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# Social Capital and the Labour Market

The extent to which differences in labour market performance can be explained by differences in social capital in European regions


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HÁSKÓLI ÍSLANDS

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This thesis is a 12 ETCS final project for a B.S. degree at the Faculty of Economics, School of Social Sciences, University of Iceland

# Preface

This thesis is a 12 ETCS final project for a B.S. degree at the Faculty of Economics at the University of Iceland. It is a by-product of my work as a research assistant to my advisor Professor Gylfi Zoega. I'm forever grateful for his guidance and encouragement during my studies. I further wish to recognize the knowledge Professor Þórólfur Þórlindsson has shared with me during my work on this thesis. His insight into sociological theory has proven most helpful and of great importance. I've had the good fortune off extremely supporting parents, Arnór and Helga. This work is dedicated to them and my young daughter, Freyja. I hope I can make them proud.

# Abstract

In this thesis the extent to which differences in labour market performance in European regions can be traced to differences in social capital are explored. Social capital can be thought of as everything that facilitates collective or individual action, such as values and effective norms.

The link between values, as a form of social capital and labour market outcomes, can be described using commonly used economic models since employer-employee relations are of the principal-agent kind. Thus, in a model of Shapiro and Stiglitz from 1984, the relationship between an employer and an employee is described by a principal agent problem. The employer would like a worker to work hard but the latter has an incentive to shirk his/her duties but is restrained from doing so by a combination of monitoring the risk of unemployment and other offsetting incentives, which may serve as disciplinary devices. Workers' background – their values and attitudes towards achieving on the job to take the initiative and the values instilled in them by parents as children – will affect the utility they get from shirking their duties.

When workers enjoy shirking their duties the employer may be forced to establish a non-shirking condition to alter their expected lifetime utility in a way that the employee is better off not shirking. The consequences of establishing the non-shirking condition are higher critical wages. By analysing a steady state equilibrium, the authors illustrated that no shirking is inconsistent with full employment, which eventually translates into involuntary unemployment. It is therefore worthwhile to examine if the level of social capital is related to the level of unemployment and which sets of values contribute to social capital.

Using canonical-correlation analysis the findings of this study demonstrate a significant difference in social capital between European regions. Teaching children to be independent, imaginative and tolerant contributes positively to social capital as does a higher level of trust towards fellow citizens. These differences can account for differences in unemployment, male labour force participation and average hours of work across regions. In particular, regional differences in unemployment that mirror differences in social capital dwarf differences in average levels of unemployment across countries, which are the focus of most studies on unemployment.

# Table of Contents

# List of Figures

# List of Tables

# 1 Introduction

The aim of this thesis is to explore the extent to which differences in labour market performance in European regions can be traced to differences in social capital. Social capital is an ill-defined concept but can, for the sake of simplicity, be thought of as everything that facilitates collective or individual action (Foley & Edwards, 1997). Unemployment varies greatly between countries in Europe as well as between regions within countries. In the following analysis regions are classified using the *Nomenclature of territorial units for statistics (NUTS)* classification, developed and regulated by Eurostat. In 2003 there were 68 regions with unemployment rates below 5 percent while 15 regions had unemployment above 25 percent. The countries having the low unemployment regions in 2003 included mainly north and central European countries in addition to northern Italy and Cyprus. The highest unemployment rates were found in southern Italy and some eastern European regions. Variation in unemployment is therefore not confined to differences across countries; differences within countries are no less significant.[1]

The research question addressed in this thesis is to what extent differences in social capital can explain differences in labour market outcomes in European regions. We assembled measures from the European Values Study (2011) on values, which might be regarded as social capital, and may affect workers' performance and behaviour on the job. These include the level of trust towards fellow citizens; how people value the importance of work; whether they value job security, being able to take the initiative and having the opportunity to achieve on the job; and which attitudes parents would like to instil in children – such as obedience, independence, hard work, imagination, tolerance, self-determination and responsibility. In all, there are 12 variables for each of Europe's NUTS 2 regions.[2] Labour market performance is then made to depend on the rate of

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[1] Unemployment was 18.1 percent in Andalusia as opposed to 9.4 percent in on the Balearic Islands and while unemployment was on average quite high in Germany in 2003, unemployment in Trier was only 4.8 percent while in Mecklenburg-Vorpommern it was 20 percent and also in excess of 15 percent in other formerly East German regions.

[2] NUTS is a hierarchical system that divides up the economic territories in the European Union in to three subdivisions, which are based on the existing national administrative classifications. In this analysis we make use of the NUTS 2 standard is it applies to the application of regional policies (Your key to European statistics, n.d.).

unemployment in each region, the rate of male labour force participation and average hours worked. They were chosen with regard to availability, variety and credibility of the data. It is worth mentioning that the selection of data for region level is quite limited compared to aggregate numbers. [3]

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[3] For instance, female labour participation rate was missing for several regions and the total labour participation was believed to inconsistent in that regard. Therefore, male labour participation rate, was chosen as an indicator of labour market performance.

# 2 Social capital

Since the late 1990s, social capital has come to be one of sociological theory's most noticeable contribution to everyday language. Alejandro Portes (1998) stated that ever since the concept entered the mainstream discussion it has "… evolved into something of a cure-all for the maladies affecting society at home and abroad" (Portes, 1998, p. 2). Robert Putnam (2000) described social capital as the acknowledgement that social networks have some intrinsic, or objective, value. The value of social networks is therefore contained in themselves.  As with others forms of capital, for example physical- or human capital, social capital may increase the productivity of individuals and groups. Social networks increase the effect of the civic virtue as described by Putnam "… civic virtue is most powerful when embedded in a dense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital" (Robert Putnam 2000, p. 19). An early contribution to this field was that of Edward C. Banfield (1958) who showed how lack of social capital could be detrimental to economic development. Banfield studied a poor village in southern Italy and traced the causes of poverty to a set of values that were detrimental to economic performance. In particular, people tended to trust other family members but put less trust into other members of the community. These differences across the regions of Italy may help explain the vast difference in labour market performance within that country as we will see.

These notations from Putnam and Banfield are however tantamount to what classical sociologists have been reporting since the beginning of the discipline. It recaptures, according to Portes (1998), Durkheim's emphasis on group activity as an antidote to anomie and self-destruction and the distinction Marx drew between atomized and mobilized classes (Portes, 1998, p. 2). Putnam and Banfield, amongst others, have nonetheless brought together the perspectives of economics and sociology, and economists and scholars from other disciplines, have ever since, be able to introduce social capital as an important determinant of macroeconomic performance (Portes, 1998, Carel van Schaik 2002).

Coleman (1988, 1990) described social capital by explaining how it comes into existence. Members of society control certain limited resources and these resources vary across individuals. Thus one might find it in one's self-interest to establish cooperation with others in order to enjoy together the benefits of combined resources. Through such cooperation between individuals their relationship is transformed, generating social capital just as physical capital is forged by changes in materials or human capital is the result of a change in person's abilities (Coleman, p. 100, 1988). Coleman attributes the value of the concept of social capital to the fact that it identifies certain aspects of social structure by their functions, just as the concept 'chair' identifies certain physical objects by their function. The function identified by the concept of 'social capital' is the value of these aspects of social structure that individuals can use to achieve their goals. [4]

## 2.1 Trustworthiness of social structures

One of the forms of social capital Coleman (1988) highlights is trustworthiness. Coleman's description of trustworthiness can be summed up by the following example:

> If *A* does something for *B* and trusts *B* to reciprocate in the future, this establishes an expectation in *A* and an obligation on the part of *B* (Coleman, p. 102, 1988).

In most societies, plenty of these obligations are outstanding on both sides of the relation across members, which is Coleman characterized in the phrase "people are always doing things for each other" (Coleman, p. 102, 2008). This depends on two elements: can members of society expect others to hold their obligations towards them and to what extent that obligation is held. When structures like these can be upheld it may be regarded as a form of social capital.

Trust facilitates communications and therefore, through the eyes of an economist, facilitates transactions. Stephen Knack and Philip Keefer (1997) stress the importance of trust in incomplete contracts because it decreases the level of uncertainty. In higher-trust societies the members can spend less time and resources protecting themselves from being exploited during transactions and thus a written contract might not be needed. Guido Tabellini (2010) discussed the economic importance of trust from the angle of the prisoner's dilemma. Tabellini came to the conclusion by the same line of reasoning that

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[4] See Coleman (1988), p. 101.

trust increases the efficiency of anonymous markets exchange and reduces the need for external enforcement of contracts.

