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The Impact of Social Capital and Institutional Quality on Economic Growth

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DEDICATION

I dedicate this work to my parents who have guided and taught me throughout my life. Thank you both for being a constant source of inspiration for me. Also, to my husband whose unconditional love; encouragement and support bring me constant joy. To my sisters for always being there holding my hand during hard time.

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Summary

The concepts of social capital and formal institutional quality are getting more importance in the debate on the determinants of economic growth. In order to determine a deeper context of the interrelation between those concepts, in this thesis the author has tried to analyze how interpersonal trust, considered as a valuable asset, can enable people to build important relationships with one with another and help to secure their individual resources and well-being over time. At the same time we have explained how a strong institutional environment can create a proper incentive structure in an exchange process that will enable to uphold confidence between people within the community through equal access to regulation and legislation.

Taking into consideration this importance to the development of formal regulatory institutions as well as the informal ones, like norms, trust and cooperation between people, to economic growth, the present work has explained to what extent the classical literature illuminates the effect of social capital and institutional quality on economic growth and also identified through which mechanism such qualitative factors can generate a high return in the economy.

Two innovations were drawn out in the present work. *Firstly*, it analyses the different transmission channels through which social capital impacts economic growth and *secondly* examines the different impacts of such qualitative factors on economic growth for various group of countries classified in terms of their levels of income and also their levels of institutional quality.

Four chapters were developed in this thesis to elucidate the relation between social capital, institutional quality and economic growth:

The first chapter identified the key definitions of social capital and scrutinized the relation between the related concept with human capital and economic development, referring to different theories in the economic field.

The second chapter was devoted to analyze, using seemingly unrelated regression method, the different transmission channels through which social capital can influence economic progress in the country in the background of 85 countries and for a subgroup of countries with different levels of income and different levels of institutional environment quality for the period spanning from 1980 to 2009. In this work we consider four transmission channels, which are physical capital investment, financial development, human capital, and institutional quality.

The choice of these transmission channels is based on the fact that: investment, as a transmission channel, is a type of activity that relies more on the future actions of other partners. In fact, high level of trust and cooperation between investors can lead to more honesty within the business environment and reduce the cost of monitoring and enforcing contracts between partners. In the same way, financial transactions in banking and non banking institutions, as another channel, depend not only on the legal enforceability of contract between contractors but also on the people's moral behavior and trust between them. Similarly, education skills gathered in a formal learning system can generate high positive returns for the economy when knowledge and information are shared between people and felt to be more beneficial to the community and economic activity when we see people use them for a positive purposes in strong social environments. The additional transmission channel is related with the quality of institution. It is commonly accepted that, institutions range from formal regulatory environment to an informal and intangible environment consisting of social cooperation, norms, civism and trust between people, which facilitate better transfer and distribution of resource in an economic process.

In the third chapter presented throughout this work the author has employed the dynamic panel system GMM estimators to examine the effect of formal institutional environment quality and social capital on financial development and long-term economic growth. While providing more insights into the concept of social capital and its effect on the development of the financial system, the last and forth chapter was deployed to examine how interpersonal trust can save institutional system from potential economic damage. Using a multi-variable logit model the author has analyzed how well developed institutional environment and high level of social capital can reduce the effect of financial liberalization on the fragility of banking system and the probability of occurrence of banking crisis

Three conclusions can be drawn from this work:

The first is that there is positive and direct association between social capital and economic growth, as well as an indirect positive impact of interpersonal trust on economic activity through its effect on the different transmission channels which are financial development, human capital, institutional quality and investment. This result is also verified for the various categories of group of countries.

The second conclusion stresses the role of formal regulatory institutions and informal institutions, like social capital, norms and interpersonal trust, in the development of financial system and thereby the long-term growth of economic activity. This finding is illustrated for the case of financial liberalization reform and banking crisis.

The third conclusion drawn from this work is that the development of institutional environment as well as social infrastructure with high level of interpersonal trust and cooperation between people within the community play a crucial role in reducing the likelihood of banking crisis occurrence in a country.

Streszczenie

Koncepcje kapitału społecznego i jakości instytucji formalnych zaczynają nabierać coraz większego znaczenia w toczącej się dyskusji nad determinantami wzrostu gospodarczego. W celu określenia pełniejszego kontekstu wzajemnych powiązań między tymi kategoriami w niniejszej pracy przeprowadzona zostanie analiza, której celem jest próba znalezienia odpowiedzi na pytanie: w jaki sposób międzyludzkie zaufanie, uznawane za pozytywne aktywa, może umożliwić ludziom budowanie ważnych relacji między sobą, a także pomóc w zabezpieczeniu posiadanych przez nich zasobów i dobrobytu w dłuższym okresie.

Jednocześnie celem pracy jest wyjaśnienie w jaki sposób silne otoczenie instytucjonalne może przyczynić się do stworzenia właściwej struktury motywacyjnej w procesach wymiany, która pozwoli podtrzymać zaufanie między członkami społeczności wskutek równego dostępu do regulacji i legislacji.

Biorąc pod uwagę duże znaczenie rozwoju regulacji instytucji formalnych, a także instytucji nieformalnych, takich jak: normy, zaufanie i współpraca między ludźmi, dla wzrostu gospodarczego, w niniejszej pracy doktorskiej pokazano: w jakim stopniu w klasycznej literaturze przedmiotu objaśnia się wpływ kapitału społecznego i jakości instytucjonalnej na wzrost gospodarczy oraz zidentyfikowano mechanizmy, dzięki którym wymienione czynniki jakościowe mogą przynosić gospodarce wysokie korzyści.

Rozprawa doktorska zawiera dwie innowacje w stosunku do istniejącej literatury. Pierwsza z nich sprowadza się do wyróżnienia kanałów transmisyjnych poprzez które kapitał społeczny oddziałuje na wzrost gospodarczy. Natomiast druga z nich polega na analizie zróżnicowanego wpływu czynników jakościowych na wzrost gospodarczy w wyodrębnionych

grupach krajów, które różnią się pod względem poziomu dochodów oraz jakości występujących w nich instytucji.

Rozprawa doktorska składa się z czterech rozdziałów, w których wyjaśniane są relacje występujące między kapitałem społecznym, jakością instytucji i wzrostem gospodarczym.

W rozdziale pierwszym podano najważniejsze definicje kapitału społecznego. Określono związki między kapitałem społecznym kapitałem ludzkim i rozwojem gospodarczym w kontekście ważniejszych nurtów współczesnej teorii ekonomii.

W rozdziale drugim przeprowadzono analizę wpływu kapitału społecznego na wzrost gospodarczy w danym kraju, który dokonuje się poprzez różne kanały transmisji. W tym celu zastosowano równoczesne wielorównaniowe modele regresji, które mają autorski charakter. Badania przeprowadzono dla grupy 85 krajów, a następnie wyodrębnionych ich podgrup ze względu na różne poziomy dochodów oraz na zróżnicowany poziom jakości środowisk instytucjonalnych w tych krajach od 1980 do 2009 roku.

Rozpatrzono w nim cztery kanały transmisji wpływu kapitału społecznego na wzrost gospodarczy, za które uznano: inwestycje w kapitał fizyczny, rozwój finansowy, kapitał ludzki i jakość instytucji.

Wybór tych właśnie kanałów przesyłowych opierał się na następującym uzasadnieniu. Inwestycje, w szczególnym przypadku w kapitał fizyczny, są rodzajem działalności, który odnosi się bardziej do przyszłych działań realizowanych przez różnych partnerów. Rzeczywiście, wysoki poziom zaufania i współpracy między inwestorami może prowadzić do większej uczciwości w otoczeniu biznesowym oraz do redukcji kosztów monitorowania i egzekwowania kontraktów wśród partnerów biznesowych. Analogicznie finansowe transakcje w instytucjach bankowych i niebankowych zależą nie tylko od zgodnej z prawem realizacji umów zawartych między kontrahentami, lecz także od ich moralnych postaw i działań, a także wzajemnego zaufania.

Podobnie, poziom wiedzy i umiejętności, nabyte w ramach sformalizowanego systemu edukacji mogą wywierać pozytywny wpływ na gospodarkę o ile wiedza i informacje są dzielone między ludźmi i pożytkowane dla dobra społeczeństwa i gospodarki w silnym środowisku społecznym.

W przypadku czwartego kanału przesyłowego, którym jest jakość instytucji, przyjmuje się powszechnie, że instytucje podlegające regulacjom formalnym, instytucje nieformalne oraz środowisko niematerialne, które tworzą współpraca, normy, postawy obywatelskie i zaufanie między ludźmi służą lepszej wymianie, dystrybucji i alokacji zasobów w procesach gospodarowania.

W rozdziale trzecim zbadano wpływ jakości formalnego środowiska instytucjonalnego i kapitału społecznego na rozwój finansowy i długookresowy wzrost gospodarczy. W tym celu zastosowano uogólnioną metodę momentów GMM. Badania przeprowadzono w odniesieniu do analogicznych grup i podgrup 85 krajów i dla tego samego horyzontu czasu co w rozdziale drugim.

W celu zapewnienia pełniejszego wglądu w koncepcję kapitału społecznego i jego wpływu na rozwój systemu finansowego, w rozdziale czwartym wykorzystano trzeci rodzaj modeli ekonometrycznych, którymi są modele logitowe. Posłużyły one do dyskusji nad tym jak chronić zaufanie między ludźmi w ramach istniejącego systemu instytucjonalnego przed potencjalnymi stratami ekonomicznymi. Przy pomocy tego rodzaju modeli ekonometrycznych zbadano w jaki sposób zaufanie międzyludzkie może przyczynić się do zmniejszenia potencjalnych strat gospodarczych. W szczególności przeanalizowano w jaki sposób dobrze rozwinięte otoczenie instytucjonalne i wysoki poziom kapitału społecznego mogą zmniejszyć wpływ finansowej liberalizacji na kruchość systemu bankowego oraz prawdopodobieństwo wystąpienia kryzysu bankowego.

Z pracy wynikają trzy najważniejsze wnioski.

Po pierwsze, istnieje pozytywny i bezpośredni związek między kapitałem społecznym i wzrostem gospodarczym, podobnie jak istnieje pozytywny i pośredni wpływ interpersonalnego zaufania na działalność gospodarczą za pośrednictwem różnych kanałów przesyłowych, którymi są rozwój finansowy, kapitał ludzki, jakość instytucji i inwestycje. Wniosek ten jest wynikiem badań empirycznych prowadzonych dla różnych kategorii grup krajów.

