individual lives, (c) the logarithm of per capita wage and educational endowment of the region where s/he lives, and (d) the wage and educational inequality of the region where s/he lives. The appropriate econometric treatment of welfare regime effects is partly achieved by the use of dummies and interaction terms. More specifically, in order to illustrate and test the differences in individual earnings among the welfare regimes, we resort to the use of dummies; to illustrate and test the differences of the explanatory variables among the welfare regimes, we use interaction terms. In the model, the wages of an individual are determined according to the following equation:

$$\begin{aligned}\log w_{it} = {} & \beta_1 D_{\lambda i} + \beta_2 D_{\lambda i} educ_{it} + \beta_3 D_{\lambda i} \log hw_{it} + \beta_4 D_{\lambda i} heduc_{it} + \beta_5 D_{\lambda i} \log rw_{st} + \\ & + \beta_6 D_{\lambda i} reduc_{st} + \beta_7 D_{\lambda i} wineq_{st} + \beta_8 D_{\lambda i} educineq_{st} + \beta_9 D_{\lambda i} \exp_{it} + \\ & + \beta_{10} D_{\lambda i} \exp_{it}^2 + \beta_{11} D_{\lambda i} gender_{it} + \gamma_1 x_{it} + \gamma_2 y_{it} + \gamma_3 z_{st} + \upsilon_i + \varphi_t + \varepsilon_{it}\end{aligned} \quad (1)$$

Hypothesis 2: Differences in welfare regimes, once people- and place-based effects are controlled for, also make a difference for levels of educational attainment

To test this hypothesis, we propose an empirical specification which includes (a) the logarithm of wage and the educational attainment of the other members of the household where a person lives, (b) the logarithm of per capita wage and educational endowment of the region where s/he lives, and (c) the wage and educational inequality of the region where s/he lives. Once more, the appropriate econometric treatment of welfare regime effects is partly achieved by the use of dummies and interaction terms. In the model, individual educational attainment is determined according to the following equation:

$$\begin{aligned} educ_{it} = {} & \delta_1 D_{\lambda i} + \delta_2 D_{\lambda i} \log hw_{it} + \delta_3 D_{\lambda i} heduc_{it} + \delta_4 D_{\lambda i} \log rw_{st} + \delta_5 D_{\lambda i} reduc_{st} + \\ & + \delta_6 D_{\lambda i} wineq_{st} + \delta_7 D_{\lambda i} educineq_{st} + \delta_8 D_{\lambda i} gender_{it} + \zeta_1 x_{it} + \zeta_2 y_{it} + \\ & + \zeta_3 z_{st} + \upsilon_i + \varphi_t + \varepsilon_{it} \end{aligned} \qquad (2)$$

where, looking at both equations, $\log w_{it}$ is the logarithm wage of individual i at time t; $educ_{it}$ is a measure of the educational attainment of individual i at time t; $\log hw_{it}$ is the logarithm wage of the other household members for individual i at time t; $heduc_{it}$ is the average educational attainment of the other household members for individual i at time t; $\log rw_{st}$ is the logarithm of the per capita wage of region s at time t; $reduc_{st}$ is the educational endowment of region s at time t; $wineq_{st}$ is the wage inequality of region s at time t; and $educineq_{st}$ is the educational inequality of region s at time t. $D_{\lambda i}$ is a vector of dummy variables for welfare regimes with λ denoting categories ($\lambda = 1,2,3,4$). Category D_{1i}, representing the Corporatist welfare state, is taken as the base category. Comparisons are made relative to this base category. $\exp_{it}$ is a labour market experience measure and is included as a quadratic term in equation (1) in order to capture a potential concavity of the experience/earnings profile (Mincer, 1974; Harmon *et al.*, 2003); and $gender_{it}$ is a dummy variable for gender. Finally, u_i depicts the unobserved time-invariant characteristics of individual i (such as innate ability), φ_t represents time-dummies, and ε_{it} is the disturbance term. We define the composite error term as $v_{it} = u_i + \varepsilon_{it}$.

The vector coefficient β_1 (or δ_1) captures the differences in individual earnings – in model (1) – and educational attainment – in model (2) – across the different welfare