From a philosophical point of view trust can be regarded as the act of inviting someone to be in control of discretionary powers while relying on their goodwill. Annette Baier (1986) maintained that "Trust [then], on the first approximation, is accepted vulnerability to another's possible but not expected ill (or lack of good will) toward one" (Baier, 1986, p. 235). According to Baier, trust may take on variety of forms but they all have to do with vulnerability and grounds for not expecting others to take advantage of it. The individual cannot be self-sufficient as a unit and needs to accept his/her vulnerability in order to exist as a member of society. Trust is therefore essential to our existence. Baier points out that when we communicate with others we have to be able to trust them even though we don't realize it. Paul Zak and Stephen Knack (2001) offer other examples of trust relationships that may seem to partly contradict Baier's suggestion. They refer to the work of Thomas Hobbes who claimed that trust between strangers was derived from the government alone, and thus had nothing to do with goodwill. The other example is from John Stuart Mill who stated that the fear of being exposed as violators of moral norms motivated members of society to hold to their obligations because otherwise they would harm their reputation, which doesn't really rely on goodwill either.[5] However, even though the government or one's reputation may provide external sanctions that decrease one's vulnerability in relation to others it is not necessarily a form of trust in Baier's discussion. She states that one comes to realize what trust involves retrospectively once we notice our vulnerability after someone has done us harm. Even though the external sanctions might have played a part in keeping the individual from harm it does not mean that while the individual was not harmed he/she trusted the ones who eventually hurt him/her. That is not to say that the sanctions in play do not contribute and nourish trust but they are necessary, but not sufficient, conditions. There is a reason for why a distinction is made between trustworthiness and norms and effective sanctions as a form of social capital, as we will now see.

## 2.2 Norms and effective sanctions

Norms and effective sanctions can also be considered to be a form of social capital. Norms can inhibit criminal activity; encourage solidarity and so on. According to

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[5] See Zak and Knack 2001, p. 298.

Coleman (1988) norms arise as attempts to reduce negative external effects or encourage positive ones.[6] There is no explicit definition of norms in this regard. It is however useful to think about why it is possible to walk alone at night or why promising athletes are encouraged to pursue a career in athletics. The society reacts to certain behaviour in a certain way, depending on which actions it deems desirable.

In order for norms to take effect there has to be room for an effective sanction and an effective sanction will not be enforced unless the social structure allows it. The members of the society, which provide the demand for a norm, have to be able to combine forces and constrain others members' actions and that requires repeated communications, which take place in a closed network. This is may be further described by Figure 1, below.
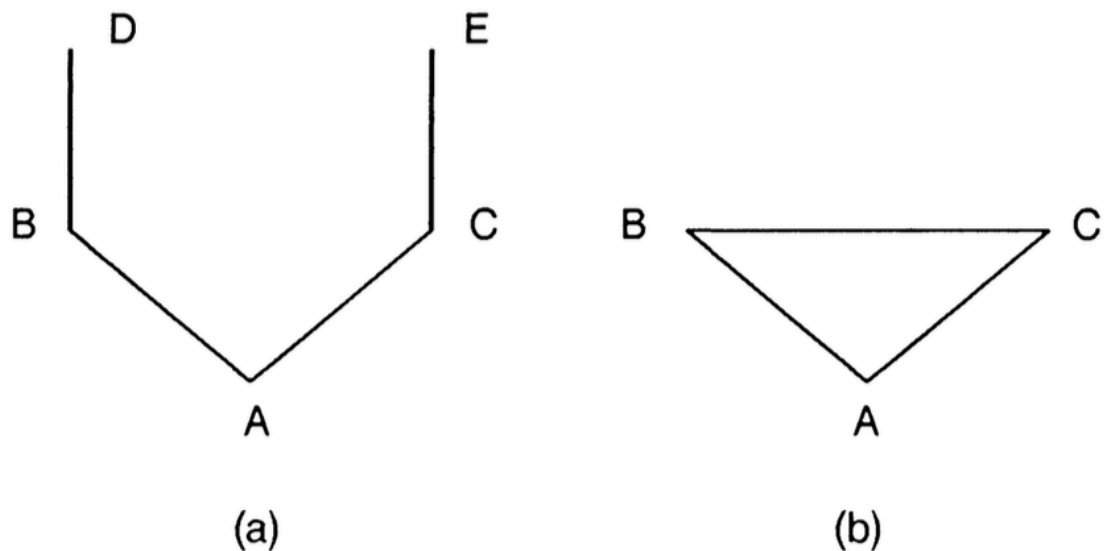


**Figure 1 Networks without or with closure (James Coleman, p. 106, 1988).**

The social structure on the left of Figure 1 marked (a) exhibits a network without closure. Person *A* has relations with *B* and *C* and can carry out actions that impose negative externalities on *B* and *C* individually or separately. Persons *B* and *C* have no relations with one another so they cannot combine forces to sanction *A*. Person's *A* actions will therefore not be constrained unless either *B* or *C* can sanction *A* alone. In the social structure on the right however *B* and *C* can combine forces and provide a collective sanction (Coleman, 1988).

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[6] See p. 105.

The closure of networks further plays a role in trustworthiness. Trust allows for obligations and expectations to enter circulation in the sense that abandoning one's obligations is a negative externality imposed on those who are expecting the obligation to be held. Without a closed network this kind of behaviour can only be sanctioned by the person/s the obligation is owed. However, collective sanctions that should ensure trust can't be applied in an open structure. The formation of reputation or other sanctions of this particular kind requires repeated communications. Coleman (1988) therefore concludes that closure of networks is essential to trustworthiness.

Trust, norms and effective sanctions are the offspring of closed networks and these networks' functions provide the individuals with the resources needed to achieve their goals. That is what we regard as social capital.

Those findings are consistent with the analysis of the economic performance of various regions of Italy carried out by Putnam et al. (1993). They argued that the Northern regions of Italy were performing relatively better than those in the South because the Northerners lived a richer association life. The people in the South were more reliant upon national initiatives as opposed to the Northerners which exploited the capital characteristics of local communities. In correspondence with Coleman's findings the networks in the North likely provided the valuable closure while the ones in the South did not.

## 2.3   Recent studies

Delhey and Newton (2003) tested six main theories on the origins of social trust using survey data from the *Euromodule*, which maps individuals living conditions and the quality of society.[7] By running a series of multiple-logistic regressions they found that, generally speaking, social trust is higher amongst people where public safety is high and were there are few social conflicts.[8] Informal social networks also happen to be associated with trust and those who are successful in life tend to be more trusting than the unsuccessful one's. Based on these outcomes they tried to build upon their research and predict cross-national levels of social trust for 55 countries (Delhey and Newton, 2005).

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[7] The countries included in the study were: South Korea, Switzerland, East Germany, West Germany, Spain, Hungary and Slovenia.

[8] By social conflict the authors refer to general conflicts between income groups, classes, nationals and immigrants and so on (Delhey and Newton, p. 99, 2003).

After running bivariate correlation analysis between generalized social trust and list of independent variables they performed multivariate regression analysis on the independent variables with the highest correlation. It turned out that ethnic homogeneity and Protestant traditions were the best performing indicators in order to predict social trust. However, the Scandinavian countries happen to have the highest levels of trust in addition to extreme scores in the highest performing indicators of social trust. When these countries were withdrawn from the regression the explanatory power of the model diminished considerably. Multiple studies have demonstrated a statistical relationship between trust towards fellow citizens, as reported in surveys, national output and income per capita.[9,10] Tabellini (2010) used cultural variables to explain the variation in output per capita and the growth of output in European regions. He used three questions from the World Values Survey to describe the positive aspects of culture – one measured trust towards other people; another tolerance and respect for other people and the third the degree to which people feel they have control over their own lives – and the extent to which parents try to teach their children to be obedient as a negative cultural trait. After controlling for education he found that the principal component of these values variables could help explain differences in output and growth across regions, literacy at the end of the 19th century and indicators of political institutions between 1600 and 1850 being used as instruments for output and growth.

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[9] See Knack and Keefer (1997), Zak and Knack (2001), Algan and Cahuc (2013) and Bjornskov (2012).

[10] A recent study by Brueckner (2015) finds that the causality is the other way around – a fall in income per capita (caused by higher oil prices) makes trust fall.