Po drugie, instytucje podlegające formalnym regulacjom oraz instytucje nieformalne, do których zalicza się kapitał społeczny, normy i interpersonalne zainteresowanie, grają ważną rolę w rozwoju systemu finansowego oraz długookresowym wzroście gospodarczym. Wniosek ten jest ilustrowany przykładami reform liberalizujących systemy finansowe oraz bankowych kryzysów.

Po trzecie, rozwój środowiska instytucjonalnego oraz infrastruktury społecznej, charakteryzującej się wysokim poziomem zaufania i współpracy między członkami określonej wspólnoty, grają kluczową rolę w zmniejszeniu prawdopodobieństwa wystąpienia kryzysu bankowego w danym kraju.

Słowa kluczowe: Kapitał społeczny, kapitał ludzki, jakość instytucji, wzrost gospodarczy, rozwój gospodarczy.

INTRODUCTION

Theoretical foundations of the thesis

Over the past years, a number of theoretical and empirical studies have attempted to identify important factors driving economic growth in major developed and developing economies. In fact, these concepts trace their origin to the first industrial revolution and became popular after the publication of the "The Wealth of Nations" in 1776. Adam Smith highlighted the relation between capital formation and savings as important determinants of economic growth. Later, Thomas Malthus in the "Essay on the Principle of Population" [1798] gave another dimension to the concept. According to him, the growth rate of the population can be a factor to stimulate the economic growth as long as it is accompanied by an effective labor demand. In 1817, David Ricardo in his publication "On the Principles of Political Economy and Taxation" pointed out a new concept and explained that endogenous mechanism like accumulation of physical capital is likely to affect the economic equilibrium in the long run. In his thesis, Ricardo showed that the rate of profit tends to be equal between sectors and converges to zero in the long run. Another distinguishing study developed by Schumpeter [1912] highlighted the importance of entrepreneurship to encourage economic growth. In fact, industrial progress and innovation constitute the fundamental impulse to stimulate capitalist incentive because it creates new production method and new types of industrial organization.

Following the 1929 crisis, many economists, inspired by the work of J.M. Keynes [1936], tried to examine the scope of balanced economic growth as well. One of them, Domar [1946], suggested that investment had a double influence in the economy throughout its effect on income and employment. Neoclassical theory, as it is conceived today, was developed successively by Ramsey [1928], Solow [1956], Swan [1956], Cass [1965] and Koopmans [1965]. In his contemporary economic growth model Ramsey [1928], the pioneer of economic

growth theory, argues that it is difficult to study the consumption theory without referring to the condition of optimality. Also, Solow [1956] and Swan [1956] tried to clarify the role of the accumulation of the physical capital, the rate of saving and exogenous technical progress in the economic growth. Cass [1965] and Koopmans [1965], using optimization analysis, suggested that long-term economic growth is linked to the exogenous technological progress growth rate. In fact, the argument introduced by Cass and Koopmans is that all economies which have access to the same technologies must converge towards the same income per capita.

It is worth saying that debate on the determinants of economic growth has been controversial for a long time. Some economists have argued that economic growth is determined by exogenous factors while others have argued that it is more linked to some endogenous determinants. Researches on the economic growth model during the middle of the 1980s made a new great stride. Romer [1986], Lucas [1988], Barro [1991] and Grossman and Helpman [1991] tried to explain that economic growth rate was highly linked to some endogenous factors. According to them, the technological progress, which was considered previously by Cass [1965] and Koopmans [1965] as exogenous, is more or less determined by the human capital, the productive public expenditure, the research and development, trade openness and institutional environment. These factors together act positively on economic activities, measured by the gross domestic product (GDP), and wealth created in a country. However, despite all these efforts to select the determinant of economic growth and its measure, it appears that economic growth in a country may not reflect the well-being of people because it does not take into account other qualitative aspects like social costs, and it also does not record the underground economy. All these may decrease the value of economic growth and later the well-being of people within the community. In fact, various literatures pointed out the importance of economic development concept as a complement to the traditional economic literature that explains growth through efficient allocation of resources and evaluate economic

growth by the annual increase of GDP. Authors like Todaro and Smith [2009] argue that the economic development concept deals with greater scope of issues such as social, institutional mechanisms and large-scale factors that improves the level of living of the people.

The economic development concept, however, is a qualitative phenomenon, irreversible and can only be observed over a very long period. We can define a development process by the combination of changes in the overall economic, social, cultural and demographic structures[1]. Many criteria evolve simultaneously in the production process and in the labor force, like life expectancy, the infant mortality rate, literacy rate, the number of students, researchers, etc. These indicators are therefore, the qualitative aspects that are not addressed by the measure of economic growth. Clearly there is a link between these two concepts as growth provides resources to finance development, while at the same time development is accompanied by improvement of living favorable to growth.

Indeed, the task of identifying how to achieve economic development remains one of the major concerns of economic theory. Some studies highlighted the issue of income difference among countries, and why some have achieved double digit economic growth (particularly East Asian countries), while others remain at a lower range (particularly Sub-Saharan African countries). To clarify this, Chenery [1975] pointed out some of the deficiencies of the neoclassical approach for developing countries. According to him, the existent literature does not take into account factors like market imperfection, external constraints, domestic demand constraints and a number of other factors raised by development economists.

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[1] Any changes in the standard of living will generate a positive impact on the quality of life of people in the community.

Motivation

Actually, rethinking the issue of economic development leads economists to incorporate other qualitative factors in economic growth models. Many regard the concept of social capital as a key ingredient of economic development.

The purpose of the present work is to explain to what extent does the economic literature, mentioned earlier, illuminates the effect of social capital on economic growth and to find out how the social capital literature can be moved forward, particularly in terms of its transmission channel. The main idea behind this work is to show that economic growth can make more and more resources available for the well-being of the individual, in particular, and the community in general; at the same time good social conditions improve the quality of institutional environment, which may impact on the economic activity and long run economic growth.

Actually, the conception of individual well-being depends on many factors like social environment, individual social status and aptitude to build important and satisfactory relationships with other persons. In other words, individual well-being becomes not only a matter of achieving better work and life balance but also a matter of building-up a satisfactory individual and social identity that can help to secure over time individual businesses as well as community cohesion. However, these two processes in some cases may not be feasible because indecent people may engage in corrupt activities and end up getting things done illegally and thereby generate considerable economic damage to society.

What are the transmission channels through which social factors like individual networks, trust, and civic society can impact on economic performance? And, what measures can be taken to satisfy and secure individual well-being in the society is the question?

To answer to these questions we will try in this work to explain, *first*, what we mean by social capital. And, *second*, explain through which mechanism such as social capital can generate a high return in the economy.

Understanding the importance of building relation with people with good faith within a group or a community will allow us to highlight the mechanisms through which social capital can impact positively economic growth in the long term. Moreover, a better social environment, with good information sharing, knowledge, and respects of rule and law, is a perfect ground for the dissemination of good norms and trust. In this respect, improving social confidence between people within the society is a matter of knowing how to maintain a good institutional environment that respects legal rule of law and operate for the welfare of all people, and also how to build good cultural and social education between people to sustain economic well-being over time.

In light of the literature on social capital, there are two innovations in our work. *First*, to our knowledge, there are no studies which have unearthed the transmission channels by which social capital impacts economic growth[2]. The *second* novelty of this work is the deliberate focus to analyze the impact of such a qualitative factors on economic growth for different groups of countries with the different levels of income and also with the different levels of institutional quality[3].

Organization of the thesis

To analyze the importance of social capital and the mechanisms through which it can impact positively economic growth, we will try to develop the key issues into four chapters.

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[2] As a continuation of my earlier paper published in 2008, the present work analyzed the transmission channels by which interpersonal trust as proxy of social capital impacts economic growth for a larger sample of countries than previously used.

[3] In future research paper we are planning to test the same idea of the impact of social capital and its transmission channels on economic growth for other different types of classification of group of countries for example with different political system, religions, cultures ect….

In the first chapter, we will highlight two main ideas: *first*, whether there is a relationship between social capital and other determinants of economic growth like human capital. *Second*, we focus on the importance of social capital through the process of economic and institutional development. To do this, the first chapter will include five main sections. In the first section, we will set out the main definitions of social capital as explored in the literature. The second section will present the relationship between social capital and human capital. The third will analyze how social network can influence the process of economic development. The fourth section will present the relationship between social capital and institutional development. Finally, section five will pull together the main conclusion of the chapter.

In the second chapter, we will discuss the hypothesis that social capital has a direct and indirect impact on economic growth with particular emphasis on the different transmission channels of social capital to economic activity. Since individual relationships do not enter in the gross domestic product (GDP), in this section we will analyze how social capital accumulation can contribute to economic growth: *first*, for a sample of 85 countries, and *second* for different groups of countries with different levels of income and different levels of institutional quality over the period spanning from 1980–2009.

Four main transmission channels are highlighted in the second chapter; these are human capital, financial development, physical capital investment, and institutional quality. The choice of these channels is not random. In fact, the knowledge and skills gathered in the formal learning system can be sustained to positively impact economic growth when there are strong social environment platform and active social network and trust between individual, where people share freely information and knowledge between them. Indeed, the quality of interaction between people matters in the sense that individuals may misuse the knowledge

they have and accomplish less in the environment with less trust and cooperation between people.

Similarly, transactions in the financial system are nothing more than daily basic exchange of money on a promise to return it in the future. Such an exchange will therefore depend not only on the legal enforceability of contract between the financer and the financee but also on the people's moral attitude and trust between each of the contactors. It is then evident that the use of financial contracts within the community will depend upon the level of trust between the groups.

Physical capital investment is also considered as another transmission channel of social capital to economic growth. In fact, higher trust and cooperative behavior between economic agents lead to more honesty within the business environment and reduce the cost of monitoring and enforcing contracts between partners. In the presence of high trust and civic norms between partners, the available resources in terms of money and time will be used for real productive activities. Investment is a type of activity that relies more on the future actions of other partners, which can be done at lower costs if there is high confidence environment.