regimes considered. The vector coefficients of the interaction terms capture the differences in explanatory variables among welfare regimes: the vector coefficient β_2 represents the differences in internal (private) returns to education; β_3, β_5 and β_7 (δ_2, δ_4 and δ_6 in model (2)) represent the differences in external returns to wages and capture the differences in household- and place-based wage externalities; and β_4, β_6 and β_8 (δ_3, δ_5 and δ_7 in model (2)) represent the differences in external returns to education and capture the differences in household- and place-based education externalities. A significant vector coefficient of the average wage of the other household members, of the regional per capita wage, or of the regional wage inequality will in all likelihood signal the presence of external effects influencing individual wages, while a significant vector coefficient of the average educational attainment of the other household members, of the regional education endowment, or of the regional educational inequality will do the same with educational attainment. However, as discussed in Rodríguez-Pose and Tselios (2010a), these effects may not reflect 'true' wage and educational externalities. Instead any significant coefficients may be just a consequence of household- and regional-specific features which may be correlated with wages or educational attainment at a household and regional level, respectively (Rudd, 2000). In order to minimise this potential risk, we include a vector of additional people-based (individual-specific x_{it} and household- (and individual-) specific y_{it}) and place-based (regional-specific z_{st}) characteristics. γ_1, γ_2 and γ_3 in model (1) and ζ_1, ζ_2 and ζ_3 in model (2) are the coefficients of those specific characteristics. This set of control variables allow us to capture relevant structural individual, household, and regional features, while simultaneously addressing sources of heterogeneity (Rodríguez-Pose and Tselios, 2010a).

3.2 Data, variables and estimators

Data

The paper relies on the ECHP data survey for the majority of its empirical data. The ECHP contains information of more than 100,000 individuals, interviewed about their socioeconomic status at regular one-year intervals between 1994-2001. All cases reporting errors or missing values in wages, educational attainment, work experience

and gender were removed from the dataset. The resulting panel includes 417,594 individuals living in 96 regions (NUTS 0, I or II level) of the EU. 40.26 percent of those included in our panel sample live in what have been defined (Esping-Andersen, 1990) as Corporatist welfare regimes, 13.60 percent in Liberal regimes, 34.25 percent in Residual regimes, and the remaining 11.89 percent in Social-democratic regimes. 86.52 percent of those considered are normally working individuals (15+ hours/week), while 4.85 percent, 8.35 percent, and 0.28 percent are unemployed, inactive, and non-respondents, respectively. Finally, 272,306 individuals (65.21 percent of our sample: 66.08 percent for Corporatist, 67.66 percent for Liberal, 61.23 percent for Residual, and 70.90 percent for Social-democratic welfare regimes) share a house with at least one other member. Men constitute 56.10 percent of the sample. We use women as the base category for our specifications.

The ECHP data survey is complemented with macroeconomic data extracted from the Eurostat's Regio dataset which consists of repeated observations on individual regions (NUTS) of the EU. The descriptive statistics of our main variables are presented in Appendix 1.

Variables

The two dependent variables in the paper, the annual earnings of an individual and his/her level of educational attainment, are extracted from the variables '*wage and salary earnings*' and '*highest level of general or higher education completed*' of the ECHP respectively. In the educational attainment variable workers are classified according to three educational categories: recognised third level education completed, second stage of secondary level education completed, and less than second stage of secondary level education completed. This classification is, however, not problem free: (a) it assumes that any increment in education level completed at primary or secondary level adds a constant quantity to human capital stock, but that this is not the case at postgraduate level, and (b) it disregards the fact that education systems and structures of each country vary in terms of resources, duration, and the preparation of students (Psacharopoulos and Arriagada, 1986; Ram, 1990; Sianesi and Van Reenen, 2003; Rodríguez-Pose and Vilalta-Bufí, 2005; Rodríguez-Pose and Tselios, 2011). Following the work by Rodríguez-Pose and Tselios (2010b; 2010a), we address the problems linked to the cross-country comparability by normalising all the educational

variables by the national average. This has the additional advantage of making the normalised estimated coefficients directly comparable.

Labour market experience is proxied by potential experience and calculated as the age of an individual minus the age at which the individual left formal education (Harmon *et al.*, 2003). This is not a strict measure of work experience, which is typically recorded as the weighted sum of the number of years of part-time and full-time work since leaving full time education.

We use a series of people- and place-based control variables extracted from the ECHP data survey and the Eurostat's Regio dataset. Individual-based controls include the sector in which the individual is employed, the type of job performed, and her/his health (source: ECHP). Household-based controls comprise household size, number of adults in the household, and household type (source: ECHP). Finally, regional-based controls include the sectoral specialisation of the region, regional innovation, rail and road infrastructure, and population density (source: Eurostat Regio).

Estimators

We estimate our econometric specifications using random effects estimators, as in Green et al. (2007) and Rodríguez-Pose and Tselios (2010b; 2010a). The reasons behind the choice of random effects are multiple. First, the use of fixed effects estimators precludes analysing the impact of gender, as this is a time-invariant characteristic, and may simultaneously wipe out the impact of individual attainment and earnings as the level of education of a worker rarely changes in adulthood. Second although random effects estimations have the drawback of assuming that the u_i are uncorrelated with all explanatory variables across all time periods, we have to treat the u_i as random as our observations are randomly drawn from a large population (Wooldridge, 2002). Third, as ν_{it} are serially correlated across time, the random effects estimator solves the serial correlation problem related to having a very large N and relatively small T. Finally, random effects coefficients can be interpreted as long-run effects, as cross-sectional differences are retained (Griliches and Mairesse, 1984; Mairesse, 1990; Durlauf and Quah, 1999; Rodríguez-Pose and Tselios, 2010b).