# 3   Social capital and the labour market

There is evidence that differences in social structures affect the behaviour of workers on the job. Ichino and Maggi (1999) found that there were significant differences in the level of shirking – measured by absenteeism and misconduct – among employees of a large Italian bank so that shirking is more prevalent in the bank branches located in southern Italy. They found that individuals born in the south shirk more than those born in the north. In addition, workers shirk significantly more when they work in the south than when they work in the north. Interestingly, the level of shirking of a given individual depends on the level among his co-workers, meaning that if your co-workers are shirking while on the job you are more likely, than not, to follow their line of conduct. Thus moving from a branch in the south to a branch in the north would make a worker decide to shirk less. Ichino and Maggi observed that workers who decide to leave the southern branches tend to shirk less than those who decide to stay, which, magnifies the distinction between the north and the south. Of these factors the most important one is the demographic background of the individual. These results are consistent with the predictions of Putnam et al. (1993) that social interactions in the north and the south differ due to differences in their medieval history, which results in dissimilar traditions in civic involvement.[11]

The link between values and labour market outcomes can be described using commonly used economic models since employer-employee relations are of the principal-agent kind. Thus in the model of Shapiro and Stiglitz (1984) the relationship between an employer and an employee is described by a principal agent problem. The employer would like a worker to work hard but the latter has an incentive to shirk his/her duties but is restrained from doing so by a combination of monitoring, the risk of unemployment and other offsetting incentives, which may serve as disciplinary devices. Clearly, a worker's background – his values and attitudes towards achieving on the job, taking the initiative – and the values instilled in him by parents as a child will affect his utility he gets from shirking his duties, as found in the study of Ichino and Maggi (1999). When workers enjoy shirking their duties the employer may be forced to establish a non-

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[11] See Putnam (1993 pp. 183-184).

shirking condition to alter his/her expected lifetime utility in a way that the employee is better off not shirking. The consequences of establishing the non-shirking condition are higher critical wages. By analysing a steady state equilibrium, the authors illustrated that no shirking is inconsistent with full employment, which eventually translates into involuntary unemployment.

# 4 Methodology

Following Coleman (1988), the goal is to identify functions of networks – aspects of social capital – by their function, particularly those that may affect workers' performance on the job. These are trust towards fellow citizens; the importance of work; the extent to which people value job security, being able to take the initiative and having the opportunity to achieve on the job; and the attitudes parents would like to instil in children – obedience, independence, hard work, imagination, tolerance and respect of others, determination and responsibility. In all these variables there are twelve numbers for each of Europe's NUTS 2 regions. The effect of these values on labour market performance, in particular, the rate of unemployment, the male participation rate and average hours worked, will then be estimated using statistical procedures.

We differ from Tabellini (2010) in focusing on labour market performance at the regional level as well as in the choice of empirical methods, to which we now turn. To facilitate comparison we report our results for the Tabellini sample of eight European countries in addition to our larger sample of 28 countries and a sample of Western European countries that has several countries not included in the Tabellini study.[12]

The aspects that we are interested in should affect labour market performance and therefore help explain differences in unemployment, labour force participation of men and average hours worked. To identify which factors belong to social capital we use a method proposed by Harold Hotelling (1936) called canonical correlation analysis.

Canonical correlation analysis is a method that makes sense of the cross-covariance matrices of two multidimensional variables. In our context social capital is one such multidimensional latent variable, each dimension representing aspects of social capital. Labour market performance is another multidimensional latent variable, the dimensions being the rate of unemployment, the rate of male labour market participation and average hours worked. We expect a significant association between two multivariate latent variables – the one measuring social capital and the other labour market outcomes – and the CCA is simply the bivariate correlation between them.

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[12] These are Austria, Denmark, Finland, Greece, Iceland, Ireland, Luxembourg, Malta, Sweden and Switzerland.

To perform the canonical correlation, we gather together some observed measures into two different variable sets, $X$ and $Y$, which represent the two multi-dimensional components of the latent variables, henceforth known as the canonical variables $X$ and $Y$. The variable $X$ is our measure of social capital and the variable $Y$ is our measure of labour market outcomes. Next we assign weights to the variables within $X$ and $Y$ in order to create two linear combinations $X^*$ and $Y^*$; one for each variable set, which maximize the bivariate correlation between the canonical variables. The set of linear combinations, called canonical functions, are chosen to maximize the canonical correlation between the two latent canonical variables $X^*$ and $Y^*$. Several uncorrelated components or functions can be determined, as in principal components analysis. The first function creates the linear combination so the two latent variables are as strongly correlated as possible. However there probably will be some residual variance left over, which cannot be explained by the first canonical function. That means we can find another linear combination, which maximizes the correlation between $X^*$ and $Y^*$ given the residual variance subject to the constraint that the new function has to be perfectly uncorrelated with the previous one. This gives us another set of $X^*$ and $Y^*$. This process can be repeated, as many times as there are variables in the smaller variable set or until there is no residual variance left. When all the canonical functions have been retrieved the researcher may begin to interpret the results.[13] Appendix 1 has the definitions of important concepts for the interpretation of the results following an example described by Sherry & Henson (2005).

Having derived a measure of social capital we then perform regression analysis where we regress regional unemployment on country dummies and the canonical variable $X^*$, which is our measure of social capital. We use three data sets. The first contains regions belonging to 28 European countries[14]; the second has the sample of countries used by Tabellini (2010)[15]; and the third only includes regions in countries in Western Europe.[16]

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[13] For a more thorough discussion of CCA see Tacq & Tacq, (1997) and Sherry & Henson (2005).

[14] Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

[15] These are Belgium, France, Germany, Italy, Netherlands, Portugal, Spain and the U.K.

[16] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, Switzerland and the United Kingdom

# 5   Empirical results

We proceed first to perform the canonical correlation analysis and then to use our derived measure of social capital in an unemployment regression.

## 5.1   Social capital calculated

As described above the variables used fall into two groups. The first group consist of the values and norms that may affect labour market performance. Those are the level of trust; the importance of work; how much people value job security, being able to take the initiative on the job and being able to achieve on the job; the importance parents attach to making their children obedient, independent, hard-working, imaginative, tolerant, determined and, finally responsible. The second group of variables has the three output variables that reflect labour market performance. They are the rate of unemployment; the male labour market participation rate, and average hours worked. A more detailed variable description is shown in Table 5 in Appendix 2.

In Table 1 we report the results of the canonical correlation analysis for a set of 249 regions in 28 countries.[17] The results consist of three functions, each of them generating a canonical correlation. The first function is the most important, the second has another linear combination that maximizes the correlation between $X^*$ and $Y^*$ given the residual variance subject to the constraint that the new function has to be perfectly uncorrelated with the previous one and so on.

The first column in each function has standardised coefficient, which is the weight attached to the variables to generate the linear combination $X^*$ or $Y^*$ so as to maximise the correlation between the two.[18] It can further be interpreted as the relative contribution of the variable to the canonical variable given the contribution of others. The second column has the structure coefficient, which is the bivariate correlation between each observed variable and the latent variable, $X^*$ or $Y^*$. The higher the value of the structure coefficient, the more correlated the variable is with the relevant latent variable. For

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[17] Table 6 in Appendix 3 provides list of the regions in question.

[18] They are standardized because of the constraint that the variance of the pair of canonical variables in a canonical function are equal; var($X^*$) = var($Y^*$).

clarification it may be thought of as the direct contribution of the measured variable to the latent canonical variable. The sign of the coefficients is likewise important. Generally, the sign of the standardised and the structure coefficients are the same. In the few cases that they are not the same the sign of the structure coefficient is considered more informative.[19] The third column lists the squared value of the structure coefficient, which shows the proportion of the variance an observed variable shares linearly with a latent variable. Finally, the last column is the communality coefficient, which sums up the squared value of the structure coefficients and hence gives an assessment of the importance of each observed variable for the model as a whole.

[19] It might for example be the case that the effect of the standardized coefficient for a certain variable is picked up by another variable, which implies the presence of multicollinearity. Theoretical insight is thus needed for explanation.