The fourth transmission channel of social capital quoted in the literature is institutional quality. It is clear that an institution's system of governance defines the structure of human incentive in an exchange process. In fact, weak institutions will increase the level of uncertainty and untruthfulness in the organization, and reduce the efficiency of investment that will impact negatively on economic growth. However, institutions range from formal regulative environment to an informal and intangible environment that consists of social cooperation, norms, civic and trust between people, which facilitate better transfer and distribution of resources in an economic process. In fact, institution provides the structure of interaction and builds up the relationship, at the same time it enables to uphold confidence between people within the community through equal access to regulatory and legislation.

Given that social capital interacts with each of the transmission channels and economic growth, in the second chapter we will try to examine this connection between economic growth and investment, financial development, human capital, institutional quality as well as social capital, using the simultaneous equations model as an effective tool to analyze the interconnected multivariable system of equation. In our model, we will utilize the trust index as a measure of social capital and as an important component of any social cohesion as well as indicator of people honesty and cooperation based on commonly shared norms. The set of transmission channels includes the investment indicators, measured by the ratio of gross capital formation with respect to GDP; the human capital indicator, measured by the average school enrollment secondary (% gross)[4]; the financial development indicator, measured by the average ratio of liquid liabilities (or money supply) to GDP; and finally, the institutional quality environment, measured by institutional quality index introduced and calculated by Kaufmann et al. [2010]

The main finding in this chapter is that there is a positive and significant association between social capital and economic growth. This effect of social capital on economic growth can be viewed through different transmission channels which are financial system, human capital and institution. This result is also confirmed for the set of developed and developing countries taken separately, as well as for the group of countries with high control of corruption and medium and low control of corruption. Such outcome can help us to understand more the mechanism through which social capital operates.

In the third chapter we will discuss the hypothesis that formal institutional environment quality, as one of the transmission channels, and social capital can influence financial system development and long-term economic growth. In fact, institution is made up of both formal and informal rules. The formal rules have mainly the character of being

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[4] The choice of this measure is due to the availability of data.

straightforward and defined by laws and regulations. However, informal rules are more intangible and categorize all norms and people's behaviour within the society that can deliver informal constraints and do not show up in formal institutional system and can impact on economic activity's fluidity and transparency.

The output of the estimated dynamic panel system GMM model[5] shows the importance of social capital values in financial development and long-term economic growth. At the same time improvement in the quality of formal institution such legal rule of law plays an important role in the progress of financial institution that will impact positively on economic performance and growth.

While providing more insights to the concept of social capital and its effect on the development of institutional quality, chapter four will be dedicated to study how loyal and interpersonal trustful society can save institutional systems from potential economic damage. In this chapter, we will analyze this relationship for a particular phenomenon, namely banking crisis. *First*, we will test the hypothesis that banking crisis may come along with financial liberalization and *second* see especially if the probability of banking crises depends on factors other than those related to market conditions: i.e. the quality of the environment institution or the degree of trust between different actors within the economy.

The different estimates carried out in this chapter emphasis on the importance of the development of institutional as well as social environment, trust and cooperation between people in reducing the probability of occurrence of banking crisis. Effective trustful network and civic activities can also help to improve financial activities in the banking system that can generate later positive impact on economic growth.

Light at the end of the thesis, all drawn conclusions in each chapter on the importance of social capital and institutional quality to economic growth will be specifically developed

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[5] The dynamic panel system GMM model offer a convenient framework for obtaining efficient estimator and solve the problem of endogeneity that may arise between the estimators.

with an eye view toward strong, stable, sustainable and healthy community. Numbers of future research direction will be also suggested to give more insight to the concept of social capital and its importance to community well being.

Chapter I

Social capital, human capital, economic growth and development

1.1. Introduction

During the 1990's a number of researchers have focused on analyzing the concept of social capital and its importance to economic development. The first contributions to this debate go back at least to that of Hanifan [1916] who tried to show the importance of community participation in improving the quality of education. Later, Banfield [1958] demonstrated that the economic backwardness of southern Italy was due to the low level of social capital within the nation. Since then, many sociologists like Homans [1961], Jacobs [1961] and Loury [1977] used the notion of social capital to explain the importance of community links to the development throughout the nation. Similarly, researchers in the economic fields such as Durlauf [2002], Helliwell [1996], Knack and Keefer [1997] and health [Lynch et al., 1997] also contributed to the debate. However, despite all efforts to enlighten the notion of social capital, many economists still did not show significant interest in it; until the contributions of Bourdieu [1980, 1986], Coleman [1988] and Putnam et al. [1993] that polarized the concept of social capital and its use became fully compatible with the relational understanding of economic actors' activities.

It is largely accepted that the historical literature on economic growth focuses mainly on physical capital, human capital and technological progress as key determinants of economic growth; however, it neglects other qualitative factors that may impact positively on economic growth and lead to economic development of a country. In the first half of the

chapter we will try to point out the most relevant definitions of this qualitative factor and shed the light on relatively few aspects of the complex interplay between social capital, human capital, economic growth and economic development. The main theme is to show that there is a link between these concepts. On the one side, economic development generates more resources available and better condition for the well-being of the nation; and on the other side, good social environment enriches institutional quality, which has an impact on the economic activity and the long-run economic growth. In the second half of the chapter, we will analyze the related concept of social capital with reference to different theories in the economic field like developmental and institutional theories.

1.2.   Definitions of social capital

The past decades have seen many investigations of the concept of social capital and its eventual connection to economic performance. However, definition of the notion remained elusive due to the lack of appropriate data and uniform measurement method widely accepted by the literature. The first recorded instance of the term social capital can be traced back at least to Hanifan [1916] who underlined the importance of community participation in promoting quality of schooling. Later, Banfield [1958] used the social capital concept to account for the economic backwardness of the south of Italy, but did not express significant interest in the development economics debate. The term "social capital" also continued to be present in social science debates and in the contribution of Homans [1961], Jacobs [1961], and Loury [1977] that used the term to underline the benefit of community ties. Nevertheless, the lack of conceptual clarity led to overuse of the notion of social capital in such a way "*trying to explain too much with too little and be adopted indiscriminately and applied imprecisely*" [Lynch et al. 2000].

The popularization of the concept in recent decades can be owed to Bourdieu [1980, 1986], in whose works social capital is conceived as a resource that arises from membership in associations, communities, and social networks. According to him, *"The volume of social capital possessed by a given agent depends on the size of the network of connections that he can effectively mobilize"*.

Coleman [1988, 1990] added a new dimension to the concept and considered that social capital can be defined by its functions, where it is recognized as a group of entities acting to facilitate individual actions in different organized structures. As argued by Coleman, social capital can have three forms; *firstly*, obligations and expectations which depend on the trustworthiness of the social environment; *secondly*, the capacity of information to flow through the social structure in order to provide a basis for action and *thirdly*, the presence of norms accompanied by effective sanctions.

In the early 1990s, this sociological concept experienced resurrection since it was adopted by political scientists like Putnam et al. [1993] and Fukuyama [1995]. Putnam et al. [1993] classifies social capital as *"features of social life such as networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives"*. In this context and according to this view, social capital became a virtue of nations where individuals obey laws, choose their leaders in a democratic way and show high levels of cooperation between themselves. It is also considered as positive group externality that arises from social organization, an argument largely debated by Fukuyama [1995] who suggests that only certain shared norms and values may be regarded as social capital. According to him *"Social capital can be defined simply as the existence of a certain set of informal rules or norms shared among members of a group that permits cooperation among them. The norms that produce social capital must substantively include meeting of obligations, and reciprocity"*. Similarly, the OECD [2001] pictures the notion of social capital as *"networks together with*

shared norms, values and understandings that facilitate co-operation within or among groups". In addition, the World Bank [2011] suggests that "*Social capital refers to the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions. Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together*".

In sum, there are two main approaches to explain the concept of social capital: *one* considers social capital as an individual attribute[6] and *another* argues that social capital or the social network can be more an attribute of the community itself[7].

In the field of economics, it has become more and more accepted that social capital improves not only the capabilities of the different agents at an individual level, but also the general economic performance at the aggregate one. Becker's [1974, 1996] social capital is conceived as an intermediate good to produce the basic needs of individuals. Moreover, a clean social environment where people meet freely and frequently is an ideal ground for the adoption and diffusion of good norms and trust. Therefore, a generalized trust for the society can reduce uncertainty and the average transaction costs just like other inputs [Torsvik 2000; Zak and Knack 2001].

At an aggregate level, generalized trust-based relations may have a positive impact of the process of development and economic growth in particular. It may be a factor that accounts for the gap of growth performances between regions even in developed countries and the underdevelopment of urban and rural areas in the poor countries [Temple and Johnson 1998, 2001; Guizo et al. 2000]. Ostrom [2000] and Rose [2000] argue that high level of social capital generate an added value to economic growth by facilitating alliance between people interests that will have a positive impact in the production process. Mogues and Carter [2005], Rupasingha et al. [2006] add that countries with relatively high stock of social capital, in

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[6] Individualistic view was documented mainly by Coleman [1988, 1990] and Bourdieu [1980, 1986].
[7] Communitarian view was supported mainly by Putnam et al. [1993].

terms of generalized trust and widespread civic engagement seem to achieve higher levels of economic growth, compared to those with the low levels of trust and civic.

Actually, both views of social capital with an individual-level definition and community level one are present in the literature. In the following section we will discuss the core intuition guiding the social capital research.

1.2.1. Individualistic view of social capital:

An expanding economic literature perceives social capital as an individual resource held by a person [Paldam and Svendsen, 2004] as well as an instrument to edge down transaction costs in the investment process [Szreter, 2000]. This individualistic vision appears also in the study by Glaeser, Sacerdote and Laibson [2000]. According to them, individual social capital is "*a person's social characteristics including social skills, charisma and the size of his Rolodex which enables him to reap market and non-market returns from interactions with others*". Using an optimal individual investment decision[8] model Glaeser et *al.* considers that every individual acquires per-period utility flow of $S \times R(\hat{S})$ where, S represents the individual social capital as a stock variable. $\hat{S}$ refers to the aggregate per capita social capital stock and $R(\hat{S})$ is the differentiable function of aggregate per-capita social capital.

In fact, $S \times R(\hat{S})$ can reflect both market and non-market returns. The market returns may take into account the level of individuals' salary and position within the society. The non-market returns can be composed of community well-being progress, as well as improvements in living standards and happiness in the society. It is assumed that social capital generates positive externalities : $R'(\hat{S}) > 0$.

