AN EMPRIRICAL APPROACH TO TRUST AND GROWTH IN THE EUROPEAN COUNTRIES

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Abstract

Trust problems due to the international financial crisis originated by the "subprime" mortgages, raised the importance of a subject that became common to the economic growth models, since the end of the XX century. This work presents an approach to the concept of "trust" and its implications to the economic growth. In order to accomplish this goal it is developed a principal components analysis in order to reduce the dimensions of the variable and thus incorporate it in a growth model through a "proxy" variable. The analysis uses 13 EU countries with available data since 1980 to 1999, proposing a growth model that allows the analysis of the human capital and social capital effect in the european economies under analysis.

Keywords: trust, social capital, human capital, growth

JEL Codes:

1.Introduction

The international economic crisis unleashed by the “subprime” mortgages has been named as a “trust crisis”. This crisis has taken to public domain an issue recently introduced in economic research, that is social capital. Under these acronyms economists have tried to go a step further in explaining economic growth. The economic literature had devoted three decades to try to demonstrate that education, not only determines the salary of the recipient, but also contributes to the development of society as a whole. But there is something else that affects growth, it is social capital. What is it and what is its relation with education and the economy? With the help of economic models, economists have tried to quantify what sometimes sociology, psychology and common sense itself indicate, that is, we have shown that participatory societies in which its members are part of associations, trust in their institutions and, ultimately, have a society more caring or committed with other’s wellbeing, more productive and with higher economic growth.

The main indicator used is trust, which can be divided in two ways, on the one hand trust in others and the other trust in political institutions. Strong institutions, with clear standards and rules that are well known, generate confidence in society as a whole. The opacity of institutions and the loss of confidence in them, along with more educated and critic citizens, leads to a general loss of confidence, which in the case of the international financial crisis means that banks distrust each other to lend to each other, as well as citizens and banks mutually distrusting each other.

What is the solution? Obviously rebuild trust. This issue is not simple, but there are a number of factors can contribute. If we inspire public confidence in their political leaders, maybe we can generate greater generalized trust, which leads to generate mutual trust between savers, financial institutions and companies that need credit.

The aim of this paper is to analyze the factors that have conditioned the economic growth in Europe over the last two decades trying to shed further light on the relationship between different dimensions of trust

2. Economic growth, models and proxies

Since early work on economic growth, the problem of quantifying human capital, has emerged as one of the biggest barriers to cross. In order to shed light on this question, this section is a brief review of the literature of economic growth and the problems presented in the use of proxies for different types of capital.

2.1. The problem of quantifying

As mentioned above, the quantification of human capital since its inception was the basic handicap in the implementation of empirical models. Since its inclusion as a productive factor in the work of Shultz (1963) and Becker (1964), the database used and the variables used to measure it became the cornerstones for its development.

In the first models there were problems of quantifying the human capital variable (H), and was included as proxy a flow variable number of years of schooling, enrollment rates, and in some works the population's years of study. The work of Barro and Lee in the early nineties created a new database on human capital stock relaunching empirical studies on the subject and presented the human capital variable as significant in a wide number of works.

Relationship between Physical, Human and Social Capital

The problems of quantification of human capital, are even more obvious when we speak of social capital. Thus, Table 1 shows a comparison of the latter with other forms of capital, observing the deepening problems of measurement that other types of capital have been facing

Table 1
A Comparative Analysis of Social Capital and other forms of Capital (Physical And Human Capital)

SIMILILARITIES
It is a resource in which it is possible to invest in order to obtain future benefits
It is a substitute and a complement to the other types of capital
It is depreciable
It is adaptable
It may be transformed into other forms of capital
It expresses a relationship
DIFFERENCES
It is more difficult to perceive and to measure than other types
It is more difficult to construct by means of external investment

Source: Neira, Vázquez y Portela (2009)

Social capital has begun to be introduced in economic models of growth as an important variable, for a detailed analysis see Neira Vasquez and Portela (2009). Nevertheless, there are many authors considering that it cannot be considered a form of capital, the same

criticism which also took place in the process of creating the proxies of human and physical capital.