**Table 1.** Regions, work ethics & economic outcomes, sample of 28 countries

| Variable | Function 1 | | | Function 2 | | | Function 3 | | | Com. Coef |
|---|---|---|---|---|---|---|---|---|---|---|
| | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | |
| Trust | 0,331 | 0,783 | 61,31% | 0,105 | 0,050 | 0,25% | -0,006 | 0,039 | 0,15% | 61,71% |
| Importance of work | -0,228 | -0,425 | 18,04% | -0,105 | -0,018 | 0,03% | 0,430 | 0,474 | 22,51% | 40,57% |
| Job security | -0,088 | -0,242 | 5,83% | -0,256 | -0,308 | 9,50% | 0,407 | 0,046 | 0,21% | 15,55% |
| Job initiative | 0,229 | 0,231 | 5,35% | 0,634 | 0,297 | 8,84% | 0,454 | 0,034 | 0,11% | 14,31% |
| Job achieve | -0,067 | -0,026 | 0,07% | -0,474 | 0,017 | 0,03% | -0,562 | -0,245 | 5,99% | 6,09% |
| Children obedience | -0,100 | -0,270 | 7,31% | 0,422 | 0,315 | 9,92% | -0,462 | -0,579 | 33,47% | 50,70% |
| Children independence | 0,058 | 0,368 | 13,56% | 0,064 | -0,089 | 0,78% | -0,625 | -0,151 | 2,28% | 16,63% |
| Children hard work | -0,493 | -0,801 | 64,18% | 0,749 | 0,318 | 10,09% | -0,131 | -0,255 | 6,51% | 80,78% |
| Children imagination | 0,082 | 0,368 | 13,55% | 0,125 | 0,095 | 0,91% | 0,265 | 0,063 | 0,40% | 14,85% |
| Children tolerance | 0,192 | 0,478 | 22,81% | 0,575 | 0,515 | 26,50% | 0,140 | 0,136 | 1,85% | 51,16% |
| Children determination | -0,167 | -0,073 | 0,54% | 0,097 | 0,072 | 0,51% | 0,189 | 0,333 | 11,08% | 12,13% |
| Children responsibility | -0,121 | 0,074 | 0,55% | 0,395 | 0,136 | 1,84% | 0,210 | 0,624 | 38,99% | 41,38% |
| Unemployment | -0,085 | -0,649 | 42,11% | 0,479 | -0,088 | 0,77% | 1,195 | 0,756 | 57,12% | 100,00% |
| Male participation | 0,513 | 0,829 | 68,74% | 1,160 | -0,537 | 28,80% | 0,305 | -0,156 | 2,44% | 99,99% |
| Worked hours | -0,603 | -0,863 | 74,55% | 0,755 | -0,444 | 19,73% | -0,605 | -0,239 | 5,72% | 100,00% |

| Canonical correlation coefficients | | | Sq. Canonical correlation coefficients | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 1 | 2 | 3 |
| 0,796 | 0,441 | 0,256 | 0,633 | 0,194 | 0,065 |
| *** | *** | * | | | |

*** indicates 99% significance, ** indicates 95% significance and * indicates 90% significance.

From the second column of Table 1 in Function 1 we can see that the most important component of social capital is trust – with a structure coefficient of 0.783 – followed by teaching children to be tolerant – structure coefficient of 0.478 – imaginative – structure coefficient of 0.37 and independent – structure coefficient of 0.386 – followed by valuing initiative on the job – structure coefficient of 0.231. There are two variables having a negative correlation; teaching children to work hard – structure correlation of -0.801 – and finding work important – structure coefficient of -0.425. The negative correlation for the last two variables could possibly be explained by high unemployment making people value having a job and working hard. Remember that the statistical analysis does not prove correlation. These variables together generate the latent variable $X^*$, which is our measure of social capital. The labour market performance variable $Y^*$ is a function of unemployment, male participation and the number of average hours worked. Of the three, participation is positively correlated with $Y^*$ – with a structure coefficient of 0.829 – and unemployment and average hours are strongly and negatively correlated with $Y^*$ – having structure coefficients of -0.649 and -0.863 respectively. Thus a higher value of $Y^*$ indicates better labour market performance if we assume that employed workers enjoy their time away from work. It follows that greater social capital $X^*$ is positively correlated with labour market outcome $Y^*$, which is positively correlated with participation and negatively correlated with unemployment and hours worked. The canonical correlation is 0.796 between the two latent variables, $X^*$ and $Y^*$. The canonical correlations for the other two significant functions are much lower, 0.441 and 0.256 respectively.

Looking at the difference in social capital, reported in Table 2, between the regions with the highest and lowest value of social capital, which is derived from the result in Table 1, we find that Zahodna in Slovenia is lowest with a value of social capital equal to -62.43 and Copenhagen in Denmark has the highest values of 25.94. The next four top regions are also found in Denmark and Sweden. At the bottom we find regions in Poland, Bulgaria and Romania.

**Table 2.** Social capital: The top five and bottom five regions

| Highest social capital | | | Lowest social capital | | |
|---|---|---|---|---|---|
| *Region* | *X\** | *U* | *Region* | *X\** | *U* |
| Copenhagen (Denmark) | 25,9 | 4,00% | Zahodna Slovenija (Slovenia) | -62,4 | 4,60% |
| Mellestra Norrland (Sweden) | 25,4 | 6,80% | Oplskie (Polland) | -60,4 | 15,70% |
| Nordjylland (Denmark) | 25 | 4,00% | Swverozapaden (Bulgaria) | -60,1 | 15,40% |
| Midtjylland (Denmark) | 24,3 | 5,00% | Nord-Est (Rumania) | -59,8 | 5,60% |
| Smaland med öarna (Sweden) | 24,2 | 5,00% | Yuzhen tsentralen (Bulgaria) | -58,7 | 10,90% |

Table 7 in Appendix 4 repeats the analysis of Table 1 but only for countries that were included in the study of Tabellini (2010) on social capital and productivity and Table 8 – also found in Appendix 4 – omits several Easter European economies from the sample of 28 countries. The results are broadly identical except for the variable measuring parent's emphasis on teaching children to be tolerant having a very low correlation with social capital in the Tabellini sample and the variable measuring the extent to which parents teach them to be determined having a larger positive correlation.

Figure 2 has scatterplots that show the relationship for the sample of 28 countries between social capital $X^*$ and labour market performance $Y^*$. The top graph has the regional data while the bottom graph uses simple averages of regions for each country. Remember that a higher level of $Y^*$ implies lower unemployment and higher participation and hence better performance. A clear upward-sloping relationship emerges so that a higher level of social capital and better performance go together. The best performing countries are Denmark and the Netherlands, both have a very high level of social capital and good performance. Other countries with high levels of social capital are Sweden, Switzerland, Finland, Iceland, Austria and Germany. The countries of Eastern Europe, Portugal, Greece and Italy have lower levels of social capital and labour market performance.

There is a wide variation within countries when it comes to levels of social capital and labour market performance. The differences are especially profound in Italy where regions further in the north (Lombardia, Piedmont, Abruzzo, Liguria and Valle d'Aosta) have much higher levels of social capital and better economic performance than the once in the south (Sardinia, Sicily, Basilicata, Apulia, Calabria, Molise and Campania). Similarly, there are regions in the eastern part of Germany that have lower levels of social capital. This is Berlin, Dresden and Mecklenburg-Vorpommern. The one formerly East German region that does not have lower level of social capital is Sachsen-Anhalt. In the U.K. Inner London, Tees valley and Durham, South Western Scotland and East

Wales have low levels of social capital and bad labour market performance whereas Berkshire, Buckinghamshire and Oxfordshire, Surrey, Sussex, Dorset and Somerset and East Anglia have high social capital and good performance.





**Figure 2 Social capital and labour market performance**

Figure 3 below shows the scatter plot of unemployment against the social capital variable.
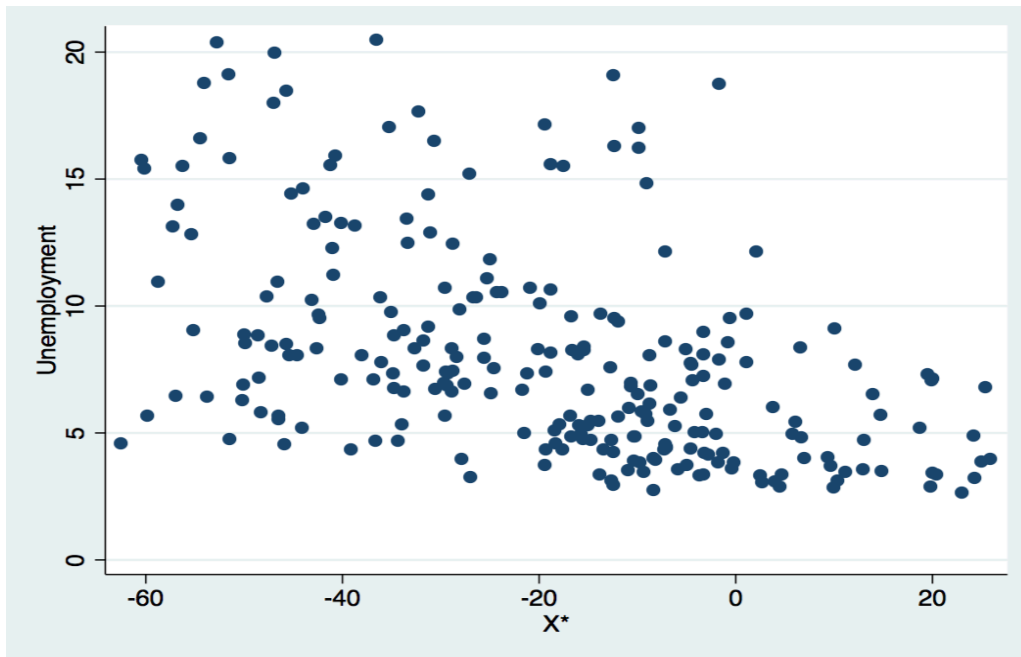
**Figure 3 Social capital and unemployment**