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[8] The difference between individual decision analysis and the group decision analysis is that this former emphasis only on the decisions of individual actors in contrast with the decision to the group stresses more on institution and aggregate group outcome.

The equation of the depreciation factor φ arising from mobility, which can decrease social capital if there is no investment to renew, can be represented as follows:

$$\varphi = \theta + (1 - \theta)\lambda, \tag{1.1}$$

where: θ is the probability to reside with the same community and λ is the discount factor if the individual changes the location where he lives.

The individual maximizes his objective function, taking into account the aggregate social capital per capita, $\hat{S}$ as fixed.

The individual's maximization problem can be stated as follows:

$$\max_{I_0, I_1 \ldots \ldots I_T} \sum_{t=0}^{T} \beta^t \left[S_t \times R(\hat{S_t}) - wC(I_t) \right], \tag{1.2}$$

subject to:

$$S_{t+1} = \delta\varphi S_t + I_t \quad , \forall t \in \{0, 1, \ldots \ldots, T - 1\},$$

where: I_t- the investment made at the moment t; $C(I_t)$- the time cost of investment (where the function $C(.)$ is increasing and convex); w- the opportunity cost of leisure time, S_t refers to the stock of social capital that has been accumulated over time until the moment t, φ- the depreciation factor occurring from mobility and $1 - \theta$- means the depreciation rate which reflects "*the effects of changes in the mortality rates of the other members of one's social network and changes in one's own physical and mental ability*". According to Glaeser et al. [2000] an increase in the depreciation rate would adjust the predicted decrease in social capital investment in the future. T - individuals' lifespan and β - the discount rate.

The individuals can move from one place to another but such change has the impact to decrease their amount of social capital.

The first-order condition is as follows:

$$wC'(I_t) = \frac{1 - (\beta\delta\varphi)^{T-t+1}}{1 - \beta\delta\varphi} R(\hat{S}). \tag{1.3}$$

The static results show that social capital investment increases with the discount rate β and with the returns to social skills gained from a high amount of the social capital in the community $R(\hat{S})$. Furthermore, it rises in community with more aggregate social capital $\hat{S}$ and when social capital is fewer community specific, measured by the parameter φ.

However, social capital investment declines with the mobilityφ, with the opportunity cost of time w, with the rate of depreciation $(1-\delta)$ and age t.

The level of social capital accumulation depreciates toward the end of life, and the benefit of investment goes to zero. Therefore, Glaeser et al. [2000] in their model suggest that individual social capital will peak during the person's midlife[9].

Given this, we can distinguish two main properties of social capital. One regards social capital as an asset with higher community specification and the other one considers it as capital with strong interpersonal complementarities[10]. These complementarities may put forward large social multipliers and its effect on the change in a parameter may be higher compared with the effect on the change in the same parameter for an individual.

Putting these points into formula, Glaeser et al. [2000] assumed infinite time-horizon $T = +\infty$ and examine the steady-state levels of social capital. According to them, in the steady state $I = (1-\delta)S$ and considering changes in individual wages we obtain[11]:

$$\frac{\partial S}{\partial w} = -\frac{C'\big((1-\delta)S\big)}{(1-\delta)wC''\big((1-\delta)S\big)} \ . \qquad (1.4)$$

In case of an aggregate change in wages, with the assumption that the community is homogenous where $S = \hat{S}$, we have:

$$\frac{\partial \hat{S}}{\partial w} = -\frac{C'\big((1-\delta)S\big)}{(1-\delta)wC''\big((1-\delta)S\big)-R'(\hat{S})/(1-\beta\delta\varphi)} = \frac{1}{1-\frac{\partial \hat{S}}{\partial S}}\frac{\partial S}{\partial w}, \qquad (1.5)$$

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[9] This result supposes that the function $R(\hat{S})$ does not vary over the life cycle.
[10] This finding can be also true for both physical and human capital.
[11] Holding community levels of social capital is constant.

where: $\dfrac{1}{1-\frac{\partial \widehat{S}}{\partial S}}$ is the social capital multiplier. Equations (1.4) and (1.5) show that an aggregate change in wages has a bigger impact on social capital compared with an individual change in wages.

Therefore, being a part of any social network, such as an association, can help an individual to build his social capital that will generate later tangible and intangible returns such as information flows, trust, loyalty, altruism, and cooperation, which will serve both the investor and the other members to the network.

1.2.2. Communitarian view of social capital

In the literature the concept of social capital has been used to show how such resources can jointly with other factors such as, financial, physical and human capital, produce a different levels of outcome. Beugelsdijk and Smulder [2009], in their study regarding the importance of social capital on economic growth have tried to show the effect of the two types of social interaction on economic growth. These authors could demonstrate that the degree of social interaction between expanding numbers of individuals have a positive effect on economic growth while close interactions can only hinder economic growth. To analyze these results Beugelsdijk and Smulder [2009] consider the following utility function form:

$$U = U(C,S); \quad U_C, U_S > 0, \tag{1.6}$$

where: C refers to the consumption of goods and S represents social interaction. U_C, U_S are the marginal utilities of C and S, respectively. In their paper, social interaction is defined as the level of individual participation in social networks, and it can have two forms:

- closed network that is limited to family and friends noted $f - network$; "Bonding".

- open network that brings together different community noted $v - network$; "Bridging".

The utility function of individual social interaction can be as follows:

$$S = S(f, v),$$ (1.7)

where: $S_f, S_v > 0,$

f represents the intensity of participation in $f - network$ and v refers to the intensity of participation in $v - network$ measured by the time devoted to it. S_f, S_v are the marginal utilities of f and v, respectively.

The specification of the standard constant elasticity of substitution (CES) function is as follows:

$$U(C, S) = \left(\mu^{\frac{1}{\sigma_{CS}}} C^{\frac{(\sigma_{CS}-1)}{\sigma_{CS}}} + S^{\frac{\sigma_{CS}-1}{\sigma_{CS}}} \right)^{\frac{\sigma_{CS}}{(\sigma_{CS}-1)}},$$ (1.8)

and:

$$S(f, v) = \left(\varphi^{\frac{1}{\sigma_{vf}}} f^{\frac{(\sigma_{vf}-1)}{\sigma_{vf}}} + v^{\frac{(\sigma_{vf}-1)}{\sigma_{vf}}} \right)^{\frac{\sigma_{vf}}{(\sigma_{vf}-1)}},$$ (1.9)

where: μ refers to the materialism preference parameter[12], φ represents to the family ties preference parameter, which measures the importance of $f - network$ relative to $v - network$ $\left(\frac{f-network}{v-network} \right)$ and σ_{vf} and σ_{CS} characterize the elasticity of substitution between the two types of social networks and between consumption and social interaction, respectively.

Individuals' choice between present consumption and social interaction is constrained by the time (or budget). Consumption is constrained by income, which is derived from working at a wage W and from rent seeking transfers, X according to the following budget constraint:

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[12] It measures individual preference to material consumption relative to social interaction.

$$C = (n_0 - f - v)W + X, \tag{1.10}$$

where: $n_0 -$ the total time available for working and social interaction, $f -$ the time devoted to social interaction in $f - networks$, $v -$ the time devoted to social interaction in $v - networks$. W represents the individual's wage and, X refers to the transfer (which may be negative).

Individual social capital requires social interaction and time, which comes at the cost of working time. Hence the trade-off between social interaction and material consumption may have negative effect on economy in the process of creation of social capital. Despite the negative side of social capital to the economy, Beugelsdijk and Smulder [2009] assume that social interaction may have positive impact on economic activity through its effect on the degree of people opportunism. The idea is that agents engage in (time-consuming) rent seeking activities, by which we mean corruption and extorting, shirking and distrusting. By doing so, they can effectively extract part of the income of others. However, participation in open networks v protects agents against rent-seeking: we assume that people that are in the same open network never rob each other.

To gain value added benefit from social network and interactions people tried to built-up reputation and honesty across members of the group in order to protect themselves from any act of robbery or rent-seeking. Beugelsdijk and Smulder [2009] identify two sets of income extraction: the direct one can be linked to theft or robbery and the indirect one can be associated with cheating. In the model the authors assume rent-seeking is directed at persons outside his own community $f - network$. But, you may risk that some of your rent-seeking actions affect members from your group $v - network$, something you can avoid only after you have already spent the time preparing the rent-seeking activities z. In such a situation the

expected average benefit of rent-seeking can be $B(z)W$, where W refers to the average wage and z refers to the time devoted to preparing rent-seeking activities[13].

In total, the actual benefit will be $(1 - v)B(z)W$ because only persons outside the $v - network$ will be eventually robbed. In this case, Beugelsdijk and Smulder [2009] assume that the higher the wage and the rent seeking; the smaller is the number of fellows in the $v - network$, who will desist from robbing.

At the same time these gross negative fund transfers can be articulated as $(1 - v)D(z)W$, where $D(z)$ refers to the damage from being robbed per unit of wage income, and z is the average level of rent-seeking activity within the society.

Therefore, the net transfer from this robbing act can be as follows:

$$X = (1 - v)[B(z)\overline{W} - D(\bar{z})W] \,, \tag{1.11}$$

where: z refers to the time devoted to rent-seeking, and the opportunity cost of time devoted to work and social interaction. Normalizing the total time endowment to unity, the following time constraint applies: $n_0 = 1 - z$, where $n_0 -$ is the time spent for work and social interaction.

The consumer-choice optimization problem can be summarized as follows:

$$\max U = U(C, S), \tag{1.12}$$

subject to:

$$S = S(f, v), \tag{1.13}$$

$$C = (1 - v - f - z)W + (1 - v)[B(z)\overline{W} - D(\bar{z})W], \tag{1.14}$$

where: $\bar{z}$, W and $\overline{W}$ are respectively: the rent-seeking levels in society, the individual wage and the average wage. The first-order maximization conditions can be represented as follows:

$$W = (1 - v)B'_z(z)\overline{W} \,. \tag{1.15}$$

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[13] Rent seeking implies randomly selecting a number of persons and extracting income from them.

