"Social Capital and Economic Growth"

-An empirical study of the importance of social capital for a country's economic growth in the South and North America region"

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Abstract

The conversation about whether social capital has an implication on the growth of a country, has received increasing attention by economists in recent years. Research is now diverging from the belief that growth can only be explained by the traditional outputs such as capital, labor and natural resources. This paper analyzes the relationship between social capital, economic performance and the development of a country. Analysis is performed using a panel data model from 11 countries in South and North America from the time period 1994 to 2014. The econometric model in this paper uses panel data due to the more efficient estimators yield compare to cross-sectional or times series data. A positive relationship was found on the impact of social capital explaining the economic growth of the countries analyzed which is in line with previous empirical studies. The most robust results were found by using the FGLS model. The findings, suggest that the impact that social capital has on economic growth should not be overlook by policy makers since it can help increase the development of a country.

Keywords: Social Capital – North America and South America- Economic Growth- -panel data

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1. Introduction

Extensive research has been conducted since the beginning of economics trying to explain the development of countries and how to achieve economic prosperity. Several determinants have been the focus of these studies. The classical view on economic growth leans towards capital and labor as main factors affecting the level of development within a nation as stated by Solow (1957). Since then, much attention has been given to the study of how capital affects economic growth. At the begging of the 1970's economists started looking at innovation, research and education as the main determinants affecting capital formation and their relationship with the development of a country. (Bilbao et al. 2004). Although there are other variables with the potential to have an influence in economic growth, a new line of study tries to explain all the other hidden factors for why a nation with similar endowments has developed faster than others. Researchers have overlooked the social impact of social organizations, institutions, networks, trust and cooperation between individuals to explain these differences and it is here where the concept of Social capital falls under.

Social capital promotes economic growth by stressing the importance of cooperation and trust within institutions, companies and the state, as well as between individuals. The collaboration amongst individuals is essential to maximize social welfare. Social capital operates as an internal commitment instrument to solve the social dilemma for collective action of free-riding and self-interest (Christoforou, 2003).

Different empirical studies on social capital attribute the variation between regions and countries and the level of economic and social development to the stock of social capital. Positive correlation has been found between the stock of social capital in a region or a country and its economic performance (Neira et al, 2008; Helliwell, 1996; Helliwell and Putnam 1999, 2000; Knack and Keefer, 1997; Krishna and Uphoff, 1999; Pereiro and Tortosa, 2015). A higher stock of social capital meant a higher level of economic growth. These studies suggest that a higher collaboration between individuals not only encourages achieving a common goal, but reduces transaction costs and therefore a higher economic growth is accomplished by increased output.

However, there has been an empirical study disproving the fact that social capital has no significant impact on the economic growth of a country, like the study presented by Casey and Christ (2002). The empirical study carried out made a comparison with the study of Putnam (1995) for different regions in The United States of America but used a different measure for social capital.

This paper will attempt to measure to what extent social capital impacts the economic growth for some of the South and North American countries. The Analysis will be carried out by using data from the World Values Survey (WVS) in a panel data study of 11 countries from 1994-2014.

Therefore the study will be organized as followed. Section 2 will present different definitions of social capital. This will be followed by Section 3, which presents the different ways to quantify and measure social capital. Section 4 will discuss empirical evidence from different studies, analyzing the impact of social capital in economic growth at the country and regional level as well as the different variables used. Data and the econometric model used for this study are then presented in Section 5. Subsequently Section 6 will present the empirical results found with analytical discussion of the different estimators. The paper will conclude with the implications of the empirical results as well as some suggestions to increase social capital in the different regions and the potential impact that this one could have on the development of the countries.

2. Theoretical Background

2.1 What is social capital?

Social Capital is a relatively new line of study in economics. Although the concept of social capital is relevant for many disciplines, and has been around for decades, there is not a universal definition to describe it. Most Economists have used words such as trust, networks or shared actions to define what social capital is. The most recognized definitions among scholars are "anything that facilitates individual or collective action, generated by networks of relationships, reciprocity, trust and social norms." Coleman (1998, 2000). Putnam (1995) describes social capital as "those shared actions, trust and social organization that collectively derive mutual benefit". The World Bank 1998, refers to social capital as "the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions". In other words, social capital can be described as social norms and interaction amongst individual that promotes and facilitates the collaboration for the benefit of both parties.

Social capital like human capital or labor could be a very profitable investment for the future. However, social capital cannot produce economic growth on its own (Neira et al. 2008). Therefore it can be considered as a compliment or substitute for the other types of capital. The basis of why it should be considered as a substitute is because social capital, can replace the lack of access to financial capital by relying on the close relationship one may have with family members or friends. This can provide access to funds that otherwise would be limited or just simply impossible since, in the case of lower income household, they do not possess the necessary collateral asked by financial institutions. In the case of human capital, it can also serve as a substitute if there is a lack of knowledge. One can rely on the advice of a friend or someone in the community. When entering the job market it can help to get an opportunity due to a friendship and relationship aside from the skills one possesses. Another way individuals can benefit from these relationships it is simply by getting a better gain in their supplies due to the social ties (Woolcock, 2000).