There is a clear downward sloping relationship between the two variables. The countries in the lower right-hand corner include Denmark, the Netherlands. Figure 4 has the relationship between social capital and average hours worked where the relationship is even stronger. Again, the countries in the lower left-hand corner include the Netherlands.
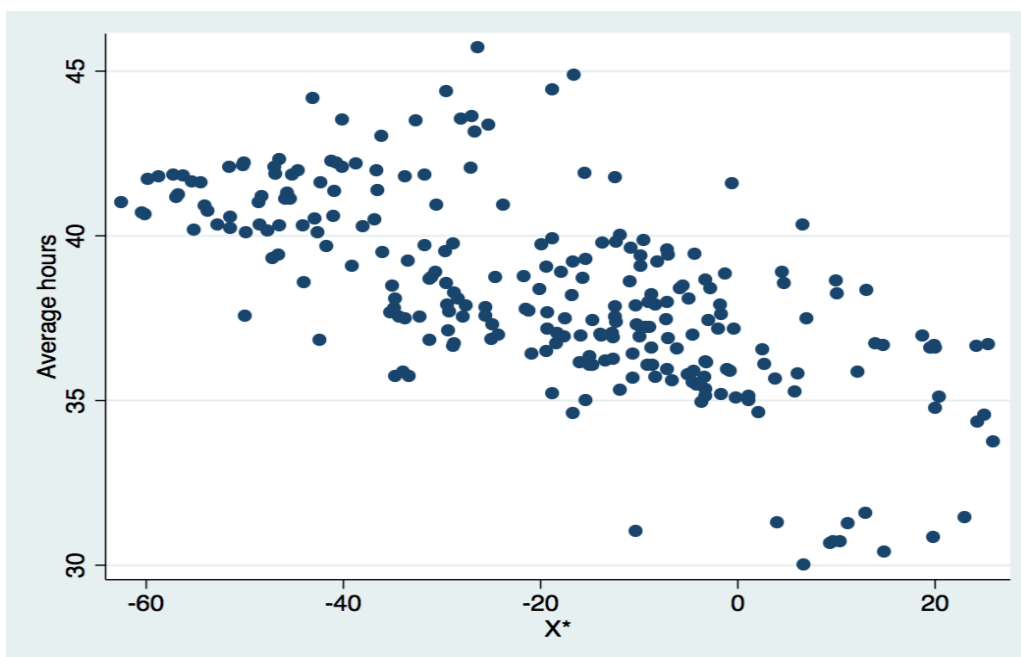


**Figure 4 Social capital and average hours worked**

Finally, Figure 5 has the male labour force participation rate against the social capital variable. There is a clear positive relationship between the two variables.
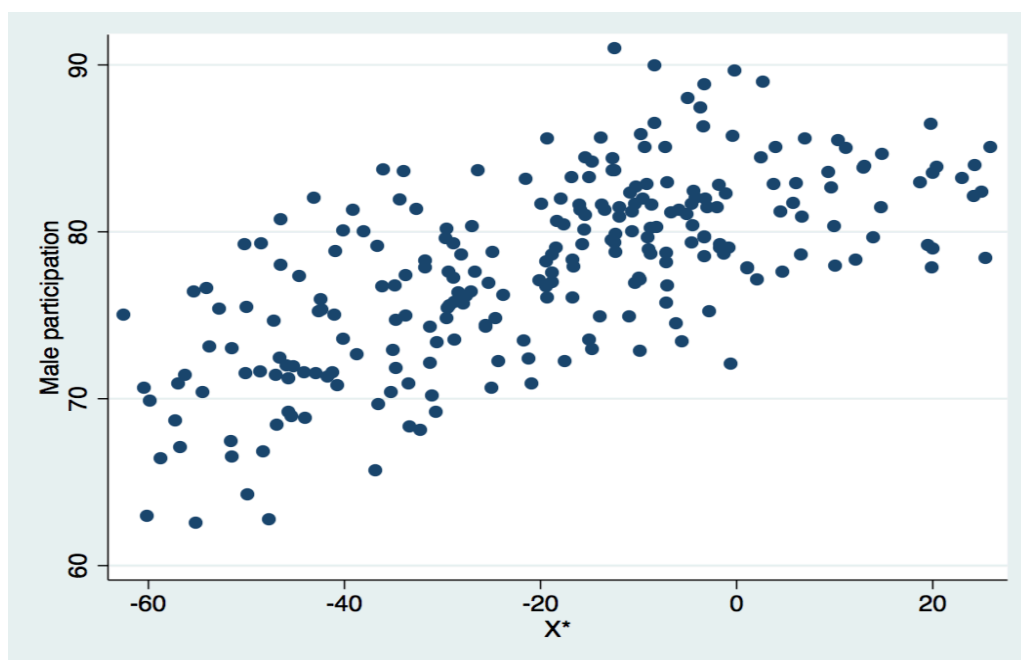


**Figure 5 Social capital and the male labour force participation rate**

## 5.2  Unemployment equations

The literature on unemployment in the OECD mainly attempts to explain differences in mean unemployment across countries and changes in unemployment within countries. In so doing it attempts to answer questions such as why unemployment in Spain is higher than in most other European countries and why it rose in the 1970s and 1980s; why unemployment in Europe was lower than in the United States until about 1970 and higher afterwards; why unemployment in Denmark and the Netherlands fell in the 1990s and so on. This approach stands in contrast with our treatment of social capital at the regional level, which allows for variation in labour market performance and social capital within countries. In this section we give a summary of the mainstream explanations for unemployment and then estimate equations where social capital is used as a regressor alongside country dummy variables that capture omitted country level variables used in the unemployment literature.

The macroeconomic studies of unemployment fall into two groups: There are models of flows in and out of unemployment and there are models of the level of employment and unemployment. The causal factors also fall into two groups. In group of studies there

are macroeconomic variables that cause changes in the mean level of unemployment. In the other group of studies high unemployment is explained by a set of labour market institutions. Phelps (1994) belongs to the first group by showing how the (world) real rates of interest may affect unemployment through their effect on hiring, price setting and investing. In related work higher stock prices – as in Phelps and Zoega (2001) – bring unemployment down by raising investing in training and physical capital. There is also the effect of changes in the rate of productivity growth that can be shown to affect unemployment – as in Pissarides (2000), Ball and Moffit (2001) and Hoon and Phelps (1997). There is also the effect of higher oil prices in reducing labour demand and causing higher unemployment, see Carruth et al. (1998). Other studies of unemployment emphasise the role of labour market institutions. Nickell et al. (2005) find that differences in labour market institutions across countries and changes in these institutions over time can account for the variation of unemployment over time and across countries. The institutions include the system of unemployment compensation, the organisation of labour unions and rules and regulations regarding redundancies. Blanchard and Wolfers (2000) combine the two approaches and emphasize both macroeconomic shocks and labour market institutions by including interaction terms between shocks and institutions in their unemployment equations, following Phelps (1994) and Layard Nickell and Jackman (1991).

In Table 3 we report results of the estimation of an unemployment equation where unemployment depends on country dummy variables – controlling for omitted macroeconomic and institutional variables – and our estimate of social capital $X^*$. The data are regional and, as before, the unemployment rate is measured as the average level from 2001 to 2008 and social capital is calculated in the previous section of this paper based on 2008 survey data. For the least squares estimates in Table 3 we find that the coefficient of social capital is negative and significant at the 1% for all three samples. We conclude that the relationship between unemployment and social capital is not spuriously capturing the effect of macroeconomic factors and institutions on unemployment. The next four columns have the IV estimates. The hypothesis that social capital is endogenous is examined in the regressions. We explore several instruments that all have references to earlier writings surveyed in Section 2.3.[20] Potential instruments suggested

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[20] See Knack and Keefer (1997), Zak and Knack (2001), Delhey and Newton (2003), Delhey and Newton (2005) and Tabellini (2010) for further details.

by this literature such as population density, the protestant religion, the size of towns and the level of trust in public institutions did not have sufficient association with the dependent variable. Participation in voluntary organizations, on the other hand, as measured by the average percentage of respondents in the *European Values Study* who participated in voluntary organizations, looks promising. The outcomes of Durbin and Wu-Hausman tests for exogeneity, using voluntary organizations as an instrument, all rejected the null hypothesis that $X^*$ should be treated as an exogenous estimate and thus participation in voluntary organizations has the desired impact as an instrument. The hypothesis that participation in voluntary organisations is a weak instrument can be rejected at 1% level in all three samples. The IV estimates in Table 3 show that social capital is negatively related to unemployment at the 1% level in all three samples.[21] The numerical estimates are larger than from the least-squares regressions.[22]

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[21] The Tabellini sample (F=15.13); Western Europe (F=11.26); and 28 countries (F=17.44).