In this equation (1.15) the marginal benefits of rent-seeking (left-hand side) is equal to the marginal opportunity cost[14] (right-hand side).

$$\frac{S_f(f,v)}{S_v(f,v)} = 1 - \left[D(\bar{z}) - B(z)\frac{\overline{W}}{W} \right]. \tag{1.16}$$

Equation (1.16) evaluates the optimal trade-off between the two types of network interactions. The left-hand side of the equation represents the amount of time devoted to $v - network$ that individual is willing to give up in exchange for an additional unit of time devoted to $v - network$ participation (marginal rate of substitution). The right-hand side gives the opportunity cost of engaging in $f - network$ participation rather than in $f - network$ participation (marginal rate of transformation).

Spending time with friends has a relatively low cost compared to spend time in extra community networks, if the net loss from rent-seeking is high.

$$\frac{U_C(C,S)}{U_S(C,S)} = \frac{S_f(f,v)}{W}. \tag{1.17}$$

The equation (1.17) determines the optimal trade-off between the material consumption and social interaction in $f - network$.

Static equilibrium under symmetry

In their model Beugelsdijk and Smulder [2009] suppose that all agents have the same revenue and preference and will make the same decision choices.

Hence we have:

$$z = \bar{z} \text{ and } W = \overline{W}. \tag{1.18}$$

They assume that if all agents engage in the same intensity of rent-seeking, the losses are a constant factor $1 + \zeta$ larger than the benefits:

$$D(z) = (1 + \zeta)B(z), \tag{1.19}$$

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[14] The wage on foregone labor time.

Therefore, rent-seeking act will be a negative sum game: what the extorter gains is less than the damage to the person being extorted. At the same time, the portion of the money may be lost "in the battle" or seized by authorities. One could also consider this as an implicit way of modeling the costs that the victim has to bear to circumvent cheating and shirking called as well monitoring costs. Parameter ζ captures this externality cost of rent-seeking[15].

To summarize, we distinguish exogenous and endogenous driving forces in the model: the first group includes labor wage W, preference for material consumption (materialism μ) and preference for family and friends' ties φ. And, the second set refers to variables like C and v. In the equation (1.15) and (1.18) shows that there is a negative relationship between z and v:

$$z = z(v), \quad z_v < 0 . \tag{1.20}$$

Then, substituting this result and (1.20) and (1.19) into (1.16) will show that f is a positive function of v and φ:

$$f = F(v, \varphi), \quad F_v, F_\varphi > 0, \tag{1.21}$$

where F_v, F_φ are the marginal utilities of v and φ, respectively.

Substituting these results into the budget constraint, the following budget constraint can be written as:

$$C = W\big[1 - v - F(v, \varphi) - z(v) - (1 - v)\xi B\big(z(v)\big)\big] = T(v, \varphi, w), \tag{1.22}$$

where $T_\varphi < 0$ and $T_W > 0$.

The above equation shows that networks can impact economic activity through five channels[16]. The first illustrates that more social interaction in $v - networks$ reduces directly labor time and hence reduce output. Second, different types of social networking are positively correlated, so an increase in $v - networking$ also increases time spent with friends and family and further reduces working time. Beugelsdijk and Smulder [2009] call these effects the *labour time crowding out effect*. The three other effects come from the fact that

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[15] It is realistic to add this negative externality. However, all our qualitative results go through when $\zeta = 0$.

[16] It corresponds to the five places where v shows up in equation (1.22).

$v - network$ protects against rent-seeking. In extended social networks, there are less acts of rent-seeking and robbery; more time will be devoted to production process, and smaller is the total negative externality. Therefore, the negative and positive effects of $v - networks$ on economic activity will depend on whether the negative labor time crowding out effect dominates or not the positive protection against a rent-seeking effect.

In the equation (1.22) Beugelsdijk and Smulder [2009] show that materialism μ has no direct impact on the economy; however, it can have an indirect impact of economic activity only through its effect on v. Indeed, after substituting the solutions for f and z into equation (1.17), equation in C and v, including μ can be written as follows:

$$C = C(v, \varphi, \mu, W) \qquad \text{where} \quad C_v, C_\mu, C_W > 0. \qquad (1.23)$$

The above equation shows that there is a positive relationship between consumption and $v - networks$. This result is not a surprise as social interaction and material consumption goods are considered as normal goods and spending on these two can be higher of the category of rich people. Also, more materialistic preferences (higher μ) or higher-income W results in higher consumption for given v.

According to Beugelsdijk and Smulder [2009], the sign of φ is ambiguous because on one hand, high penchant to family ties can have the impact to keep away individual preferences to material consumption, and on another hand a given level of interaction with family and friends can lead to more utility from social interaction.

Another result found by Beugelsdijk and Smulder [2009] is that stronger preference for closer network and family attaches (higher f) can have two reverse effects: it has a substitution effect because it swings people's attention away from material consumption, and income effect because interaction with family and friends generates more utility from social interaction and increase material consumption C.

The graphical representation of equations (1.22) and (1.23) can be seen in a simple diagram as follows:

Figure 1.1. Semi-reduced form of equations 1.22 and 1.23
(The dotted line reflects the increase in materialism)
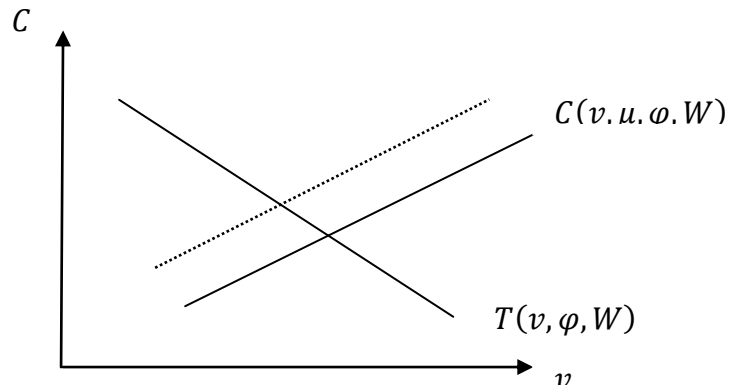
a. Labour time crowding out dominates $(\varepsilon_{Tv} < 0 < \varepsilon_{Cv})$
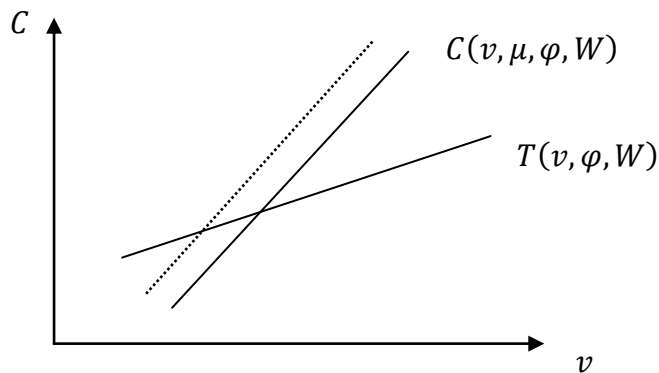
b- Protection against rent seeking dominates $(0 < \varepsilon_{Tv} < \varepsilon_{Cv})$

Two main results can be deduced from these graphs:

- there is negative relationship between material consumption and bridging social capital (v) when the labor time crowding out effect dominates and the slope of T is negative,

- in the lower panel, T slopes rise, both consumption and social capital fall

In fact, the negative and positive effect of materialism (as measured by a change in C) on the economy will only depend on the relative strength of the crowding-out effect and

protection against- rent-seeking effect. Also, any rise of the family ties preference parameter f can decrease bridging social capital, and is likely to hurt economic activity.

1.3. Relationship between human capital and social capital

Human capital is considered as an important factor to achieve economic growth. However, the definition and the measurement of the concept remained very broad. It is only after the publication of Becker [1974] that human capital notion tends to narrow, and its measure became appropriate for the use of the economic growth model. Ljungberg [2002] tried to explain the causal relationship between education and economic growth in Sweden for the period from 1867 and 1995. The same idea has been investigated also by Nunes [2003] for the case of Portugal between 1852 and 1995.

There is a general view that education and social capital are positively correlated and *vice versa* [Putnam, 1995; Helliwell and Putnam, 1999; Alesina and La Ferrara, 2000; Glaeser et al., 2000; Rupasingha et al., 2006]. In his seminal contribution, Knack and Keefer [1997] highlighted that the better people are educated, the better they are informed, the more open to the outside world and the better they analyze the information they collect. It also enables people to engage in society with better institutional environment that favors civic, better transfer of the information, transparency. It is considered like a platform for interaction between people, help to ameliorate the quality of life and strengthen individual relationships. It is a powerful tool of exchange of information and knowledge. "*It's not what you know, it's who you know*" (Woolcock, [1998]). In the same field, Nahapiet and Ghoshal [1998] suggest that the component of human capital consists of: human skills and knowledge, abilities of people, social relationship between people and knowing capability of a social collectivity, such as an organization. The development of human capital, therefore requires attention to these other elements like social and organizational issues. This idea has been developed later

by Gratton and Ghoshal [2003]. For them, intellectual capital and human capital also includes within it social capital and emotional capital.

Like others, Ian Falk [2000] tried to give much clearer picture on the relationship between social capital and human capital. According to him, the stock of human capital gathers both formal and informal learning, the skills and knowledge that people built through meaningful interactions between each other. In this case, social capital promotes active and sustainable learning environment. Such learning environment can develop interpersonal trust, knowledge and self-confidence between people within the society that provides a strong platform for more action and encourages decision-making working for the wellbeing of the nation.

1.4.   The place of social capital in the economic literature

It is now widely accepted that social capital is becoming increasingly important in today's workplace. It is considered as a tool with which to improve economic and organizational performance, as well as a help to build effective political and social institutions that in turn encourage confidence and civic between individuals in the society. In the following section, we will analyze the different conceptualizations of social capital concept within the economic theory literature.

1.4.1. Social capital and economic development theory

Over time, the economic literature has given us a wide range of varying and contesting definitions of the notion of development. In broad terms, this historical notion tried to explain how to evaluate the position of different countries relative to their level of income and to analyses the forces that are contribute to promoting a country's future progress. In fact, many authors, like Amartya Sen [1999], argue that it is not only economic growth that determines a

country's level of economic development but also other tangible and quantifiable factors such as access to education, healthcare and liberty of expression. Add to these, the importance of social relation and civil society into enriching lives of individuals within the community (Bousrih [2013]). Thus examining how social capital involves in the process of economic development become popular among economist.