4. Empirical results

4.1 Testing whether differences in welfare regimes make a difference for wages

Do differences in welfare regimes make a difference for wages across the regions of Europe? In order to answer this question the empirical strategy adopted in the analysis is straightforward. We estimate a series of regressions including the relationship of welfare regime dummies, the level of education of the worker, the wage and schooling of the other members of the household, the regional wage per capita and regional educational endowment, and the regional wage and educational inequality, with the wages of the individuals included in the analysis across the four welfare regimes being considered. The results are reported in Table 1.

Insert Table 1 around here

The results in Table 1 highlight that a number of factors affecting the wages of an individual are common to all welfare regimes included in the analysis. As expected, the level of education of an individual matters for her earning prospects. The higher the level of education, the higher the expected wages. Across all four welfare regimes education acts as a label, as well as a discriminating device, which can be effectively used in the labour market, increasing the opportunities of an individual to find a better job. It also has a positive effect on productivity, allowing him/her to command higher wages.

The different types of household externalities included in the analysis also seem to matter for wages. Living in a well-off household is generally conducive to higher wages, once other factors have been controlled for. Household education externalities are also positively associated with wages in all welfare regimes. The positive coefficient is likely to indicate that the education of one individual can bring pecuniary benefits for other members of the household. In other words, an individual with a relatively low level of education living in a highly educated household is likely to see his or her earning potential increase, because the highly educated members of the household may help drive up aspirations and help provide better occupational opportunities (Rodríguez-Pose and Tselios, 2010b).

Place-based effects also have an influence on individual wages. Regional wage per capita is positively associated with individual wages, supporting the idea that spillovers among individuals living in the same place generate pecuniary benefits for workers. Consequently, the higher the economic development of a region, the higher the probability that an individual will increase his/her productivity by interacting with others within the region. In other words, individuals living in wealthier regions will be more productive than similarly qualified individuals in poor regions. The regional educational attainment, by contrast, seems to have a negative effect on individual wages. This implies that workers living in regions with a good endowment of human capital, measured by the level of education of the working force, do not command higher wages. In any case, the significance and sign of these coefficients are highly sensitive to the inclusion of the regional wage per capita variable. Hence, across the board, regional wage per capita is far more relevant than regional educational endowment, implying that intraregional wage interactions are stronger than intraregional education interactions (Table 1). Regional wage inequality is negatively associated with individual wages in all welfare regimes. A person living in a region with low wage inequality tends to have higher wages than an individual sharing similar characteristics but living in a less egalitarian region. Hence, wage inequalities do not provide good for incentives to work.

Finally, the work experience and gender variables introduced in the model have the expected coefficients. Work experience is positively associated with wages, although there is an inverted-U relationship between work experience and individual earnings across all welfare regimes, pointing to the fact that the positive effect of experience on wages wanes and may even decline as experience increases (Table 1). And there are clear signs of gender discrimination: all other things being equal, men tend to earn significantly more than women, confirming the gender discrimination in the labour market especially in the Corporatist and Liberal regimes.

These general trends of the factors which influence earnings hide, however, considerable differences across welfare regimes in Europe. The pecuniary returns to education, for example, vary significantly between Residual welfare regimes and the three other welfare regimes considered. When looking at the coefficients of the complete model, the pecuniary returns to education for someone living in a region

with a Residual welfare system are 43 percent higher than for someone living under a Liberal regime and 21 percent higher than in a socio-democratic region (Table 1, Regression 3). This gap is robust to the inclusion of household- and regional-based wage and education effects. These results signal that in areas where the state safety net is weaker, individuals are aware that they have to rely more on alternative sources of insurance and welfare and that education may be one of the means of providing that insurance.

The household-based wage and education effects also vary significantly across welfare regimes. While the association between household wage externalities and the wages of an individual is positive in Liberal, Residual and Social-democratic welfare regimes, in Corporatist welfare regimes, this coefficient is negative and statistically significant. Such a result may hide a potential – often gender-based – division of tasks within a household. In cases of low intra-household wage inequalities, there will be a tendency in Corporatist welfare environments for one of the members of the family – and fundamentally women – to sacrifice earnings and career prospects for the sake of the family. This result chimes with the tendency in Corporatist welfare settings to implement measures aimed at encouraging mothers to stay at home, creating disincentives to work and future distortions in the labour market. The dimension of the coefficient on both wage and education of the other members of the household is higher for regions in Southern Europe. This is an indication that wage and education interactions within the household, through mechanisms such as the provision of information, encouragement and even contacts, are stronger in Residual regimes and a sign of the prominent role of the family as a provider of not only welfare services, but also of employment information and opportunities in cases of weak presence of the state.