Social capital uses the relationship amongst individuals as the primary focus but it is important to take into consideration the way communities are structured and their relationships with the state (Woolcock, 2000). The involvement, transparency and strong governments have a deep impact on the effect of community life and the development of projects, unlike governments presenting corruption, not honoring contracts, and failing to uphold the rule of law (Isham and Kaufmann, 1999).

But not all types of social capital have a positive effect on social efficiency and economic development. Fukuyama (2001) states:

> "… both the Ku Klux Klan and the Mafia achieve cooperative ends on the basis of shared norms, therefore have social capital, but they also produce abundant negative externalities for the larger society in which they are embedded".

Not only can social capital be detrimental when the cooperation between individuals harms the overall welfare of society but it also can damage the aspect of communal obligations. It creates self-sufficiency and isolationism which could ignore the importance of creating valuable and accountable formal institutions which in turn help the development of a country (Knack, 1999).

It remains unclear whether the quantity or the quality of social capital is more important for development and to what point both produce an optimum level. Higher quantity of social capital stock but a low quality can create a negative capital (Neira et al. 2008). On the other hand low quantity of social capital with high quality might not be enough to stimulate the necessary social networks and trust amongst society to produce a visible impact on economic performance. As stated by Woodcock (2000) "group loyalties may be so strong that they isolate their members from information about employment opportunities, foster a climate for ridicule towards efforts to study and work hard or siphon off hard-won assets".

3. Measuring social Capital

The previous section presented several empirical studies that have strived to quantify social capital and its impact to economic development. One of the main challenges for social capital in economic studies is the complexity in measuring it. Different approaches have been taken in order to develop a tool to precisely measure social capital and examine the within country and across country comparisons as well as the micro-level analysis. Surveys are the most common measure used in different studies to analyze cooperative norms, trust and social ties are surveys, (La Porta et al. 1997; Knack and Keefer, 1997; Whitely, 2000; Neira et al. 2008; Beugelsdijk and Schaik, 2001). Some issues have taken place when adding the values assigned to the countries. Countries with high family and ethnic ties will not represent the social trust as mentioned by Fukuyama (1995).

3.1 Survey-Based Measure

3.1.1 Membership

As mentioned in the empirical studies; one variable used to measure social capital is membership or participation rate in informal and formal associations, (Heliwell, 1996; Knack and Kefeer, 1997). Putnam (2000) tried to measure social capital by analyzing the civic engagement of the society in different activities or groups. Using a mixture of consensus and surveys, he analyzed how involved people were within their society measuring the size of memberships in sports clubs, bowling leagues and other kind of clubs.

The problem arising with measuring these kinds of memberships is that they can vary across time and across countries, by reasons the model will fail to detect. The norms of membership may differ between cultures, shaped by cultural or historical events. Also the different involvement might not be well documented in less developed countries where different sport associations might not have the resources or infrastructure to register all the people that are involved in these activities.

3.1.2 Trust

Another variable in most studies concerned with social capital is trust. This variable usually includes different types of trust or confidence ranging from confidence in members of the family, neighbors, and the people of one's country (Neira, 2008; Whitely, 2000). The firm believe that social trust is

determinant in economic growth was first develop by Arrow (1972). Later Fukuyama (1995) considered that the level of trust in a society is highly related with its economic performance. Nevertheless although this variable is one of the most used proxies to measure the cooperation amongst individuals, Putnam (1995) conveys this as a problem "since trust is so central to the theory of social capital, it would be desirable to have strong behavioral indicators of trends in social trust or misanthropy. I have discovered no such behavioral measures." So it leaves the question still open for discussion on whether or not this will remain as the best measure.

More variables have been used as proxies as an attempt to measure social capital such as levels of corruption, democracy, crime rates, divorcee, levels of unemployment (Babb, 2005; Putnam, 2000). All of these different indicators try to explain how the interaction between individuals can promote the development of a country. But it still remains difficult to evaluate social capital due to its complexity of the definition.

3.2 Measure of proxies for the Study

The following section contains an analysis of social capital in South and North America. The analysis was carried out using data from the WVS. The institution responsible for this survey is The Inter-University Consortium for Political and Social Research, directed by Ronald Inglehart. The countries selected for the study are found in this survey as well as other countries in Asia and Europe, but not all of them are presented in the different years or waves the survey was conducted. The surveys attempt to measure the attitudes, relevant groups, civic involvement and confidence in government institutions among other relevant information.