Actually, rethinking about the problem of development led economists to incorporate other qualitative factors into economic growth paradigms (Malaga [2011]). Many argue that economic development is a normative concept; it applies within the context of people's sense of living, improvements in self-esteem and freedom from oppression as well as a greater choice (Todaro [1995]). Backhouse [1991] suggests that the term economic development is a situation of "*countries or regions which are seen to be under or less developed relative to others, and which, it is commonly believed, should, if they are not to become ever poorer relative to the developed countries*".

Therefore, the process of economic development is far more extensive than the economic growth. Apart from an increase of the production, it involves changes in composition of output, better allocation of productive resources, inequality and improvements in the standards of living. The notion of sustainable development has also received growing recognition. It became one of the main topics in modern economics. Some define sustainable development "*as a pattern of a resource used that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for the future generations. Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity*"[17].

Similarly, Brundtland Commission [1987] defines sustainable development as "*the development that meets the needs of present generations without compromising the ability of*

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[17] Network of Regional Government for Sustainable Development: http://www.nrg4sd.org/sustainable-development.

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future generations to meet their needs". Barbier [1987] suggests that the primary objective to achieve economic development is to increase the standard of living, diminish poverty all over the world through providing secure livelihoods that minimize resource depletion, environmental degradation, cultural disruption and social instability.

Caring about the Earth, Rogers [1993] defines sustainable development as "*development that does not destroy or undermine the ecological, economic or social basis on which continued development depends*". In the same way, the Organization for Economic Cooperation and Development [OECD, 1990] considers sustainable development as "*a concept that constitutes a further elaboration of the close partnership between the environment and the economy, within which a key element is the legacy of environmental resource, which is not excessively diminished*".

Holdren et al. [1995] stated that "*a sustainable process or condition is one that can be maintained indefinitely without progressive diminution of valued qualities inside or outside the system in which the process operates or the condition prevails*". Goodland [1995] suggested that sustainable development should integrate three types of sustainability: environmental, economic and social sustainability. According to him, environmental sustainability refers to the maintenance of life-support systems. Economic sustainability is defined as maintenance of economic capital. Social sustainability refers to the maintenance of social capital. All these three represent sustainable economic development.

In view of the present literature, the concept of economic development seems largely to be a subjective issue that requires further effort to understand how qualitative factors can influence the sustainability of the economy.

As we mentioned earlier, the concept of social capital gained popularity with the publication of Bourdieu [1980, 1986], Coleman [1988, 1990], Putnam et al. [1993], and Putnam [1995]. In fact, Bourdieu introduced the idea of social capital as "*the sum of the*

resources, actual or virtual, that individual or group accumulates by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition". He also added, that individual social capital attribute "*depends on the size of the network of connections that he can effectively mobilize*". The above argument was later developed further by Coleman [1988]. According to him, "*Social capital is defined by its function. It is not a single entity, but a variety of different entities, with two elements in common: they all consist in some aspect of social structures, and they facilitate certain actions of actors within the structure*".

Therefore, it is with these numerous definitions that the concept of social capital becomes the principal topic during the 90s. Like others, Putnam, Leonardi and Nanetti [1993] gave a macroeconomic dimension of social capital. They concluded that there is a close link between the quality of social and political institution and economic performance. They suggest that social capital is "*features of social life-networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives*".

The widespread literature relative to the effect of social capital on economic growth and later on economic development supposes that physical capital accumulation improves cooperation between economic actors and reduces transaction costs. According to Knack and Keefer [1997] lower trust can discourage innovation. In this context, entrepreneurs must devote more time to monitoring possible malfeasance by partners, employees and suppliers and spend less time to devote to innovation for new products or processes. Therefore, individuals in societies with high trust and norms of civic cooperation spend less time protecting themselves from being exploited in economic transactions and to divert resources in order to protect them. In this case, the cost of monitoring and enforcing contracts are likely to be lower, raising the payoffs to many investments and other economic transactions. In the

same context, Becker [1974] raised the point that generally people rationally invest in social networks and relationships in order to maximize their utility function.

Likewise, Granovetter [1985] insists on the importance of social network for generating confidence between economic actors and discouraging opportunistic behaviors and selfishness which will impact positively on economic performance. Therefore, social capital constitutes an input in the production function by facilitating collaboration between individual interests in the achievement of increased output and reducing of the transaction costs [Paldam and Svendsen, 2004, Routledge and von Amsberg, 2003, Torsvik, 2000, Zak and Knack, 2001].

In the same field of economic development, there is a substantial literature which focuses attention on the virtue of social capital to improve the institutional environment. Olson [1982] and North [1990] suggested that there is a close link between social capital and the quality of incentives and formal institutions. In other words, Knack and Keefer [1997] argued that institutional reforms which provide better formal mechanisms for the reliable enforcement of contracts and access to credit are even more important where trust is higher. In this case, institutions not only consist of the rights, obligations and responsibilities enjoyed and harbored by their members, but also dependent on the extent to which members trust one another to fulfill their roles (Zak and Knack [2001] and Dasgupta [2000]).

1.4.2. Social capital and institutional theory

As quoted by Williamson [2000] "*the confession is that we are still very ignorant about institution. The assertion is that the past quarter century has witnessed enormous progress in the study of institutions in the economic literature*". In fact, the process of economic development has witnessed important insights from the economic literature on organizational and institutional theory and its association with economic growth (Levine [1997] and Shleifer

et al. [2003]). Nevertheless, this literature failed to demonstrate how the institutional system can impact the process of economic activity and performance, at the same time, to show how growth can help the development of institution in the country. To address these issues many authors of the new institutional economic literature tried to analyze the institutionalism concept within the broader field of neoclassical economic theory (Williamson [2000]; Menard and Shirley [2005]). The new institutional economics with its multidisciplinary approach, using organizational theory, economics, industrial theory, political science and law, gave another dimension to the neoclassical economic theory and suggested that transactions have positive costs unlike the neoclassical economic principle of market with zero transaction costs (Menard and Shirley [2005], North [2005], Williamson [2008]). In fact, the new institutional economic literature made a new forward stride in the conventional neo-classical economic literature and showed that differences in economic performance between countries can be explained by difference in the process of economic change. Moreover, analyzing the role of institutions in the economy in facilitating coordination among economic actors can help policy makers to assess the degree of economic uncertainty related to market mechanisms (North [1990]) that can affect economic performance and growth (Williamson [2000]; Menard [2004]; North [2005]). Furthermore, Williamson [2008] added another dynamic dimension to the static traditional economic theory to address the issue of social utility and individual constraints [North 2005].

1.5.   Concluding remarks

The social capital concept has thus been widely used to explain the importance of qualitative factors to increase economic growth and development of the country. The basic idea of social capital is that it improves the communication between individuals, generates confidence and cooperation that can later benefit the people, in particular, and the community in general.

From an individual perspective, social capital is perceived as a resource built through personal relationship, social network and communication that can generate return in the future. The communitarian view equates social capital to an asset that has a positive effect on the community wellbeing. Such approach argues that the relationship between or within a group at different levels in the society shapes the prospects of the social environment that will impact positively on the economic development. Moreover, a clean social environment where people meet frequently is an ideal ground for the adoption and diffusion of good norms and trust. This concept offers a richer explanation of the economic development process. In this respect, development is as well a matter of knowing how to maintain good strategy and to sustain economic well-being over time. Besides the increase in the output, economic development process involve changes in other social qualitative factors like interpersonal trust between people that will ameliorate people's sense of living in the community.

In fact, throughout the first chapter we tried to present the conceptual understanding of the notion of social capital and its importance for economic activities. By analogy with human and physical capitals, social capital enhances individual productivity by facilitating cooperation between people and providing healthy work environment with mutual trust among individual. To analyse more how confidence and cooperation between people, as a measure of social capital, can have an impact on economic performance and later on the improvement of the people well-being, we will try in what follow to explain the different transmission channels through which such notion of interpersonal trust and confidence between people within the community can impact positively the economic performance.

Chapter II

Social capital and economic growth: empirical investigation on the transmission channels

2.1. Introduction

After the publication of the seminal contribution of Putnam et al. [1993] on the role of social infrastructure on the regional growth performance in Italy, growing attention has been devoted to this issue. At the end of the 1990s the growth literature has witnessed a plethora of contributions on the possible link between a generalized diffusion of trust, capital accumulation and development patterns (Bénabou [1996]; Barro [1996]; Knack and Keefer [1997]; Temple and Johnson [1998]; Whiteley [2000]; Zak and Knack [2001]; Gradstein and Justman [2002]). The main feature of this literature is that agents' behavior always depends on qualitative factors such as social and cultural norms in the sense that trustworthy relationships and a cooperative climate are as important as the classical inputs and can generate positive externalities in the production process. This new direction in development economics introduces a new way of research trying to fill the gap that separates sociological and economic actions.

However, despite the volume of empirical investigations of the effects exerted by social aspects, and social capital, on economic activity, there are no studies, to our knowledge, which have revealed the transmission channels by which social capital impacts economic growth. Our empirical analysis shows that social capital generally has positive and significant correlation with GDP per capita but that social structure may also have indirect effects on real economic activities through other variables that affect growth.

The principal aim of this chapter is to test empirical the hypotheses of direct and indirect effects of social capital on the growth rate of real GDP capita for a sample of 85 countries and sub set of countries with different levels of income and institutional quality during the period 1980–2009. For that, we use a seemingly unrelated regressions model as a helpful technique to analyze the interconnectedness between social capital and economic growth and to account for possible endogeneity issues.

Social capital in this chapter is measured by the level of trust computed as the percentage of individuals who trust other people and is extracted from the *World Value Survey* (WVS) database[18]. Besides the hypothesized direct effect of social capital on economic growth, the level of trust is also supposed to influence economic growth through its effect on human capital, financial development, capital accumulation and the quality of institutional development.

The main results of the chapter are as follows: *first*, the level of trust as a measure of social capital is significantly correlated with economic growth; *second*, the same level of trust exerts an indirect effect on GDP per capita income growth through the financial development, human capital, investment and institutional quality; *third*, these results are found to be robust since the sensitivity analysis conducted with the Extreme Bound Analysis (EBA) corroborates the fact that indirect effects are also as important as direct ones.

The rest of the chapter is structured as follows: Section two presents the recent empirical contributions to the debate. Section three looks at the transmission channels of social capital. In section four we present estimates of the direct and indirect effects of social capital. Section five tests the robustness of the results. Finally, section six pulls together the main conclusions of the chapter.