Place-based effects on wages tend to be higher in socio-democratic welfare regimes. When all wage and education effects are included, the coefficient on wage inequality for the Social-democratic regimes is significantly higher than for the Corporatist, Liberal and Residual regimes (Table 1).[2] Such a result sanctions the effort made by Scandinavian countries in order to try to reduce income inequality (Garfinkel *et al.*,

[2] This result is robust to the definition of economic inequality as the coefficients on regional wage inequality and on regional income inequality are cut by the same cloth. The results can be provided upon authors' request.

2006), effectively pushing individuals off welfare and into the labour force. Regional education inequality, by contrast, has a negative association with wages for an individual living in a Corporatist welfare regime, positive for someone living in a Liberal setting and insignificant in Residual welfare regimes (Table 1). Labour markets in Corporatist and Liberal welfare regimes tend to discriminate more against women in the labour place than in Social-democratic and even Residual welfare regimes.

Sensitivity of the results

In order to test the robustness of the above results, several people- and place-based variables are added to the model. We control for these characteristics in order to assess whether the observed wage and education effects on earnings reflect 'true' effects. The results of the analysis are presented in Table 2.

Insert Table 2 around here

After controlling for the sector of employment of the individual, the type of job performed, the health of the individual, the household size, the number of adults living in the household, the different types of households, the sectoral specialisation of the region, the regional innovation, the road and rail infrastructure and the population density, the results presented are robust to the introduction of these controls[3]. The controls also display some interesting results: (a) industrial workers earn marginally higher wages than service workers, and both higher than agricultural workers; (b) individuals employed in the public sector earn more than those in the private sector; (c) legislators, senior officials and managers, professional, and technicians tend to have the highest earnings, while agricultural and fishery workers the lowest; (d) individuals with poor health have the lowest earnings; (e) the earnings of individuals decrease with household size; (f) the greater of the number of adults living in the household the greater the earnings; (g) couples without children (both persons aged less than 65) have the highest earnings; (h) workers in regions

[3] These results, however, need to be considered with caution, as the number of observations drop significantly with the inclusion of all the controls together in the analysis. The introduction of a more limited number of controls raises back the number of observations close to that reported in Table 1 and always confirm the robustness of the results. These regressions can be provided upon request.

specialised in services or in industry earn, as a general rule, more than those living in regions with a larger primary sector; (i) road infrastructure has a positive impact on individual earnings, while rail infrastructure has a negative impact; and (j) population density is marginally, but negatively and significantly, associated with wages.

4.2 Testing whether differences in welfare regimes make a difference for levels of education

We follow the same empirical strategy for the determinants of the educational attainment of an individual. As in the case of the determinants of wages, there are common factors for all four welfare regimes, as well as significant differences, although, in the case of educational attainment, the differences seem to be larger than the similarities. The results are reported in Table 3.

Insert Table 3 around here

Starting with the similarities, household and family environments provide incentives to acquire education across the board. People living in a household with a high educational attainment are more prone to increase their level of schooling than equally talented individuals living in a less auspicious educational environment (Sianesi and Van Reenen, 2003: 160). The positive and significant coefficients point in that direction signalling that household education externalities matter regardless of the dominant welfare regime (Table 2) as the coefficients on educational attainment of the other members of the household are positive and statistically significant for all regimes.

The educational attainment of individuals is also affected by place-based effects. The impact is however opposite to that emerging from Table 1: regional wages per capita are negatively associated with an individuals' education – although the negative effects are higher for workers living in Corporatist or Residual welfare environments – while educational endowment has a positive impact on education of individuals, with coefficients across welfare regimes whose difference hardly exceeds 10 percent. We can thus consider the human capital of a region as a public good which acts as a magnifier of the education of individuals. As a consequence, the higher the educational endowment of a region, the higher the probability that an individual will

increase his/her knowledge by interacting with others within the region (Jovanovic and Rob, 1989).

Welfare regimes, however, seem to significantly shape the incentives to get an education for an individual, as the differences across regimes are greater than the similarities. One of the key differences is that in Liberal and, especially, in Residual welfare regimes individuals living in better-off households have a greater incentive to get educated, as reflected by the positive coefficients of the wage of other members of the household (Table 3). The same coefficients are negative for Corporatist and Social-democratic regimes, albeit non-significant in the latter. Household educational externalities are higher in Residual welfare regimes and lower in Liberal ones. Hence, both wage and education externalities are stronger for people living in a Southern country, meaning that wage and educational attainment of the other members of a household in Residual regimes shape the educational and occupational aspirations of the individual to a greater than in other welfare regimes.

There are also considerable differences in how regional inequality levels across welfare regimes affect educational attainment levels. Regional wage inequality is positively associated with educational attainment in Residual, Corporatist and, above all, Social-democratic regimes. It seems that, in the case of the highly equal environments of Scandinavia, the presence of moderate wage inequalities in particular regions provide an additional incentive to get educated and stand out in the crowd. The effect of regional educational inequality on educational attainment is different across regimes: positive and robust in Corporatist, positive but non-robust impact in Liberal regimes, and negative and robust in Residual regimes (Table 3).