Following relevant work previously presented by other authors (Neira et al. 2008), this study used the proxy "trust" to measure social capital. The variable was contained in the question that stated: Generally speaking, would you say that most people can be trusted? The levels of trust display by the different countries in the time period 2010-2014 are exhibit in the following map. (Fig. 1)
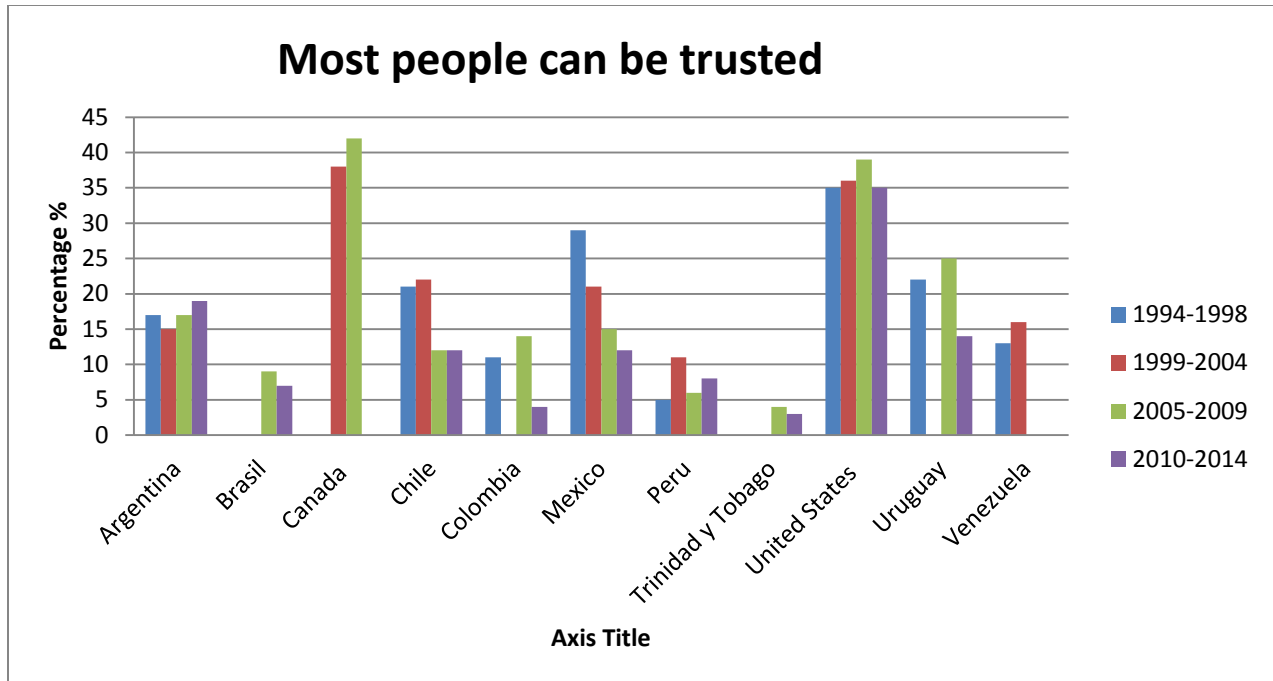
Fig 1. Trust in North and South America. Percentage of people that responded; people can be trusted. Source: own elaboration (based on data from WVS)

As it can be notice in the map, the countries that show the highest level of trust (or social capital) are the North American countries, in particular United States and Canada[1], in which nearly 40% of the respondents believe that people can be trusted. The countries that come in the second group are conform of Mexico, Argentina, Uruguay, Venezuela and Chile, between 12-29% of the population answered positively. Brazil, Colombia, Peru and Trinidad and Tobago come in the last group, being the set of countries with the lowest percentage when it comes to trust. It is important to note that trust decrease on the last time period measure for all the countries with the exception for Argentina.