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[18] For more details please see page 52.

2.2. Empirical debate on social capital

The seminal contribution to the literature on the social capital and growth nexus during the 1990s is *Making Democracy Work* by Putnam et al. [1993]. In this most cited investigation, the authors found a positive and significant correlation between economic growth and social capital where the latter is measured by indicators representing the number of voluntary organizations, the number of newspapers' readers, voter turn-out at referenda and civic backwardness. In a later study, Helliwell and Putnam [1999], using the same indicators of social capital, showed that it has a positive impact on the long run economic growth in the Italian provinces.

Knack and Keefer [1997] and La Porta et al. [1997] tested Putnam's hypothesis using the data of the *World Value Survey* (WVS) where social capital is measured by the level of trust in each country in the sample. Trust ratios are computed as the percentage of individuals who think that "*most people can be trusted*". Knack and Keefer [1997] found that civic norms and trust are positively and significantly correlated with economic growth in a sample of 29 countries. La Porta et al. [1997] found that the revenues of the 20 biggest firms as a percentage of GDP per capita income are also positively correlated to the level of trust in people. Zak and Knack [2001] added other countries to the first sample used by Knack and Keefer [1997] and found that trust is higher in countries with more effective and well-functioning institutions. For Beugelsdijk [2006], the *World Value Survey* (WVS) measure of social capital may be a proxy of well-functioning institutions rather than a measure of trust because of what he called "*a mismatch between the theoretical argument and the empirical operationalization of trust*". He provided a substantial empirical argument for his hypothesis using the principal component's analysis on the data concerning institutions and trust.

At a regional level, there is an association between trust and economic growth in the sense that voluntary and unpaid work in associational activity tends to promote regional

growth (Beugelsdijk and Van Schaik [2005]). Moreover, in a recent and original study, Guizo et al. [2000] tested the relationship between financial development and social capital, their basic intuition is that "*One of the mechanisms through which social capital impacts economic efficiency is by enhancing the prevailing level of trust since financial contracts are the ultimate trust-intensive contracts, social capital should have major effects on the development of financial markets*". Guizo et al. [2000] measured social capital by indicators such as electoral participation and blood donation and concluded that these indicators are significantly correlated with indicators of financial development. Finally, Hong et al. [2001] also found that in the United States people who "*know their neighbors*" tend to have higher participation in the stock market.

Beugelsdijk and Van Schaik [2005] studied a set of 54 European regions to investigate whether regional differences in economic growth may be accounted for by social capital as a generalized trust and large participation in associational activity. The different robustness tests carried out tend to confirm the positive significant relationship between regional growth and participation in associational activity. This result is considered as a generalization of the finding of Putnam et al. [1993] on social capital and Italian regions, and goes beyond to show that not only does the simple existence of network relationships boost regional growth, but it also boosts the effective involvement in these relationships.

However, in spite of the empirical literature supporting evidence of a significant positive association between the level of trust and economic growth, other studies provide empirical evidence against the existence of a robust relationship between the social capital and economic development. Such studies include Helliwell [1996], Miguel et al. [2005] and Pryor [2005]. Indeed, Helliwell [1996], using groups of Asian countries, found no significant correlation between social capital and economic growth. Similarly, Miguel et al. [2005] have found that initial social capital has no predictive power on subsequent industrial development

in Indonesia, using a data set of 274 districts and a rich set of social capital and social interaction measures, including levels of trust and informal cooperation.

2.3. Transmission channels for social capital

As it is documented in the literature social capital, measured by the level of trust in the economy, is an important determinant of *physical capital investment activity* (Knack and Keefer [1997]), *human capital* (Coleman [1988]; Israel and Beaulieu [1995]; Goldin and Katz [1999]), *quality of institutions* (Olson [1982]; North [1990]; Zak and Knack [2001]) and *financial intermediation* (Calderón et al. [2001]; Hong et al. [2001]).

2.3.1. The physical capital investment transmission channel

The widespread literature, relative to the effect of social capital on investment, supposes that physical capital investment improves cooperation between economic actors and reduces transaction costs. According to Knack and Keefer [1997] lower trust can discourage innovation. In this context, entrepreneurs must devote more time to monitoring possible malfeasance by partners, employees and suppliers and spend less time to devote to innovation for new products or processes. Therefore, individuals in societies with high trust and norms of civic cooperation spend less time to protect themselves from being exploited in economic transactions and to divert resources in order to protect them. In this case, the costs of monitoring and enforcing contracts are likely to be lower, raising the payoff of many physical capital investments and other economic transactions. It is widely accepted in the literature that social capital contributes to reduce transaction costs, enforces the link between active groups within the society and positively affects economic performance (Beugelsdijk and Van Schaik [2005]).

Moreover, the effect of social capital on physical capital investment seems to be more important to the sense that high level of confidence and cooperation between economic agents can reinforce the overall investment environment for the economy, diminish the degree of risk adverse and increase investor incentive to invest in high-tech industries, which require informal exchange of technological information and property rights (Putnam et al. [1993]). As such, high trust and cooperation between investors can be seen as an essential substitute for government-backed property right or contract enforcement.

Our analysis of the relationship between physical capital investment, measured by the ratio of gross capital formation to GDP, and social capital, measured by the Trust index, for the set of 85 countries, including developed countries and developing countries[19] is depicted in the Figure 2.1, and it confirms the general findings described above. In fact, the use of Trust index as a proxy of social capital is considered as the most-used indicator of the quality of social capital in general and the quality of social relationship that reflect the level of generalized trust for the society in particular. This measure is calculated by the World Value Survey[20], a global non-profit association, based on 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 aggregate national trust indicator is thus the percentage of respondents who answer, "*Most people can be trusted*". The survey was done for a set of persons who were asked to rate their confidence in a large number of institutions and organizations starting from the parliament, which is the central representative institution of democracies, and including government, civil service, political parties, armed forces, police, press, churches, labor unions, the justice and education systems.

It is clear that in the presence of interpersonal mutual trust, transaction and cooperation between business partners is at lower transaction cost, making economic

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[19] See appendix A.2 for the list of countries by category.
[20] World Value Survey is frequently used by governments around the world, scholars, students and international organizations and institutions such as the World Bank and the United Nations (UNDP and UN-Habitat).

activities and performance more efficient, especially in a globalized world as we live in now. This would imply that development of social infrastructure and cooperation between people help to boost economic activity. However, it is worth mentioning that the improvement of social collaboration is not only an individual decision but also a structural element within the society shaped by certain cultural values, knowledge skills, institutional development and strength as well as other social structures like religion and political system.

Figure 2.1. The relationship between social capital and physical capital accumulation in developed and developing countries[21]
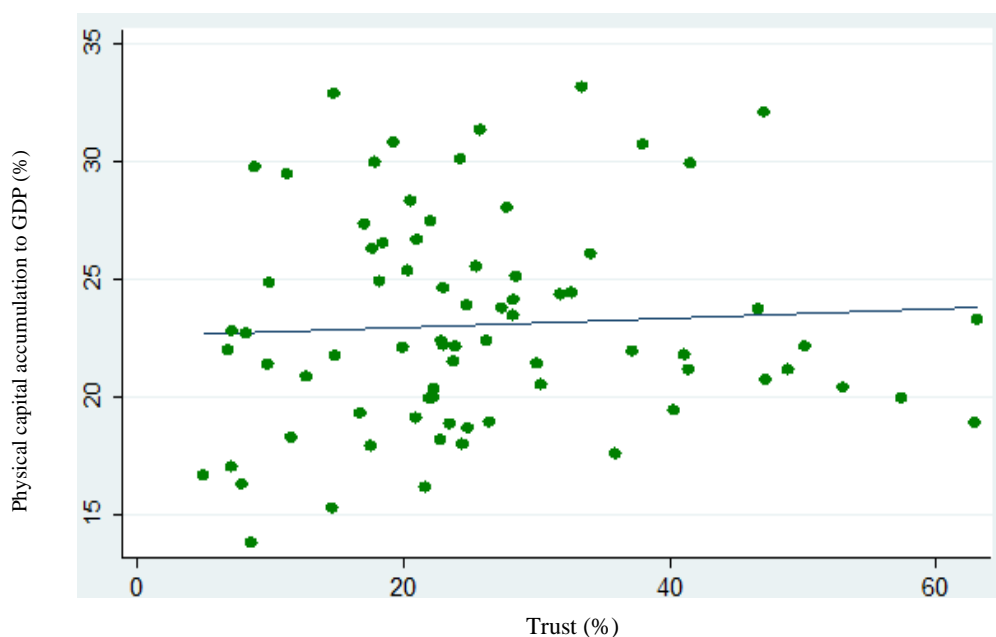
Source: Author's calculations.
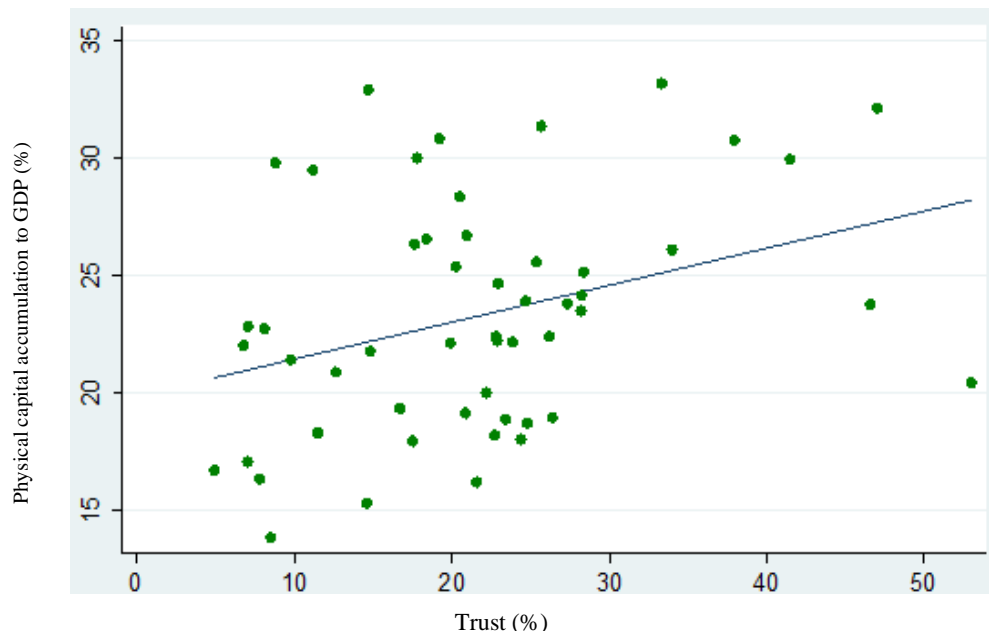
The positive relationship between physical capital investment and interpersonal trust seems to hold valid for the set of developing countries[22] (Figure 2.2a), however, it is not the

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[21] The line in all graphs of the chapter 2 represents the linear regression line.
[22] The list of developing countries used in all graphs that will flow of the chapter 2 is available in the appendix A.2.

case in the set of developed countries[23] (Figure 2.2b). Such finding is not strange in the sense that social capital in developing countries with weak formal institutional system; social capital is considered like "*glue that holds societies together*"[24]. In fact, economic system is mainly characterized by a dynamic exchange of activities that could benefit each investor in a positive direction if there is high level of trust between different business partners within the community.