Finally, once other factors are controlled for, men have the highest average educational attainment level in Corporatist and Liberal regimes and the lowest in the two extremes: Residual and Social-democratic regimes.

Sensitivity of the results

In order to test the robustness of the above results, we control for additional people- and place-based effects. The results of the analysis which are presented in Table 4 are robust to the inclusion of these effects. Table 4 also shows that educational attainment

is highest for workers employed in the service sector, for those in public service, for professionals, for workers with very good heath, for couples with a maximum of one or two children, and for workers living in regions specialised in services, in innovative regions and in regions with good rail infrastructure (Table 4).

Insert Table 4 around here

5. Conclusions

The role of institutions in shaping economic incentives and outcomes has become all too evident for economists and other social scientists in recent years (e.g. Rodrik, 2007). This paper has sought to contribute to our knowledge about how institutions shape wages and education by looking at perhaps the most powerful of formal institutions, the state, through the lens of the analysis of its most prominent area of budgetary intervention: social and welfare policy. Our analysis has sought to find whether differences in welfare regimes across countries of Europe have an impact on the wealth and educational attainment of the individuals living in its regions. In other words, whether different welfare and social policy systems generate different incentives for and individual to get educated and work. In order to do that we have resorted to a microeconomic approach as a means of assessing whether differences in inequalities, in social policies, in labour market rigidities and in regional unemployment, in family policies, in education and employment policies and in social norms affect the earnings potential and educational achievement of individuals. Individual-, household- and place-based characteristics are controlled for in order to determine which are the vehicles through which different welfare regimes channel their incentives to work and get educated.

The results clearly indicate that welfare regimes in Europe make a substantial difference for education and earnings. While there are a number of characteristics that are constant in shaping wages and educational attainment across European regions – better educated individuals, living in better-off households and in richer and more egalitarian regions tend to earn more and, in most cases, be better educated – the effects of different welfare regimes on wages and educational attainment are stark. These differences are greatest for the two welfare regimes at the two ends of the spectrum: the Nordic Social-Democratic welfare regime, on the one hand, and the

Residual, Mediterranean or Southern, on the other. As could be expected, in Social-Democratic regimes the environment (place-based effects) matter the most. Individuals do not have to rely on families as the state effectively provides care, income support and job opportunities. Even individual characteristics, while still important, are less relevant. In contrast, in Residual welfare regimes, the weaker – in relative terms – provision of effective social and welfare policies, leave the family, in what are still more cohesive societies, as a key provider of care, income support and even job information and opportunities. Individuals are aware of this and differences in individual characteristics (and basically in levels of educational attainment) become a substitute system of insurance in the face of a less effective welfare state.

In between the Corporatist and Liberal welfare regimes also provide differential incentives and disincentives to work and get educated. In Corporatist regimes, the welfare state may be leading to greater income polarization by encouraging mothers to stay out of the labour force while their children are young. The Liberal welfare state may also be generating greater inequality, while, at the same time, creating more incentives to get educated.

These results have important policy implications because the structure, cost and future of the welfare state is a major political issue in most Western countries (Hamnett, 2009). Faced with the internal challenges associated with an ageing population, increasingly precarious types of employment and a more unstable family and with the external challenges associated with the increased competitive global economy, the European welfare regimes need to consider and adopt innovative policies in order to achieve a better balance between the need to expand social care and the imperative to curb public spending (Pavolini and Ranci, 2008) through the design of welfare systems incentives which maximize the incentives to work and get educated. Learning from the strengths and shortcomings of existing welfare regimes in this respect represents a crucial step in designing more effective and efficient social and welfare policies and in trying to offer better solutions to the age-old conundrum of balancing economic efficiency and social justice.

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Table 1: Determinants of the earnings of an individual across welfare regimes