The second variable used to measure social capital in the study was "membership" proxy. This variable determines the percentage of people who are members of at least one voluntary organization. And as it is shown in the map below (Fig 2)
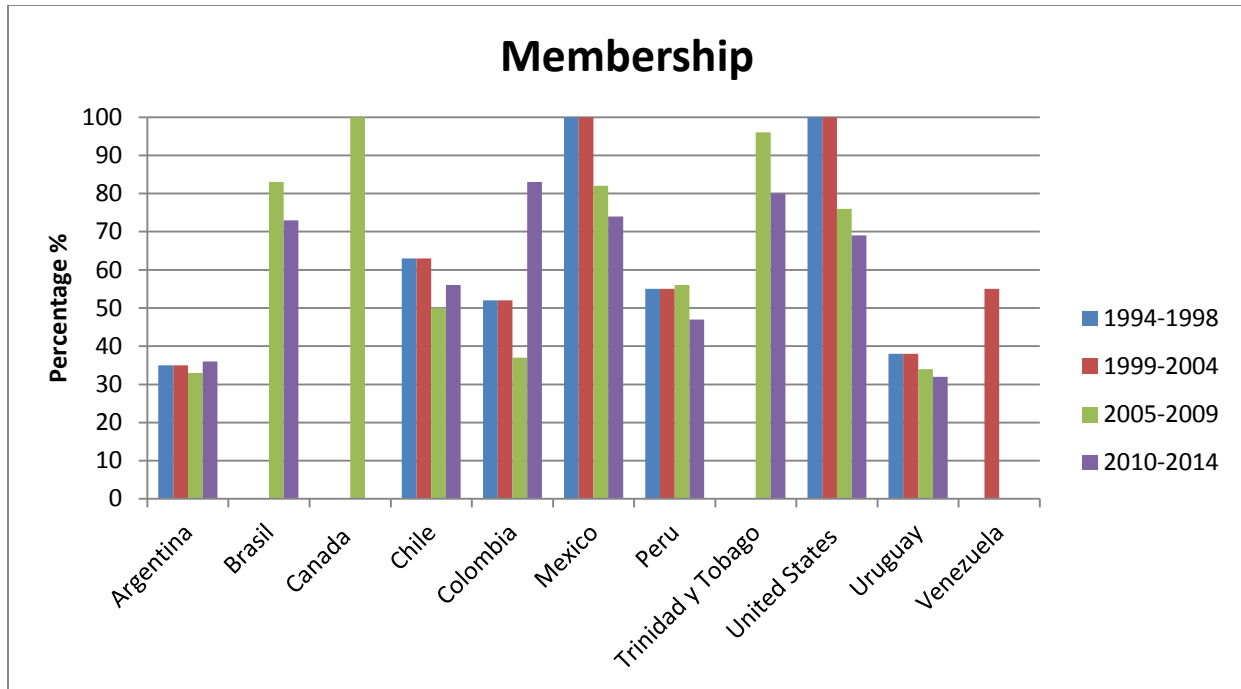
Fig 2. Membership in North and South America. Percentage of people that are members of at least one voluntary organization; Source: own elaboration (based on data from WVS)

The values here are similar to those found in the trust variables in the sense that the North American countries displayed the highest percentage of people that are members of at least one voluntary organization. Also the membership has been decreasing over time for this set of countries. For the South America region, the behavior does not follow any particular pattern. The South American countries display a decrease in membership in most of the countries, but this is not the case for Colombia which shows a significant increase over the last period.

4. Empirical Evidence

Social capital can affect economic performance through different channels. As described above, social ties and interpersonal trust can help reduce transaction costs, thereby assisting in obtaining contracts and accelerating the processes, since there is a relationship already established. In some cases it also facilitates access to financial credit that otherwise would not have been possible. The other variables commonly used are the civil engagement and social cohesion. The importance for this kind of measure for social capital is that it helps to emphasize the honesty of governments, how people trust the institutions as well as creating more competition by eradicating lobbyism (Knack and Keefer, 1997). This section will present different examples on studies that have attempted to measure the impact of social capital in economic growth.

4.1 Cross-Section Studies

In his study Fukuyama (1995) uses the variable trust as a measurement of social capital in order to explain the cross national differences in economic performance. Fukuyama suggests that if the trust between individuals does not extend beyond the family ties, the supply of capital and of qualified personnel is limited, hampering the scale of private firms. Furthermore he continues to point out that societies with a higher social capital stock tend to be more efficient implementing new technological changes and other organizational innovations. Fukuyamas' empirical evidence is more qualitative than quantitative and he classifies the countries studied with high or low trust levels according to their economic performance.

Another study that has served as a pillar in the social capital discussion is the one from Putnam and Heliwell (1995) in which they tried to explain the difference in economic performance in Italian regions that have similar endowments. The main focus of the study is to see what factors affect the difference in growth for the south compared to the north, taking into account the differences among both regions, but considering social capital as a main focus. The authors used three different measurements. A survey was conducted to reveal the level of satisfaction from the people with the current government, a measurement of the extent of civic community, a measurement of direct effectiveness of regional government. The dependent variable used was per capita GDP and explanatory variables such as political and civic behavior and citizen satisfaction. They found that

there was a positive correlation that convergence is faster and higher incomes in regions where social capital was high. The relationship could be explained by the efficiency of the government on implementing different policies as well as the cooperation between the inhabitants in order to achieve a common goal. Ultimately these two answers resulted in inhabitants being "better off".

Knack and Keefer (1997) used data from the World Values Surveys to conduct their studies and prove the impact of social capital. These surveys polled roughly 1,000 respondents in each of several dozen developed countries and were conducted first in 1980's. During the 1990's a second wave of surveys was conducted but this time it included a wider range of countries. The purpose of these surveys was to have a national representation of the level of trust among citizens as well as between citizens and its' governments. La Porta (1997); Knack and Keefer (1997) reflect that trust is connected to better rating of government corruption and efficiency as well as infrastructure in a country. Knack and Keefer (1997) used a sample of 29 countries. The variables used to control the economic growth was the percentage of primary and secondary school attainment in the total population or what we come to know today as human capital. The dependent variable is GDP growth from 1980-1992 and the proxies for social capital are civic trust and members of a group. The analysis showed a positive and significant relationship for economic growth with respect to the trust variable. For the membership variable the results were non-significant.