[22] In Table 9 Appendix 5, we replace our measure *X\** of social capital by trust. The first three columns of Table 9 have the OLS estimates for the three samples (28 countries, the Tabellini sample and Western Europe). The next three columns have IV estimates where trust is treated as an endogenous variable. Here the OLS estimates find a strong negative relationship between trust and unemployment but we fail to find instruments for trust using the tests applied to the social capital regression.

**Table 3.** Unemployment explained by social capital $X^*$

| Variable | Least Squares | | | IV | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 1 | 2 | 3 |
| | Coef | Coef | Coef | Coef | Coef | Coef |
| $X^*$ | -0,08 | -0,09 | -0,08 | -0,25 | -0,25 | -0,32 |
| Std. dev | (0,02)*** | (0,02)*** | (0,02)*** | (0,08)** | (0,08)*** | (0,11)*** |
| Austria | -0,73 | | -0,23 | 1,44 | | -2,87 |
| Belgium | 1,51 | 0,64 | 2,98 | 1,39 | 0,32 | -0,12 |
| Bulgaria | 3,49 | | | -3,29 | | |
| Czech Republic | -0,71 | | | -4,02 | | |
| Denmark | 0,74 | | 1,90 | 7,34 | | 7,22 |
| Estonia | omitted | | | -4,47 | | |
| Finland | 5,18 | | 5,83 | 9,58 | | 6,68 |
| France | 1,17 | 0,14 | 2,86 | -1,05 | -2,40 | -2,55 |
| Germany | 3,34 | 2,49 | 4,49 | 4,90 | 3,71 | 2,80 |
| Greece | 2,85 | | 3,17 | 0,60 | | -6,10 |
| Hungary | -1,64 | | | -6,90 | | |
| Iceland | -2,86 | | omitted | -2,26 | | 1,78 |
| Ireland | -1,56 | | 0,21 | -1,89 | | -2,36 |
| Italy | 3,66 | 3,23 | 5,27 | 2,05 | 1,67 | 0,49 |
| Latvia | 1,22 | | | -3,20 | | |
| Lithuania | 2,07 | | | -1,14 | | |
| Luxembourg | -3,13 | | -0,50 | -5,11 | | -2,95 |
| Malta | -0,29 | | 1,69 | -2,58 | | -3,01 |
| Netherlands | -0,40 | omitted | 1,37 | 4,02 | 6,11 | 5,35 |
| Poland | 7,54 | | | 2,57 | | |
| Portugal | -1,60 | -1,57 | 1,33 | -5,76 | -3,92 | -3,31 |
| Romania | -2,00 | | | -7,87 | | |
| Slovakia | 5,35 | | | -0,90 | | |
| Slovenia | -3,01 | | | -8,15 | | |
| Spain | 4,00 | 2,07 | 4,36 | 4,60 | 0,49 | -0,82 |
| Sweden | 3,20 | | 4,48 | 9,20 | | 9,33 |
| Switzerland | -1,39 | | -0,07 | 0,62 | | -0,63 |
| UK | -0,82 | 7,75 | 0,96 | omitted | omitted | omitted |
| Observations | 249 | 146 | 195 | 249 | 146 | 195 |
| Adjusted R-squared | 0,58 | 0,38 | 0,43 | | | |

*** 99% significance, ** 95% significance, * 90% significance

1   Sample with 28 European countries

2   Tabellini sample

3   Western Europe

Table 4 shows the five regions with the lowest and highest average rates of unemployment between 2001 and 2008 and their level of social capital. Clearly, the high-unemployment regions have much lower levels of social capital than the low-

unemployment regions and this difference can help account for the difference in unemployment rates.

**Table 4.** High- and low-unemployment regions

| Lowest average unemployment | | | Highest average unemployment | | | Unemployment difference | Difference explained by X* | |
|---|---|---|---|---|---|---|---|---|
| *Region* | X* | U | *Region* | X* | U | Δ U | OLS (-0,08) | IV (-0,25) |
| Zeeland (Netherlands) | 23,1 | 2,60% | Dolnoslaskie (Poland) | -36,4 | 20,50% | 17,9 | 4,8 | 14,9 |
| Zentralschweitz (Switzerland) | -8,3 | 2,70% | Wýchodné Slovensko (Slovakia) | -52,7 | 20,40% | 17,7 | 3,6 | 11,1 |
| Tirol (Austria) | 10 | 2,80% | Zachodniopomorskie (Poland) | -46,8 | 20,00% | 17,2 | 4,5 | 14,2 |
| Salzburg (Austria) | 4,5 | 2,90% | Warminsko - Mazurskie (Poland) | -51,5 | 19,10% | 16,2 | 4,5 | 14 |
| Utrecht (Netherlands) | 19,8 | 2,90% | Mecklenburg Vorpommern (Germany) | -12,4 | 19,10% | 16,2 | 2,6 | 8,1 |

The unemployment differences between the top regions on each list and each of the four regions below that on the list vary between 16.2% and 17.9%. To account for this variation one can take the difference in social capital and multiply by the estimated coefficient of social capital in Table 3. In the next-to-last column we use the least-squares estimate from column (1) and in the last column we use the IV estimate from column (4). Using the former differences in social capital can account for between 2.6% and 4.8% of the unemployment difference while using the IV estimates can account for between 8.1% and 14.9% of the difference. Based on the IV estimates most of the unemployment differences are accounted for by differences in social capital, leaving only a small part of the difference to the country dummy variables that capture institutions and macroeconomic developments at the country level.

# 6  Conclusions

In this thesis social capital was defined as a set of values that affect workers' behaviour on the job. Using canonical correlation analysis, we found that teaching children to be independent, imaginative and tolerant contributes positively to social capital as does a higher level of trust towards fellow citizens. In contrast, teaching children to be obedient and hard-working, valuing job security and finding work to be important in life all contribute negatively to social capital. One explanation could be that societies where people have to learn to obey and work hard are societies were people cannot be trusted to do so when left alone, which indicates a lack of social capital.

Differences in social capital can account for a substantial proportion of the variation in regional unemployment even when country dummy variables are included. Thus there is very considerable heterogeneity in terms of social capital within countries and this heterogeneity can help explain differences in the rate of unemployment across regions. These differences are very stark within some of the large European countries such as Germany and Italy – the eastern regions of Germany and the southern regions of Italy having both lower levels of social capital as well as worse labour market performance.

We conclude that studying the macroeconomics of unemployment at the country level and omitting social capital from the analysis may generate misleading results. Countries may not always be the right unit of analysis and social capital affects workers' behaviour on the job and labour market outcomes. The effect of macroeconomic policies on social capital may therefore be limited.

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# Appendix 1

**Canonical correlation – main concepts**

- ➢ *Canonical correlation coefficient:* the correlation between the two latent variables X and Y on a given canonical function.

- ➢ *Squared canonical correlation:* represents the proportion of variance shared by the two latent variables. It indicates the amount of shared variance between the variable sets.

- ➢ *Canonical function:* Set of standardized coefficients from the observed variable sets.

- ➢ *Standardized coefficient:* the weights attached to observed variables in the two variable sets to yield the linear combinations that maximize the correlation between the two latent variables, i. e. the canonical correlation. They are standardized due to the constraint that the variance of the pair of canonical variables in a canonical function are equal, $var(X_i^*) = var(Y_i^*) = 1 \; \forall \; i$ where $i$ represents the number of canonical functions. This is vital in order to obtain unique values for the coefficients.

- ➢ *Structure coefficient:* the bivariate correlation between an observed variable and a latent variable, X or Y. They help to define the structure of the latent variable by estimating which observed variables contribute to the creation of the latent variable.

- ➢ *Squared structure coefficient:* the proportion of variance an observed variable linearly shares with a latent variable.

- ➢ *Communality coefficient:* the proportion of variance in each variable that is explained by all the canonical functions that are interpreted. It informs the researcher about the usefulness of the observed variable for the whole model.