Dep. variable	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Wages of an individual	**Corporatist**			**Liberal**			**Residual**			**Social-democratic**		
Welfare regime	base	base	base	-1.6893	0.5136	-0.6425	-1.7696	0.9078	1.7114	-0.9398	0.0024	1.4865
dummies				(0.0551)***	(0.1960)***	(0.2696)**	(0.0449)***	(0.1856)***	(0.2437)***	(0.0550)***	(0.2936)	(0.3580)***
Educational attainment	0.1091	0.1024	0.1149	0.1112	0.1027	0.1051	0.1385	0.1681	0.1505	0.1196	0.1155	0.1243
of individual	(0.0034)***	(0.0027)***	(0.0033)***	(0.0059)***	(0.0048)***	(0.0057)***	(0.0045)***	(0.0034)***	(0.0044)***	(0.0062)***	(0.0051)***	(0.0060)***
Log of wage of the	0.0260		-0.0076	0.1705		0.0256	0.1771		0.0701	0.0977		0.0637
other members of the	(0.0031)***		(0.0030)**	(0.0046)***		(0.0048)***	(0.0034)***		(0.0035)***	(0.0043)***		(0.0042)***
household												
Educational attainment	0.0033		0.0121	0.0053		0.0178	0.0519		0.0647	-0.0058		0.0047
of the other members	(0.0031)		(0.0030)***	(0.0052)		(0.0050)***	(0.0040)***		(0.0039)***	(0.0055)		(0.0054)
of the household												
Log of wage per capita		1.2699	1.2580		1.2125	1.2653		1.2104	1.0191		1.2338	1.0317
of region		(0.0172)***	(0.0209)***		(0.0115)***	(0.0190)***		(0.0096)***	(0.0162)***		(0.0254)***	(0.0306)***
Educational		-0.0232	-0.0198		-0.0214	-0.0316		-0.0261	-0.0277			
endowment of region		(0.0043)***	(0.0050)***		(0.0056)***	(0.0068)***		(0.0037)***	(0.0046)***			
Wage inequality within			-1.7484			-1.0913			-1.5191			-2.2981
region			(0.0946)***			(0.1341)***			(0.0930)***			(0.1121)***
Educational inequality			-0.1002			0.2092			-0.0086			
within region			(0.0074)***			(0.0325)***			(0.0765)			
Work experience	0.0770	0.0759	0.0747	0.1014	0.0906	0.0913	0.0854	0.0692	0.0705	0.1295	0.1262	0.1265
	(0.0011)***	(0.0009)***	(0.0011)***	(0.0017)***	(0.0014)***	(0.0017)***	(0.0010)***	(0.0008)***	(0.0010)***	(0.0020)***	(0.0016)***	(0.0019)***
Work experience	-0.0014	-0.0015	-0.0015	-0.0018	-0.0018	-0.0019	-0.0016	-0.0014	-0.0014	-0.0025	-0.0026	-0.0026
squared	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Male	0.6141	0.5688	0.6063	0.6462	0.5631	0.6048	0.3757	0.3370	0.3773	0.3075	0.2613	0.3106
	(0.0108)***	(0.0094)***	(0.0104)***	(0.0177)***	(0.0157)***	(0.0170)***	(0.0103)***	(0.0085)***	(0.0099)***	(0.0186)***	(0.0168)***	(0.0179)***
Constant	7.9235	-3.9803	-3.1697	7.9235	-3.9803	-3.1697	7.9235	-3.9803	-3.1697	7.9235	-3.9803	-3.1697
	(0.0317)***	(0.1645)***	(0.1953)***	(0.0317)***	(0.1645)***	(0.1953)***	(0.0317)***	(0.1645)***	(0.1953)***	(0.0317)***	(0.1645)***	(0.1953)***
Observations	272306	417594	272306	272306	417594	272306	272306	417594	272306	272306	417594	272306

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2: Determinants of the earnings of an individual: adding control variables

Dep. Variable: Wages of an individual	**Corp.**	**Liberal**	**Residual**	**Social Dem**
Wages of an individual		2.4809	5.6739	6.2484
		(0.7550)***	(0.6225)***	(0.7008)***
Educational attainment of individual	0.0352	0.1096	0.0715	0.0641
	(0.0043)***	(0.0094)***	(0.0088)***	(0.0064)***
Log of wage of the other members of the household	-0.0076	0.0192	0.0347	0.0558
	(0.0048)	(0.0085)**	(0.0079)***	(0.0049)***
Educational attainment of the other members of the household	0.0121	-0.0075	0.0384	0.0123
	(0.0041)***	(0.0082)	(0.0081)***	(0.0057)**
Log of wage per capita of region	1.6436	1.3037	0.9983	0.9276
	(0.0536)***	(0.0627)***	(0.0418)***	(0.0469)***
Educational endowment of region	-0.0909		-0.0112	
	(0.0141)***		(0.0082)	
Wage inequality within region	-0.5798	-0.1084	-0.0511	-1.1783
	(0.3443)*	(0.3758)	(0.2775)	(0.2810)***
Educational inequality within region	-0.0587	0.6499	0.3675	
	(0.0119)***	(0.2191)***	(0.1992)*	
Work experience	0.0563	0.0857	0.0596	0.0956
	(0.0017)***	(0.0029)***	(0.0023)***	(0.0023)***
Work experience squared	-0.0011	-0.0016	-0.0011	-0.0019
	(0.0000)***	(0.0001)***	(0.0001)***	(0.0001)***
Male	0.5136	0.5314	0.2576	0.3086
	(0.0161)***	(0.0269)***	(0.0196)***	(0.0178)***
Industrial sector[1]		0.4481 (0.0235)***		
Service sector		0.3683 (0.0231)***		
Public sector		0.0886 (0.0078)***		
Legislators, senior officials and managers[2]		0.7467 (0.0279)***		
Professionals		0.7404 (0.0277)***		
Technicians and associate professionals		0.6689 (0.0271)***		
Clerks		0.6009 (0.0274)***		
Service workers and shop and market sales workers		0.4645 (0.0275)***		
Craft and related trades workers		0.4883 (0.0275)***		
Plant and machine operators and assemblers		0.5082 (0.0275)***		
Elementary occupations		0.3965 (0.0265)***		
Health: very good[3]		0.0904 (0.0306)***		
Health: good		0.0944 (0.0303)***		
Health: fair		0.0765 (0.0303)**		
Health: bad		0.0539 (0.0323)*		
Household size		-0.0658 (0.0051)***		
Number of adults in the household		0.0339 (0.0052)***		
Couples without children (at least one person aged 65 or more) [4]		0.1500 (0.0534)***		
Couples with one child (child aged less than 16)		-0.0027 (0.0093)		
Couples with two children (all children aged less than 16)		-0.0113 (0.0126)		
Couple with three children or more (all children aged less than 16)		-0.0336 (0.0183)*		
Couple with one or more children (at least one child aged 16 or more)		-0.0621 (0.0112)***		
Gross value added of industry per capita[5]		-0.1071 (0.3747)		
Gross value added of services per capita		0.1973 (0.3927)		
Total intramural R&D expenditure as a % of GDP		0.0029 (0.0124)		
Logarithm of motorways (km) per square kilometer		0.0908 (0.0138)***		
Logarithm of railway lines (km) per square kilometer		-0.1853 (0.0243)***		
Population density		-0.0002 (0.0000)***		
Constant		-8.0605 (0.5543)***		
Observations		70284		