4.2 Panel Data

In the study carried out by Neira et al. (2008), they look at different European countries during the time periods of 1980-2000. The variable used by the authors for measuring social capital was social trust due to that it has shown to reduce the cost of doing business and facilitates information. Their aim was to analyze the degree of social confidence. Another variable used was the membership variable. This variable measures if people belong to any kind of voluntary organization in order to identify the community cohesion. They used panel data from the World Value Surveys within different European countries belonging to the OECD. The econometrics model used was OLS and fixed effects to control for differences amongst countries. The dependent variables were GDP/Capita and some of the independent variables alongside with the proxies for social capital, were investment per capita and human capital. The main finding showed a relationship between social capital and economic growth independently of the variable used for social capital. The

importance of this study is that it was one of the first ones to look at panel data in order to look at the impact that social capital had in economic growth.

In summary, most studies conducted with multilevel methods using the different proxies found measures of social capital on the individual-level to be considerably related to economic growth of the regions or countries. Results regarding the effect of social capital with panel data Neira et al. (2008),found that using the different proxies for social capital as well as the other kinds of capital (physical and human capital) has a positive impact on the economic growth of the European countries. Although most studies have attempted to capture social capital with different approaches, it still remains at an infancy stage on how to quantify social capital.

Due to the positive impact of social capital on economic growth found in previous studies, this papers will attempt to recreate the impact that social capital has in explaining economic growth. What makes this study unique is the selection of the countries in the South and North American regions, and along with Canada and the U.S.A. These economies share, to a certain extent, the same cultural values due to their history of colonization and independency in the 18th and 19th century. Further, this study will try to clarify which kind of capital has the most impact when explaining why some regions have developed at a faster pace.

5. Econometric Model of Social Capital and Economic Growth

This section describes an econometric model that analyses the impact of social capital on economic growth measured in terms of real GDP. The purpose for this study is to see to what extent social capital influences the development of a country and whether or not it is as important as the other types of capital that are continuously used to measure the economic growth of a country just like the study carried out by Neira et al. (2008). Although the measurement and quantification of social capital still remains at an early stage, the variables chosen as proxies for social capital were "TRUST" and "GROUP MEMBERSHIP" in order to determine the involvement of the society. The reason these variables were chosen like in previous studies was because they are the most representative parameters on how people are associated with one another.

A different set of countries were selected compared to the previous analysis mention above. The countries selected were as follows: Argentina, Brazil, Canada, Chile, Colombia, Mexico, Peru, United States, Trinidad y Tobago, Uruguay and Venezuela. The choice of these nations was made due to the availability of the data presented in the WVS for the proxies used. Also it was made partly because a study of this magnitude has yet to examine developing economies in the North and South American regions. The time periods analyzed were from 1996, 2001, 2006, and 2011 , since this were some of the years supplied by the World Value Surveys (WVS),as well as the Penn World tables (PWT 8.1).

5.1 Panel Data

Since the data used did not carry the surveys for all the countries selected for the different time periods, a pool-unbalanced equation was used as some regional data was missing. An important advantage of panel data, over cross-sectional data sets, is that they allowed the identification of specific parameter or questions, without the necessity to create restrictive assumptions (Verbeek 2012). This gives the possibility to analyze changes at the individual level. Panel data not only gives you the opportunity to analyze the difference in behavior among the different observations but also to identify why certain observations behave differently across time. A further benefit of panel data is that it provides a means of determining the magnitude of econometric problems that are commonly presented in empirical studies, namely the often heard assertion that the reason one finds

a certain effect in the presence of omitted variables that are correlated with explanatory variables (Wooldridge, 2002).

The standard pool equation for the econometric model of panel data is as follows:

$$y_{it} = x'_{it}\beta + z'_i\alpha + \varepsilon_{it}$$

There is K x 1 dimensional vector of explanatory variables in x_{it}, not including a constant term. This equations presents heterogeneity across individuals. The individual effect is represented by $z_I\alpha$ where z_i has a constant term and individual specifications are assumed to be constant over time t. The model can be estimated using Ordinary Least Squares when all the z_i are presented across the observations (Greene 2012). Since this is a general model, it is important that some restrictions are placed upon the coefficient. Given the fact that the same individuals are observed over time it is not realistic to assume that the error term will not be uncorrelated from the different time periods (Verbeek 2012).

Therefore, as is the case for this study, OLS is likely to be inefficient relative to an estimator that exploits the correlation in the error term ε_{it} over time. Thus, it can be written as follows:

$$\varepsilon_{it} = \alpha_i + u_{it} ,$$

Here u_{it} is considered as being homokedastic and independent over time (the errors that will change across t and i). On the other hand the term α_i is an unobserved or individual effect time invariant variable.