# Appendix 2

**Table 5.** Variable descriptions

| Variable | Description | Source |
|---|---|---|
| Children determination | The percentage of people who mentioned determination, perseverance as a quality to teach children at home. | Q 52, EVS, (2011) |
| Children hard work | The percentage of people who mentioned hard work as a an quality to learn children at home | Q 52, EVS (2011) |
| Children imagination | The percentage of people who mentioned imagination as a an quality to learn children at home | Q 52, EVS, (2011) |
| Children independence | The percentage of people who mentioned independence as a an quality to learn children at home | Q 52, EVS (2011) |
| Children obedience | The percentage of people who mentioned obedience as a an quality to learn children at home | Q 52, EVS (2011) |
| Children responsibility | The percentage of people who mentioned feeling of responsibility as a quality to teach children at home. | Q 52, EVS, (2011) |
| Children tolerance | The percentage of people who mentioned tolerance and respect for other people as a quality to teach children at home. | Q 52, EVS, (2011) |
| Importance of work | The percentage of people who mentioned that work was very important in their life | Q 1, EVS (2011) |
| Job achieve | The percentage of people who mentioned the feeling you can achieve something as an important aspect of a job | Q 14, EVS (2011) |
| Job initiative | The percentage of people who mentioned the opportunity to use initiative as an important aspect of a job | Q 14, EVS (2011) |
| Job security | The percentage of people who mentioned job security as an important aspect of a job | Q 14, EVS (2011) |
| Male participation | The average labor force participation rate, % of total male population from age 15 to 65, from 2001 to 2008 | Eurostat (2014) |
| Trust | The percentage of people who answered the question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? " with "most people can be trusted" | Q 7, EVS (2011) |
| Unemployment | The average unemployment, total % of labour force from age 15 to 74, from 2001 to 2008 | Eurostat (2014) |
| Worked hours | Average number of usual weekly hours of work in main job by sex, age, from 2001 to 2008 | Eurostat (2014) |
| Group | The average total participation rate in voluntary organisations | Q 5, EVS (2011) |
| Protestant | The percentage of people who listed Protestantism as their religious denomination | Q 23a, EVS (2011) |

# Appendix 3

**Table 6.** List of regions

| | | |
|---|---|---|
| **Austria** | **Estonia** | Mecklenburg-Vorpommern |
| Burgenland | Eesti | Braunschweig |
| Niederösterreich | **Finland** | Hannover |
| Wien | Länsi-Suomi | Lüneburg |
| Kärnten | **France** | Weser-Ems |
| Steiermark | Ile de France | Düsseldorf |
| Oberösterreich | Champagne-Ardenne | Köln |
| Salzburg | Picardie | Münster |
| Tirol | Haute-Normandie | Detmold |
| Vorarlberg | Centre (FR) | Arnsberg |
| **Belgium** | Basse-Normandie | Koblenz |
| Bruxelles | Bourgogne | Trier |
| Antwerpen | Nord - Pas-de-Calais | Rheinhessen-Pfalz |
| Limburg (BE) | Lorraine | Saarland |
| Oost-Vlaanderen | Alsace | Dresden |
| Vlaams-Brabant | Franche-Comté | Sachsen-Anhalt |
| West-Vlaanderen | Pays de la Loire | Schleswig-Holstein |
| Brabant Wallon | Bretagne | Thüringen |
| Hainaut | Poitou-Charentes | **Greece** |
| Liège | Aquitaine | Anatoliki Makedonia, Thraki |
| Luxembourg (BE) | Midi-Pyrénées | Kentriki Makedonia |
| Namur | Limousin | Dytiki Makedonia |
| **Bulgaria** | Rhône-Alpes | Thessalia |
| Severozapaden | Auvergne | Ipeiros |
| Severen tsentralen | Languedoc-Roussillon | Ionia Nisia |
| Severoiztochen | Provence-Alpes-Côte d'Azur | Dytiki Ellada |
| Yugoiztochen | **Germany** | Sterea Ellada |
| Yugozapaden | Stuttgart | Peloponnisos |
| Yuzhen tsentralen | Karlsruhe | Attiki |
| **Czech Republic** | Freiburg | Voreio Aigaio |
| Praha | Tübingen | Notio Aigaio |
| Strední Cechy | Oberbayern | Kriti |
| Jihozápad | Niederbayern | **Hungary** |
| Severozápad | Oberpfalz | Közép-Magyarország |
| Severovýchod | Oberfranken | Dunántúl – Közép-Dunántúl |
| Jihovýchod | Mittelfranken | Dunántúl – Nyugat-Dunántúl |
| Strední Morava | Unterfranken | Dunántúl – Dél-Dunántúl |
| Moravskoslezsko | Schwaben | Észak-Magyarország |
| **Denmark** | Berlin | Észak-Alföld |
| Hovedstaden | Bremen | Alföld és Észak – Dél-Alföld |
| Sjælland | Hamburg | **Iceland** |
| Syddanmark | Darmstadt | Island |
| Midtjylland | Gießen | |
| Nordjylland | Kassel | |

**Table 6.** Continued

**Ireland**
Border, Midland and Western
Southern and Eastern
**Italy**
Piemonte
Valle d'Aosta/Vallée d'Aoste
Liguria
Lombardia
Abruzzo
Molise
Campania
Puglia
Basilicata
Calabria
Sicilia
Sardegna
**Latvia**
Latvija
**Lithuania**
Lietuva
**Luxembourg**
Luxembourg
**Malta**
Malta
**Netherlands**
Groningen
Friesland (NL)
Drenthe
Overijssel
Gelderland
Utrecht
Noord-Holland
Zuid-Holland
Zeeland
Noord-Brabant
Limburg (NL)
**Poland**
Lódzkie
Mazowieckie
Malopolskie
Slaskie
Lubelskie
Podkarpackie
Swietokrzyskie
Podlaskie
Wielkopolskie
Zachodniopomorskie
Lubuskie
Dolnoslaskie
Opolskie
Kujawsko-Pomorskie
Warminsko-Mazurskie
Pomorskie

**Portugal**
Norte
Algarve
Centro (PT)
Lisboa
Alentejo
**Romania**
Nord-Vest
Centru
Nord-Est
Sud-Est
Sud - Muntenia
Bucuresti - Ilfov
Sud-Vest Oltenia
Vest
**Slovakia**
Bratislavský kraj
Západné Slovensko
Stredné Slovensko
Východné Slovensko
**Slovenia**
Vzhodna Slovenija
Zahodna Slovenija
**Spain**
Galicia
Principado de Asturias
Cantabria
País Vasco
Comunidad Foral de Navarra
La Rioja
Aragón
Comunidad de Madrid
Castilla y León
Castilla-la Mancha
Extremadura
Cataluña
Comunidad Valenciana
Illes Balears
Andalucía
Región de Murcia
Ciudad Autonoma de Ceuta
Canarias (ES)
**Sweden**
Stockholm
Östra Mellansverige
Småland med öarna
Sydsverige
Västsverige
Norra Mellansverige
Mellersta Norrland
Övre Norrland
**Switzerland**
Région lémanique

Espace Mittelland
Nordwestschweiz
Zürich
Ostschweiz
Zentralschweiz
Ticino
**UK**
Tees Valley and Durham
Northumberland and Tyne and Wear
Cumbria
Greater Manchester
Lancashire
East Yorkshire and Northern Lincolnshire
North Yorkshire
South Yorkshire
West Yorkshire
Derbyshire and Nottinghamshire
Leicestershire, Rutland and Northamptonshire
Lincolnshire
Herefordshire, Worcestershire and Warwickshire
Shropshire and Staffordshire
West Midlands
East Anglia
Bedfordshire and Hertfordshire
Essex
Inner London
Outer London
Berkshire, Buckinghamshire and Oxfordshire
Surrey, East and West Sussex
Hampshire and Isle of Wight
Kent
Gloucestershire, Wiltshire and Bristol/Bath area
Dorset and Somerset
Cornwall and Isles of Scilly
Devon
West Wales and The Valleys
East Wales
Eastern Scotland
South Western Scotland
Highlands and Islands
Northern Ireland