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; [1] Base category: Agricultural sector; [2] Base category: Skilled agricultural and fishery workers; [3] Base category: Health: very bad; [4] Base category: Couples without children (both persons aged less than 65); [5] Base category: Gross value added of agriculture per capita

Table 3: Determinants of the educational attainment of an individual across welfare regimes

Dep. variable Educational attainment of an individual	(1)	(2) **Corporatist**	(3)	(1)	(2) **Liberal**	(3)	(1)	(2) **Residual**	(3)	(1)	(2) **Social-democratic**	(3)
Welfare regime dummies	base	base	base	-0.0392 (0.0446)	-2.7425 (0.1654)***	-1.7840 (0.2321)***	-0.2095 (0.0363)***	-1.3280 (0.1586)***	-0.8619 (0.2130)***	0.0845 (0.0437)*	-1.8240 (0.2378)***	-1.8450 (0.3013)***
Log of wage of the other members of the household	-0.0086 (0.0025)***		-0.0017 (0.0026)	0.0005 (0.0037)		0.0079 (0.0041)*	0.0258 (0.0028)***		0.0477 (0.0030)***	-0.0056 (0.0036)		-0.0006 (0.0036)
Educational attainment of the other members of the household	0.1772 (0.0025)***		0.1711 (0.0025)***	0.1071 (0.0043)***		0.1022 (0.0043)***	0.2201 (0.0033)***		0.2137 (0.0033)***	0.1426 (0.0045)***		0.1402 (0.0045)***
Log of wage per capita of region		-0.3478 (0.0147)***	-0.2617 (0.0182)***		-0.0604 (0.0089)***	-0.0675 (0.0158)***		-0.2116 (0.0078)***	-0.2068 (0.0140)***		-0.1508 (0.0196)***	-0.0812 (0.0245)***
Educational endowment of region		0.0970 (0.0039)***	0.0883 (0.0045)***		0.0845 (0.0048)***	0.0763 (0.0059)***		0.0775 (0.0033)***	0.0688 (0.0042)***			
Wage inequality within region			0.1692 (0.0808)**			-0.1549 (0.1125)			0.2075 (0.0830)**			0.7363 (0.1095)***
Educational inequality within region			0.0717 (0.0061)***			-0.0018 (0.0290)			-0.4033 (0.0704)***			
Male	0.0166 (0.0102)	0.0243 (0.0097)**	0.0207 (0.0102)**	0.0319 (0.0168)*	-0.0082 (0.0162)	0.0346 (0.0168)**	-0.1025 (0.0091)***	-0.1596 (0.0078)***	-0.0946 (0.0090)***	-0.1123 (0.0177)***	-0.1041 (0.0173)***	-0.1111 (0.0176)***
Constant	0.0415 (0.0254)	3.3185 (0.1417)***	2.4177 (0.1714)***	0.0415 (0.0254)	3.3185 (0.1417)***	2.4177 (0.1714)***	0.0415 (0.0254)	3.3185 (0.1417)***	2.4177 (0.1714)***	0.0415 (0.0254)	3.3185 (0.1417)***	2.4177 (0.1714)***
Observations	272306	417594	272306	272306	417594	272306	272306	417594	272306	272306	417594	272306

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 4: Determinants of the educational attainment of an individual: adding control variables