Table 2

Critiques of the concept of Social Capital

CRITIQUE	ANSWER
ARROW: Social capital does not require deliberate sacrifice in the present for future human benefit (one of the three normally accepted features of capital)	Human capital also lacks certain aspects of more traditional capital, but is now, unequivocally considered to be a form of capital
SOLOW: Social capital is a bad analogy. There is no stock of social capital and even if there were, how would it be measured?	There is indeed a stock of social capital and it must be measured using proxies since there is no direct measure of the weight of social capital.
The concept is based on an outmoded concept; the style varies but not the substance	The concept is well established but has served to focus attention on the importance of social relationships and how these stimulate development.
The mechanism by which social capital is said to operate is often conceived of as one of direct cause and effect.	This is a misconception. Networks and norms contribute to development, but are never sufficient on their own and only act in combination with a number of other elements.

Source: Neira, Vázquez y Portela (2009)

In spite of these criticisms the concept of social capital remains valid, although both the definition and the framework in which it is studied require further refinements

2.2. A literature Surrey

The economic literature on the subjects of human and social capital has grown exponentially, yet there are still few econometric work which collect both factors in relation to economic growth

Human Capital

There are two fundamental kinds of econometric models that attempt to describe the relationship between human capital and economic growth. The revision of these models can be seen in Neira and Guisan(2002), Neira(2003), and Guisan, M.C., and Neira, I. (2006 a,b). Initially used by Barro (1991, 2001) and Mankiew, Romer and Weill (1992), and Noneman and Vanhoudt (1996) includes human capital as an explanatory variable within the production function in order to study how variations in this kind of capital affect the rate of economic growth. In the second kind of model, human capital does not exert a direct influence on growth, but acts indirectly by augmenting the accumulation of technology. These models are analysed by Romer (1990), Kyriacou (1991), and Benhabid and Spiegel (1994). Some of these works - Romer (1990), Benhabid and Spiegel (1994), and Barro (2001) go further by suggesting that there is a relationship between physical and human capital, in the sense that human capital might contribute to the accumulation of R+D and, in so doing, contribute to economic growth.

Social capital

In most of the studies that look at social capital, one of the main variables used is Trust (Knack and Keefer, 1997; Whitely, 2000; Beugelsdijk and Schaik, 2005; Helliwell 1996). The variable usually includes different types of trust or confidence, ranging from confidence in members of the family, neighbours, the people of one's country, etc. A second commonly included variable is one that measures the participation in different associations in an attempt to measure the social integration of the members of the community being analysed (Helliwell, 1996; Berger-Schmitt, 2002; Knack and Keefer, 1997; and Beugelsdijk and Schaik, 2005). In addition to these two variables, others are often included such as levels of corruption, democracy, crime rates, divorce, levels of unemployment, etc. All of these indicators attempt to glean some kind of evaluation of social capital, and since it is multidimensional by nature, this evaluation remains difficult, but not impossible. Guisan(2009) presents an econometric model which relates Trust with an indicator of the educational level and two indicators of quality of Government (Voice of Citizens and Government Efficiency), finding positive and significant effects of the explanatory variables in a sample of 36 Countries members of Council of Europe (including Europe and Eurasia), the United States and Canada. This author found positive correlations of Social Trust with the real GDP per capita, past Expenditure on Education, and the indicators of Quality of Government.

3. Principal Components Analysis

The analysis developed in the previous section allows the conclusion of a degree of unanimity in the use of proxies of human capital: number of years of schooling of the labor force, or the percentage of workforce with higher education to secondary level. This fact is not so clear in the social capital and membership in groups or levels of trust have been formed as the variables most used in literature

In this work we performed principal components analysis with the aim of reducing the size of the number of variables used in this quantification.

Data from World Values Surveys (WVS) provides information relevant to a wide range of cultural, political and social areas. The survey provides answers to questions arising in the fields of social relations, politics and technology. The survey reveals how certain criteria impact upon the society i.e. the groups and associations to which individuals belong, religious beliefs and behaviour, attitudes with respect to certain kinds of behaviour, employment, the national and world economy, confidence in various types of civil organisation etc. It also includes demographic information relevant to household incomes, the number of residents in each household, age, sex, social class, political affiliation etc of those interviewed.