For a most favorable estimation method it is crucial to know whether or not the unobserved effect is correlated to the observed explanatory variables. In order to cope with this problems to main approaches are taken. The "Random Effects" model, assumes that all the factors affecting the dependent variable and are not included in the regressors, can be summarized by the random error term (Verbeek 2012). It can also be expressed as If the individual effects are strictly uncorrelated with the regressors, then it could be more appropriate to model the individual specific constant

terms as randomly distributed across cross-sectional units (Greene 2013). In this case the term α_i is random.

An alternative approach is the "fixed effects" model arises from the assumption that the omitted effects, $z'_i\alpha$, in the general model specified above are correlated with the explanatory variables. The Fixed effect model is simply a linear regression expressed in the following way:

$$y_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it}$$

In order to calculate the β in the fixed effect model, we need transform the equations to eradicate the unobserved effect. There is more than one way in which this can be done. The first option is by including a dummy variable for each unit i in the model. That is:

$$y_{it} = \sum_{j=1}^{n} \alpha_i \, d_{ij} + x'_{it}\beta + u_{it}$$

Where $d_{ij} = 1$ if $i = j$ and 0 elsewhere. This gives a set of N dummy variables in the model. The parameters for the β and $\alpha_1, \ldots, \alpha_N$. The estimator for β can be done by OLS therefore is known as the "least squares dummy variable estimator" (LSDV). A different way that the results for the estimator β

Is if the regression is carried out in deviations from the individual means (Verbeek 2012). This implies that we eliminate the individual effects

$$y_{it} - \bar{\bar{y}}_1 = (x_{it} + x_i)'\beta + (u_{it} - \bar{u}_i).$$

In this model the transformation produces observations that deviate from the individual means and it is best known as the "within transformation". The OLS estimator for β obtain from this model is called "Fixed effect estimator". This one is consistent and the explanatory variables must be strictly exogenous (Neira et al. 2008). The fixed effects model concentrates on differences within individuals, explain why y_{it} differs from $\bar{y}_i$ but fail to explain why $\bar{y}_i$ is different from $\bar{y}_j$ (Verbeek 2012). An alternative model to eliminate the individual effects is the first difference model.

5.2 Variables

The following table will present the variables used for this study:

Table 1

Variable	Variable name	Description	Units of Measurement	Source
Real GDP/ capita	RGDPch	Real GDP per capita constant national prices obtained from national accounts data for each country	millions of 2005 US $, $RGDP^{NA}$ = $CGDP^{o}$ in 2005	own elaborations based on PWT 8.1
Total factor productivity	CTFP	TFP level, computed with CGDPo , CK, labor input data and LABSH	USA value = 1 in all years	Penn world Tables 8.1
Human Capital	hc	Index of human capital per person, based on years of schooling (Barro/Lee, 2012) and returns to education (Psacharopoulos, 1994)		Penn world Tables 8.1
Trust	Trust	This variable Quantify the effect of social capital. It is based on the percetage of people that responded positevely to the question: "genereally speaking, would you say that most people can be trusted?. It is composed of four different surveys.		World Valuey Surveys
Membership	Membership	this variable is used as a further tool for measuring social capital. It is based on the percentage of people who are active members of some of the associations listed in the WVS		World Valuey Surveys

Therefore the model presented in this paper follows the same logic as the one presented in Neira et al. (2008). The selection of the dependent variable was real GDP per capita which measures the change in GDP growth over time. For the control variables unlike Neira et al. (2008) the selection was made due to new available information in the Penn World Tables. In the case for the economic growth model we will use Total Factor Productivity (TFP), which captures all the different elements used in the classical economic growth models. This new control variable allows us to compare the TFP levels between countries and across time. The second control variable selected was human capital, which has been included in recent economic growth models.

The model presented here is given in the following equation:

$$\log(\text{RGDCH})_{it} = \beta_{0i} + \beta_1 \text{CTPF}_{it} + \beta_2 \text{HC}_{it} + \beta_3 \text{TRUST}_{it} + \beta_4 \text{MEMBERSHIP}_{it} + \varepsilon_{it}$$

During the estimations carried out with common coefficients, it was found that the variable trust was significant when it came to explaining real GDP growth in the sample analyzed. Unlike trust, the membership variable displayed a negative relationship and it was found to be non significant. In order to obtain more robust estimators a General Least Squares model was used.

6. Empirical Results

The following section will present the main results from the estimations. All calculations are shown in *table 2*. Results for each respective regression and model will then be addressed in chronological order. Firstly, the OLS models (*model 1*) will be presented, followed by FGLS (*model 2*). The results from the Fixed effects models will be presented with the "within transformations estimator" and the "LSDV" (*model 3*). The last models presented will be random effects GLS (*model 4*). Interpretations will be applied within a 95% confidence interval. Appendix A includes descriptive statistics for all the variables included, and some of the post estimation tests. The estimations were conducted with the statistical software package Stata, version 13.

Table 2.