Dep. Variable: Educational attainment of an individual	**Corp.**	**Liberal**	**Residual**	**Social Dem**
Welfare regime dummies		-7.0713	-4.8732	-3.4306
		(0.8933)***	(0.7378)***	(0.8241)***
Log of wage of the other members of the household	0.0150	-0.0030	0.0775	0.0051
	(0.0057)***	(0.0101)	(0.0094)***	(0.0058)
Educational attainment of the other members of the household	0.1700	0.1322	0.2575	0.1530
	(0.0048)***	(0.0096)***	(0.0087)***	(0.0066)***
Log of wage per capita of region	-0.7790	0.0659	-0.2570	-0.3723
	(0.0626)***	(0.0748)	(0.0494)***	(0.0553)***
Educational endowment of region	0.0646		0.0261	
	(0.0166)***		(0.0098)***	
Wage inequality within region	1.2947	0.1679	0.2316	0.5039
	(0.4228)***	(0.4604)	(0.3335)	(0.3195)
Educational inequality within region	0.1976	-0.6034	-0.3918	
	(0.0145)***	(0.2710)**	(0.2307)*	
Male	-0.0367	-0.0409	-0.0706	-0.0493
	(0.0173)**	(0.0288)	(0.0211)***	(0.0192)**
Industrial sector[1]		0.0739 (0.0275)***		
Service sector		0.0951 (0.0271)***		
Public sector		0.0778 (0.0090)***		
Legislators, senior officials and managers[2]		0.5826 (0.0330)***		
Professionals		0.8523 (0.0325)***		
Technicians and associate professionals		0.4958 (0.0320)***		
Clerks		0.3117 (0.0323)***		
Service workers and shop and market sales workers		0.0951 (0.0325)***		
Craft and related trades workers		-0.0207 (0.0325)		
Plant and machine operators and assemblers		-0.0540 (0.0326)*		
Elementary occupations		-0.0870 (0.0314)***		
Health: very good[3]		0.0894 (0.0373)**		
Health: good		0.0658 (0.0371)*		
Health: fair		0.0390 (0.0370)		
Health: bad		0.0023 (0.0395)		
Household size		0.0080 (0.0059)		
Number of adults in the household		0.0000 (0.0061)		
Couples without children (at least one person aged 65 or more) [4]		-0.0868 (0.0628)		
Couples with one child (child aged less than 16)		0.0492 (0.0111)***		
Couples with two children (all children aged less than 16)		0.0417 (0.0148)***		
Couple with three children or more (all children aged less than 16)		0.0266 (0.0216)		
Couple with one or more children (at least one child aged 16 or more)		-0.0243 (0.0130)*		
Gross value added of industry per capita[5]		0.3018 (0.4285)		
Gross value added of services per capita		0.5584 (0.4494)		
Total intramural R&D expenditure as a % of GDP		0.0511 (0.0147)***		
Logarithm of motorways (km) per square kilometer		-0.0569 (0.0155)***		
Logarithm of railway lines (km) per square kilometer		0.1179 (0.0275)***		
Population density		-0.0000 (0.0001)		
Constant		5.8995 (0.6439)***		
Observations		70284		

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; [1] Base category: Agricultural sector; [2] Base category: Skilled agricultural and fishery workers; [3] Base category: Health: very bad; [4] Base category: Couples without children (both persons aged less than 65); [5] Base category: Gross value added of agriculture per capita

Appendix 1: Descriptive statistics of the main variables

Variable	Year	Obs	Mean (Percentage)	Std. Dev.	Min	Max
Log of wage of individual	1994	46392	8.8919	1.0900	-0.0566	12.9665
	2001	48046	9.3564	0.9448	0.5876	12.8021
Educational attainment of individual	1994	46392	-0.0018	0.9937	-1.6413	3.0551
	2001	48046	0.0059	0.9909	-1.8809	7.7891
Log of wage of the other members of the household	1994	29050	8.8874	1.0063	1.7492	12.9665
	2001	32517	9.3347	0.8963	0.5882	12.6477
Educational attainment of the other members of the household	1994	29050	-0.0029	0.9981	-1.6958	3.1233
	2001	32517	-0.0004	1.0021	-2.0552	7.7727
Log of wage per capita of region	1994	46392	9.2046	0.3573	8.3651	9.9781
	2001	48046	9.6089	0.2926	8.8860	10.2493
Educational endowment of region	1994	46392	0.0026	0.8542	-2.4885	2.3973
	2001	48046	-0.0033	0.8496	-2.5938	2.7695
Wage inequality within region (gini coefficient)	1994	46392	0.3591	0.0480	0.2782	0.5325
	2001	48046	0.3547	0.0462	0.2498	0.4569
Educational inequality within region (gini coefficient)	1994	46392	0.3057	0.2239	0.0000	0.6947
	2001	48046	0.1871	0.1927	0.0000	0.6060
Work experience of individual	1994	46392	19.7874	12.6006	0	73
	2001	48046	19.7078	12.9929	0	74
Percentage of male	1994	46392	0.5862			
	2001	48046	0.5412