This work uses the four surveys available in World Value Surveys (WVS) (1981, 1990, 1995 and 1999)[1]. The accumulation of individual frequencies was used to obtain an

[1] The survey from the year 2005 has certain gaps in the data for the countries and the variables analyzed, which is why it is included in the principal components analysis

aggregate value for each country for certain values analyzed in the survey [2]. This data reflects the percentage of individuals from each country that feel that the following are important or trust them: generalized (TRUST)[3], the armed forces (ARME), the legal system (LEGAL), the police (POL), parliament (PAL), public administration (CIVIC) and belonging to groups (GROUP).

Tabla 3

	ARME	CIV	GRUP	LEG	PAL	POL	TRUST
ARME	1,000	0,268	0,022	0,250	0,028	0,608	0,300
CIV	0,268	1,000	0,109	0,421	0,490	0,526	0,300
GRUP	0,022	0,109	1,000	0,431	0,008	0,424	0,698
LEG	0,250	0,421	0,431	1,000	0,283	0,711	0,635
PAL	0,028	0,490	0,008	0,283	1,000	0,036	0,134
POL	0,608	0,526	0,424	0,711	0,036	1,000	0,745
TRUST	0,300	0,300	0,698	0,635	0,134	0,745	1,000

The analysis of the variables of confidence indicates the presence of important relationships between two of the most used proxies, Group and Trust (Table 3), this result indicates that the proxies used in measurements can be summarized in a single component, synthesizing the role that trust in people and voluntary associations have on the economy, thus eliminating the problem of multicollinearity in econometric research, which leads to loss of significance of both variables when used together.

Tabla 4. Principal component analysis

	Component		
	1	2	3
ARME	,019	,934	,038
CIV	,144	,320	,638
GRUP	,983	-,053	-,039
LEG	,537	,379	,464
AL	,004	-,106	,954
POL	,515	,746	,189
TRUST	,791	,370	,198

Using the data given in Table 4, three components may be interpreted as dimensions of social capital. The first of these explains 46.71% of the total variance which is positively correlated, fundamentally with the traditional measures of social capital (TRUST and

[2] Austria, Belgium, Denmark, Spain, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, and The United Kingdom. This choice was determined, to some extent, by the availability of data with respect to some of the proxy variables such as those that analyse social capital

[3] The reply obtained from the WVS to the question; "Generally speaking, would you say that most people can be trusted?"

GROUP). This result indicates that the proxies utilized in the measurement process may be drawn together into one component which reflects the way and the extent to which confidence in individuals and belonging to voluntary associations affects the economy.

The following authors all study the way in which "trust" or being a member of a group, when used as proxies for social capital, are related to a greater or lesser extent, to economic growth; Knack and Keefer, 1997; La Porta et al., 1999; Whiteley, 2000; Beugelsdijk and van Schaik, 2001. The second component reveals the extent to which people confide in the forces of law and order (the army and police). This dimension is different from the next component analyzed which is made up of the "civic" and "parliament" variables, and represents how much the population trusts the public administration and parliament In his analysis, Farole (2007) uses an econometric study to measure general confidence and confidence in governmental institutions among others. These variables are explained in terms of "associationism" (on three levels). Overall, these findings support the Putnam thesis that 'membership matters' (Farole, Rodriguez-Pose, & Storper, 2007, pp. 22).

Thus the first component reflects horizontal or generalized confidence, which complements group membership. Group is considered to be a force capable of dynamizing generalized confidence in social capital theories. According to the criteria used in this study this constitutes the, "synthetic indicator" for social capital since it is built using the two variables that are included in the literature as measurement variables, and with the added advantage that they are united within one variable. (Component 1)

The two remaining components confirm the theories of Putnam, although there is certainly a correlation among the variables, the components analysis facilitates the differentiation between horizontal confidence (first component) from the vertical component, which is divided into two, taking in the difference between, that which from the citizens' point of view, might represent the most "bureaucratic" part of the state (third component) and the part which ensures that the laws are upheld (second component).

3. Econometric Analysis.

In this section we present a model of economic growth, in line with those discussed in the literature survey. The main asset of the model is the inclusion of a new variable as a synthetic indicator reflecting social capital in a single dimension, combining trust variables and groups, performing a comparative analysis with the results of the variables separately.