Variable	OLS	FGLS	FE	RE
Constant	2.850572	2.850572	2.617871	2.687947
	(0.00)	(0.00)	(0.00)	(0.00)
CTFP	0.451671	0.451671	0.2628	0.300219
	(0.00)	(0.00)	(0.00)	(0.00)
HC	0.339043	0.339043	0.456298	0.437547
	(0.00)	(0.00)	(0.00)	(0.00)
Trust	0.00479	0.00479	0.00117	0.001599
	(0.0053)	(0.0017)	(0.261)	(0.116)
Membership	-0.00142	-0.00142	-0.00019	-0.0004
	(0.0086)	(0.0033)	(0.6043)	(0.2562)
Brazil			0.109982	
			(0.0436)	
Canada			0.154352	
			(0.0088)	
Chile			-0.05143	
			(0.1289)	
Colombia			0.021353	
			(0.6688)	
Mexico			0.074297	
			(0.076)	
Peru			-0.16746	
			(0.0001)	
Trinidad y T.			1.36E-05	
			(0.9998)	
Uruguay			0.066977	
			(0.3519)	
United states			0.028504	
			(0.4118)	
Venezuela			0.223021	
			(0.0003)	
R^2	0.871052		0.979955	

-the dependent variable is a log of Real GDP/capital and the p-values are given in brackets

6.1 Model 1

For the first model (OLS) the estimation was carried out using the common coefficients and the results display that the trust variable was important when explaining economic growth in the sample analyzed. However, this does not seem to be the case with the other proxy for social capital. In the case of membership there is a negative or non significant relation explaining economic growth. It is important to question the reliability of the estimators. Even though the data presented in this study accounts for differences between countries and across time. A Breusch-Pagan / Cook-Weisberg test for heteroskedasticity test was conducted in order to verify the validity of the estimators (APENDIX A). We fail to reject the null hypothesis; therefore, it is assumed that a homogenous sample exists. But due to the composition of the different countries in the study, concerning the variables of interest in the study (TRUST, and MEMBERSHIP) it was decided to utilize different models in order to get more robust results.

6.2 Model 2

The FGLS model was then introduced. The results are very similar to the ones obtained with the simple OLS regression, although the variable for trust was more statistically significant for this model. In this case, as theory would predict, the variables for CTCP and human capital had the most significant impact while explaining the economic growth of the different regions. For the variables of social capital only Trust showed a positive relationship with economic development.

6.2 Model 3 and 4

The results for the fixed effects equation indicated that only the variables for human capital and CTFP were significant in explaining GDP growth/capita. Meanwhile the variables for social capital were not statistically significant. After running a Wald Test to check for heteroskedasticity in the model, the chi values was (0.00) alongside with high values of chi-bar therefore the null hypothesis was rejected and heteroskedasticity was detected. In order to correct for these problems I return to the original OLS and conducted a Breusch-Pagan LM test. The null hypothesis was consequently

rejected, therefore suggesting that a random effect model should be used. The results of the RE model were very similar to those of the FE, with only the variables of human capital and CTFP being relevant in explaining growth.

6.2 Discussion of Results

The importance with respect to this study is that social capital has been shown to be a variable capable of explaining economic growth in developing countries. The complexity of these proxies used to capture social capital means that it is essential to consider the different elements involved in survey-based studies, since sometimes people tend to overestimate the answers. It is also important to consider the formal and informal elements in which the membership or participation in voluntary groups are measured in some of the countries analyzed. Some of the formal limitations might exist with infrastructure or the collection of data. The informal characteristics could be the impact that these groups have in social networks and the spillovers of the participation, especially in reducing the transaction cost of information (Neira et al, 2008).

According to the FGLS Model an increase of 1% in Social Capital (TRUST) implies a 0.005% increase in the real GDP/capita variable. Using this model obtain more robust results. Historically while looking at economic growth, social capital has been out of the equation. Nevertheless, it has been shown that having a peaceful environment, trust in the formal institutions and a healthy climate are essential parts for the economic system to work. Not only by attracting foreign investments, but by providing the opportunity to access credit (Neira et al. 2008). Other ways to enforce a good economic system is by having a positive social climate that helps the development of a country. A positive social climate can be created by expanding the network of the individuals; also a greater consumer confidence translates into a healthier economy.

7. Conclusion

The idea of social capital is becoming of more relevance in the economic debate and although its definition might not yet be a universal one, the importance towards finding the right parameters in order to quantifying it is vital. One of the main targets for researchers is to clearly identify and define the components constituting social capital in order to observe the impact on economic growth.

Like other forms of capital, social capital cannot generate economic growth by itself; it needs to be complimented with other kinds of capital to be relevant for the development of a country. There is the need to invest in social capital since it can also depreciate. Therefore, it is important for policy makers to consider the positive impact that social capital can have, and create different policies that encourage the interaction and integration amongst citizens which in turn will promote trust.

The aim for this study was to estimate the impact of social capital on economic growth in 11 countries in the South and North American region. Trust and membership was used as indicators of social capital in the OLS and FGLS models as well as some fixed and Random effects models in case the model fail to detect any differences between the countries. Although the proxies used to measure social capital might not include all of its definition, it is still considered a relatively accurate estimate.