# Appendix 4

**Table 7.** Tabellini sample

| Variable | Function 1 | | | Function 2 | | | Function 3 | | | Com. Coef |
|---|---|---|---|---|---|---|---|---|---|---|
| | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | |
| Trust | 0,450 | 0,653 | 42,61% | -0,042 | -0,025 | 0,06% | -0,315 | -0,060 | 0,36% | 43,03% |
| Importance of work | -0,421 | -0,549 | 30,17% | -0,195 | 0,385 | 14,81% | 0,412 | 0,322 | 10,34% | 55,32% |
| Job security | -0,242 | 0,195 | 3,79% | -0,833 | -0,640 | 41,00% | 0,071 | 0,304 | 9,26% | 54,05% |
| Job initiative | 0,505 | 0,614 | 37,65% | 0,501 | 0,331 | 10,96% | 0,116 | -0,039 | 0,15% | 48,76% |
| Job achieve | -0,040 | 0,309 | 9,52% | 0,008 | -0,013 | 0,02% | -0,036 | -0,292 | 8,53% | 18,07% |
| Children obedience | -0,047 | -0,124 | 1,54% | 0,336 | 0,038 | 0,14% | -0,223 | -0,711 | 50,54% | 52,22% |
| Children independence | 0,232 | 0,494 | 24,37% | 0,123 | -0,268 | 7,17% | 0,192 | 0,521 | 27,14% | 58,68% |
| Children hard work | -0,098 | -0,441 | 19,45% | 0,184 | 0,138 | 1,91% | -0,497 | -0,630 | 39,63% | 60,99% |
| Children imagination | 0,177 | 0,520 | 27,02% | -0,094 | -0,319 | 10,18% | 0,058 | 0,132 | 1,75% | 38,94% |
| Children tolerance | 0,049 | 0,040 | 0,16% | -0,259 | 0,236 | 5,58% | -0,298 | -0,191 | 3,63% | 9,37% |
| Children determination | -0,149 | 0,217 | 4,69% | 0,515 | 0,281 | 7,92% | 0,000 | 0,237 | 5,62% | 18,22% |
| Children responsibility | 0,066 | -0,007 | 0,00% | 0,462 | 0,229 | 5,26% | 0,251 | 0,738 | 54,49% | 59,76% |
| | | | | | | | | | | |
| Unemployment | -0,139 | -0,643 | 41,29% | 0,374 | 0,042 | 0,18% | 1,211 | 0,765 | 58,52% | 100,00% |
| Male participation | 0,493 | 0,770 | 59,27% | 1,066 | -0,629 | 39,60% | 0,473 | -0,106 | 1,13% | 100,00% |
| Worked hours | -0,638 | -0,832 | 69,26% | 0,697 | -0,496 | 24,56% | -0,497 | -0,249 | 6,19% | 100,00% |

| Canonical correlation coefficients | | | Sq. Canonical correlation coefficients | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 1 | 2 | 3 |
| **0,758** | **0,575** | **0,483** | **0,574** | **0,331** | **0,233** |
| *** | *** | *** | | | |

**Table 8.** Regions, work ethics & economic outcomes, Western Europe

| Variable | Function 1 | | | Function 2 | | | Function 3 | | | Com. Coef |
|---|---|---|---|---|---|---|---|---|---|---|
| | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | Std. Coef | Str. Coef | Str. Coef^2 | |
| Trust | 0,481 | 0,757 | 57,27% | -0,107 | -0,194 | 3,76% | -0,121 | 0,023 | 0,05% | 61,09% |
| Importance of work | -0,314 | -0,520 | 27,06% | -0,018 | 0,131 | 1,71% | 0,280 | 0,295 | 8,67% | 37,44% |
| Job security | -0,135 | 0,007 | 0,00% | -0,543 | -0,658 | 43,30% | 0,304 | 0,005 | 0,00% | 43,30% |
| Job initiative | 0,444 | 0,535 | 28,60% | 0,521 | 0,182 | 3,32% | 0,326 | -0,179 | 3,20% | 35,11% |
| Job achieve | -0,157 | 0,250 | 6,27% | -0,229 | -0,067 | 0,44% | -0,694 | -0,581 | 33,76% | 40,46% |
| Children obedience | -0,025 | -0,160 | 2,55% | 0,444 | 0,422 | 17,77% | -0,147 | -0,569 | 32,32% | 52,64% |
| Children independence | 0,279 | 0,524 | 27,46% | -0,077 | -0,537 | 28,85% | -0,206 | 0,251 | 6,28% | 62,58% |
| Children hard work | 0,184 | -0,300 | 8,97% | 0,523 | 0,488 | 23,81% | 0,127 | -0,353 | 12,45% | 45,23% |
| Children imagination | 0,157 | 0,591 | 34,92% | 0,056 | -0,305 | 9,31% | 0,419 | 0,215 | 4,63% | 48,85% |
| Children tolerance | 0,201 | 0,409 | 16,71% | 0,203 | 0,363 | 13,16% | 0,235 | 0,158 | 2,49% | 32,35% |
| Children determination | -0,147 | -0,032 | 0,10% | 0,229 | -0,010 | 0,01% | 0,099 | 0,242 | 5,84% | 5,95% |
| Children responsibility | 0,027 | 0,030 | 0,09% | 0,417 | -0,058 | 0,34% | 0,553 | 0,788 | 62,03% | 62,46% |
| Unemployment | -0,278 | -0,694 | 48,14% | 0,579 | 0,015 | 0,02% | 1,134 | 0,420 | 17,64% | 65,80% |
| Male participation | 0,267 | 0,611 | 37,36% | 1,196 | -0,755 | 57,06% | 0,282 | -0,236 | 5,57% | 99,99% |
| Worked hours | -0,726 | -0,888 | 78,84% | 0,371 | -0,284 | 8,04% | -0,692 | -0,362 | 13,12% | 100,00% |

| Canonical correlation coefficients | | | | Sq. Canonical correlation coefficients | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | | 1 | 2 | 3 |
| 0,744 | 0,442 | 0,335 | | 0,553 | 0,195 | 0,112 |
| *** | *** | ** | | | | |

# Appendix 5

**Table 9.** Regression with average unemployment as dependent variable and trust as explanatory

| Variable | Least Squares 1 Coef | Least Squares 2 Coef | Least Squares 3 Coef | IV 1 Coef | IV 2 Coef | IV 3 Coef |
|---|---|---|---|---|---|---|
| Trust | -0,43 | -0,05 | -0,43 | -0,34 | -0,32 | -0,31 |
| Std. dev | (0,13)*** | (0,15)*** | (0,14)*** | (0,18)* | (0,16)** | (0,14)** |
| Austria | -6,05 | | -6,05 | -2,04 | | -1,92 |
| Belgium | -2,73 | 2,02 | -2,73 | 0,85 | 0,93 | 1,02 |
| Bulgaria | 1,74 | | | -0,18 | | |
| Czech Repub | -3,6 | | | -1,6 | | |
| Denmark | -5,07 | | -5,07 | 10,6 | | 9,58 |
| Estonia | -2,17 | | | 0,8 | | |
| Finland | omitted | | omitted | 12,5 | | 11,8 |
| France | -2,44 | 2,25 | -2,45 | -1,73 | -1,52 | -1,28 |
| Germany | -1,34 | 3,46 | -1,34 | 4,34 | 4,32 | 4,3 |
| Greece | -0,99 | | -1,003 | -1,9 | | -1,3 |
| Hungary | -3,99 | | | -4,85 | | |
| Iceland | -6,79 | | -6,79 | 1,43 | | 1,13 |
| Ireland | -5,52 | | -5,52 | -0,72 | | -0,68 |
| Italy | 0 | 5,13 | 0 | 2,55 | 3,14 | 2,82 |
| Latvia | -1,3 | | | -0,46 | | |
| Lithuania | -0,92 | | | 0,84 | | |
| Luxembourg | -6,64 | | -6,7 | -4,4 | | -4,11 |
| Malta | -4,04 | | -4,05 | -4,46 | | -3,9 |
| Netherlands | -5,7 | -0,76 | -5,7 | 6,07 | 5,77 | 5,43 |
| Poland | 5,34 | | | 6,48 | | |
| Portugal | -4,64 | omitted | -4,65 | -6,55 | -6,22 | -5,85 |
| Romania | -3,18 | | | -5,99 | | |
| Slovakia | 3,22 | | | 0,57 | | |
| Slovenia | -5,22 | | | -4,72 | | |
| Spain | -0,57 | 4,19 | -0,57 | 3,28 | 3,35 | 3,42 |
| Sweden | -2,75 | | -2,75 | 9,95 | | 9,23 |
| Switzerland | -5,9 | | -5,89 | 3,17 | | 2,8 |
| UK | -5,28 | -0,48 | -5,28 | omitted | omitted | omitted |
| Observations | 248 | 145 | 194 | 248 | 145 | 194 |
| Adjusted R$^2$ | 0,57 | 0,36 | 0,42 | | | |

*** 99% significance, ** 95% significance, * 90% significance

1 Sample with 28 European countries

2 Tabellini sample

3 Western Europe