The countries chosen for analysis were as follows: Germany, Austria, Belgium, Denmark, Spain, Finland, France, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, and The United Kingdom. This choice was determined, to some extent, by the availability of data with respect to some of the proxy variables such as those that analyse social capital.

Variables

RGDPCH: Real GDP per capita. This data comes from the Penn Word Tables and is quantified in constant U.S. $ prices (year 2000).

KI: Investment as a proportion of per capita GDP. This data also comes from the Penn World Tables and is quantified as a percentage of RGDPL constant prices (year 2000).

TRUST: This is the variable that is used to quantify the effects of social capital. It represents the percentage of people that respond in the affirmative to the first part of the following question: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? The data comes from the study; World Value Surveys, which was made up of four surveys.

GROUP: This variable constitutes a further tool for measuring social capital and takes in the percentage of people who are either active or inactive members of some of the types of association listed in World Values Surveys.

PS2: This is the variable that was used to quantify the country's human capital. The indicator represents the percentage of the population, aged 25 to 64, which have completed secondary school or better. The data was obtained from the base that was created for the analysis.

COMPONENT: Principal component analysis.

Thus, the model presented in this paper is given in the following equation:

$$\log(RGDPCH)_{it} = \beta_{0i} + \beta_1 PS2_{it} + \beta_2 KI_{it} + \beta_3 TRUST_{it} + \beta_4 GROUP_{it} + \beta_5 COMPONENT + \varepsilon_{it}$$

Table 5

	Fixed effects (cross)		
Variable	Pooled EGLS		
Constant	8.55(0.00)	8.63(0.00)	8.50(0.01)
KI	0.020(0.00)	0.020(0.00)	0.016(0.004)
PS2	0.013(0.00)	0.011(0.00)	0.014(0.00)
COMPONENT			0.003(0.00)
CONF	0.002(0.09)		
GROUP		0.002(0.00)	
GE	-0.23	-0.21	-0.24
OS	-0.06	-0.05	-0.07
BE	0.16	0.12	0.17
DE	0.26	0.27	0.38
SP	-0.07	-0.10	-0.02
FI	-0.05	-0.06	-0.00
FR	0.11	0.11	0.06
NE	-0.14	-0.13	-0.11
IR	-0.07	-0.07	-0.21
IT	0.19	0.17	0.24
NO	0.06	0.11	0.07
PO	-0.17	-0.23	
UK	0.02	0.07	-0.03
SW	0.01	0.02	-0.02
R-sq adj.	0.98	0.99	0.92

The p-value or the marginal significance level is given in brackets

The results of the fixed effects equation indicate that all the variables are significant in explaining GDP growth and that both the values for the coefficients of physical capital and human capital variables stand out.

It is also noteworthy that the social capital variables are seen to have a positive impact on economic growth in European countries, fulfilling the hypothesis on which this study is based. TRUST and CONF obtain similar coefficients, both of which are lower than for that of human capital in the works analysed in section 4.

Withely (2000) obtained similar results for 34 countries in the World Values Survey. The most significant differences between this work and those previously analysed, reside in the fact that the former uses a single, more homogenous sample, and in that panel data techniques were used. Econometrically, therefore, these results were more robust.

The problems of multicolinearity derived from the inclusion of the variables Trust and Group, take to consider the inclusion of the First Component like an indicator "Proxy" of the social capital. The considered coefficient is significant and greater than Trust and Grroup, corroborating therefore the idea that the combination of the generalized confidence and the property to groups they would have to be considered of a way to measure social capital.

4. Conclusions

The quantification of social capital presents itself as one of the challenges which researchers in this field face today. The results of principal component analysis allows us to move towards a synthetic indicator which may consider its various dimensions.

The analysis involves the differentiation of two types of "trust", as reflected in the literature, so that we can speak of horizontal trust, or generalized trust in people and vertical trust, or institutions

The analysis which has been carried out has allowed the European countries to be divided into three groups with respect to Generalized Trust. The Scandinavian countries have high levels of generalized confidence, the Mediterranean countries comparatively low levels, while Central Europe comes somewhere between the two

The results of the econometric estimations indicate a significant positive effect of human and social capital in the growth of European economies over the past two decades. This result corroborates the theories developed in both lines of research, emphasizing two of the factors that should be looked at through the implementation of political and economic measures to ensure its proper development.

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