The results obtain were in line with previous empirical studies. A positive relationship was found in the variable "trust" on the effect that social capital has on economic growth. However, a negative relationship was also found when "membership" was used. Therefore the results underline the importance on the selection of a variable to evaluate the impact that social capital has on the development of a country.

Further research is necessary rewarding social capital, but what it remains clear is that there are other factors needed to be added to economic growth equation and the variables of social capital such as trust could be a start.

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Appendix A. Statistics

Table 3. Descriptive statistics

Variable		Mean	Std. Dev.	Min	Max	Observations	
LogRGD~H	overall	4.088878	.2602844	3.693136	4.634046	N =	44
	between		.2594492	3.778088	4.59935	n =	11
	within		.0716269	3.884918	4.23066	T =	4
CTFP	overall	.7196323	.2464651	.3963194	1.588933	N =	44
	between		.2144356	.4788283	1.132368	n =	11
	within		.1340541	.3275155	1.176197	T =	4
HC	overall	2.70225	.4154662	1.996284	3.618748	N =	44
	between		.4167591	2.156222	3.56232	n =	11
	within		.1050797	2.460388	2.889499	T =	4
Trust	overall	13.84091	12.33061	0	42	N =	44
	between		9.797495	1.75	36.25	n =	11
	within		7.92149	-6.159091	35.84091	T =	4
Member~p	overall	48.59091	33.49649	0	100	N =	44
	between		23.37233	13.75	89	n =	11
	within		24.77621	4.590909	123.5909	T =	4

Table 4. Correlation Matrix

	CTFP	HC	Trust	Member~p
CTFP	1.0000			
HC	0.5673	1.0000		
Trust	0.2349	0.5634	1.0000	
Membership	0.2415	0.2971	0.4764	1.0000

Appendix B. Post estimation tests

```
. hettest CTFP HC Trust Membership

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: CTFP HC Trust Membership

        chi2(4)      =     2.62
        Prob > chi2  =   0.6239
```

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (11)  =    1070.80
Prob>chi2 =     0.0000
```

```
Breusch and Pagan Lagrangian multiplier test for random effects

        LogRGDPCH[country1,t] = Xb + u[country1] + e[country1,t]

        Estimated results:
                            Var       sd = sqrt(Var)

            LogRGDPCH     .067748        .2602844
                    e     .0020136        .044873
                    u     .0046947       .0685178

        Test:   Var(u) = 0
                          chibar2(01) =    20.82
                      Prob > chibar2 =   0.0000
```
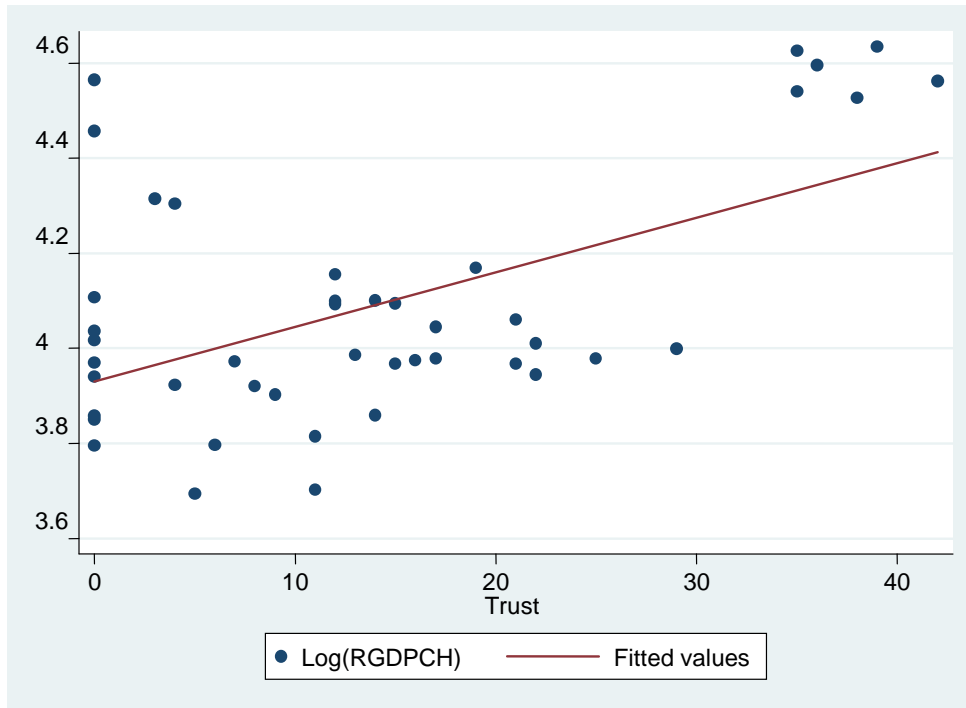
28

Appendix C. Scatter plots

1. Trust

2. Membership