Figure 2.2a. The relationship between social capital and physical capital investment in developing countries
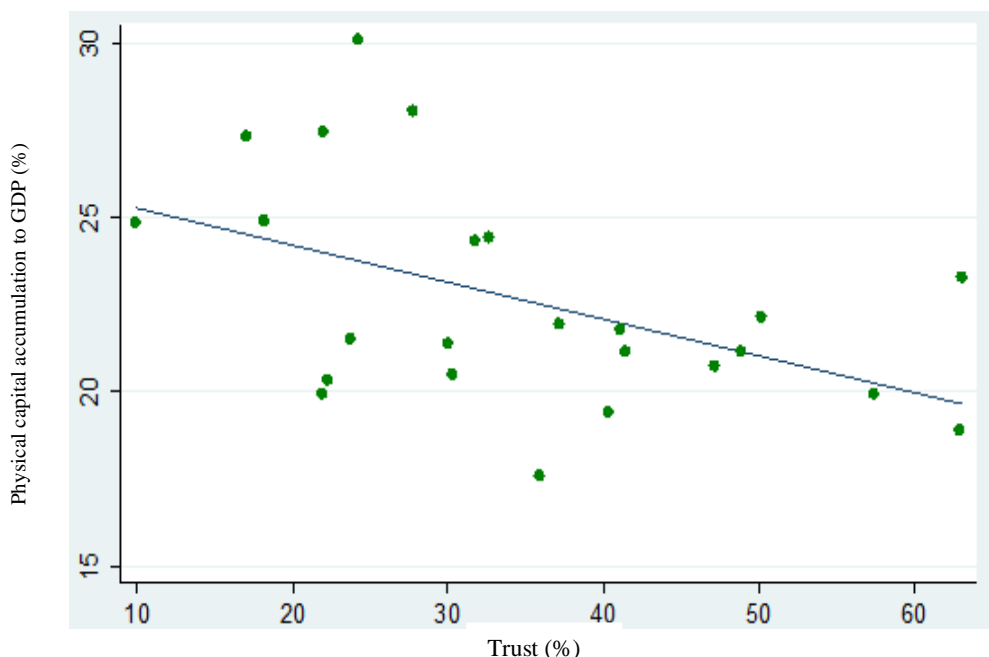

Source: Author's calculations.

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[23] The list of developed countries used in all graphs that will flow of the chapter 2 is available in the appendix A.2.
[24] World Bank [1998].

Figure 2.2b. The relationship between social capital and physical capital investment in developed countries

Source: Author's calculation.

Moving, our analyses further, in Figures 2.3a and 2.3b we tried to examine the relationship between social capital and investment for a group of 28 countries with high control of corruption compared with a group of 54 countries with medium and low control of corruption[25]. The choice of level of corruption as an indicator of the quality of institutional environment is based on the fact that in the presence of weak institutional and regulatory system corruption can be used as a tool to twist legal and regulatory obligations in favor of who is in a better position in the society. Such practices can be harmful to the efficiency of services delivered by public sector and affect people as well investors' trust in organization well functioning. In countries where uncertainty and untruthfulness in the organization functioning are high and have characterized by medium to low control of corruption, people rely more on the level of interpersonal trust in the community, as a substitute, to facilitate

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[25] See appendix A.1 for the group of countries by category.

their economic activities. This is not the case in the group of countries with high control of corruption and has higher quality of formal institutional system.

Figure 2.3a. The relationship between social capital and physical capital investment in countries with high control of corruption
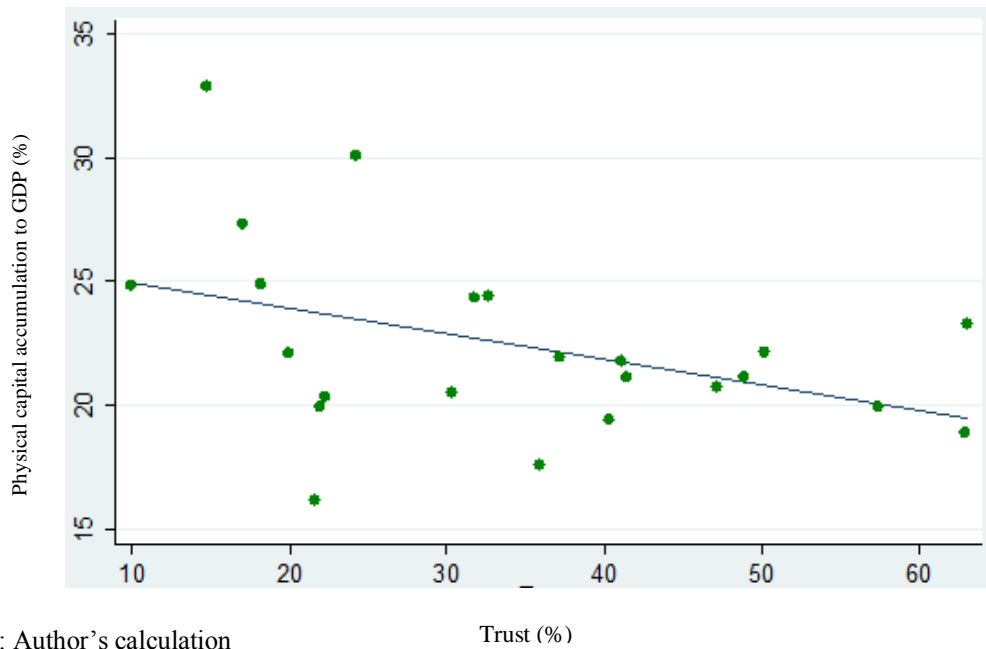
Figure 2.3b. The relationship between social capital and physical capital investment in countries with medium and low control of corruption
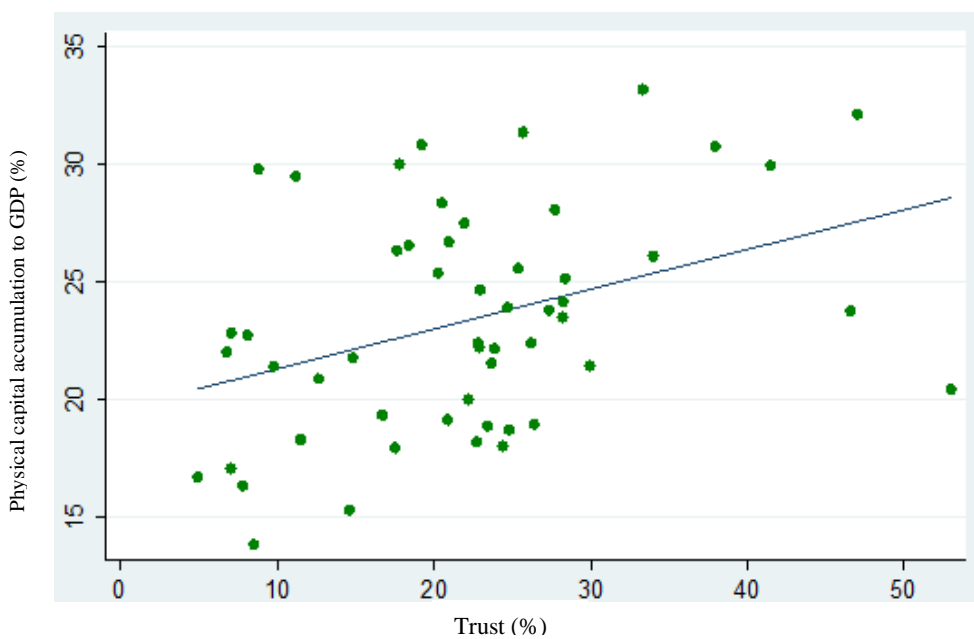
2.3.2. The Human capital transmission channel

The second transmission channel deals with the relationship between social capital and human capital. In his seminal contribution, Coleman [1988] argued that communities rich in trust, and social connections achieved low rates of high-school dropouts. According to him, social capital contributes to human capital. Moreover, Coleman "*identified the social capital inherent in parent-child relations and in the strong family-school-community links among those who sent their children to parochial schools as conducive to better educational outcomes*".

Israel and Beaulieu [1995] also examined the role of social capital in promoting educational achievement among American high-school students and found that social, human and financial capital of their families all had significant impacts on school dropout probability. This relationship has been investigated by Buchel and Duncan [1998] for the case of Germany and by Bjørnskov [2009] for a sample of 52 countries. The authors concluded that investment in education is relatively cheaper in high trust societies than in low trust societies, which have led to faster growth of schooling in the former countries. Likewise, Knack and Keefer [1997] argued that higher learning implies that individuals become better informed and better at interpreting perceived information, as well as becoming more conscious of the consequences of actions taken by themselves and others. In addition, Knack and Keefer suggested that trust between people may ameliorate access to credit for poor communities, and enrollment in secondary school, which may necessitate high fees compared with primary education.

As in the previous section, Figure 2.4 illustrates the relationship between human capital, measured by gross secondary school enrollment, collected from the World Bank database, and social capital, computed by Trust index from the World Value Survey database, for a set of 85 countries. The result shows there is a positive correlation between school enrollment indicator and trust index, both have a simultaneous role in the economic activity.

Figure 2.4. The relationship between social capital and human capital in developed and developing countries
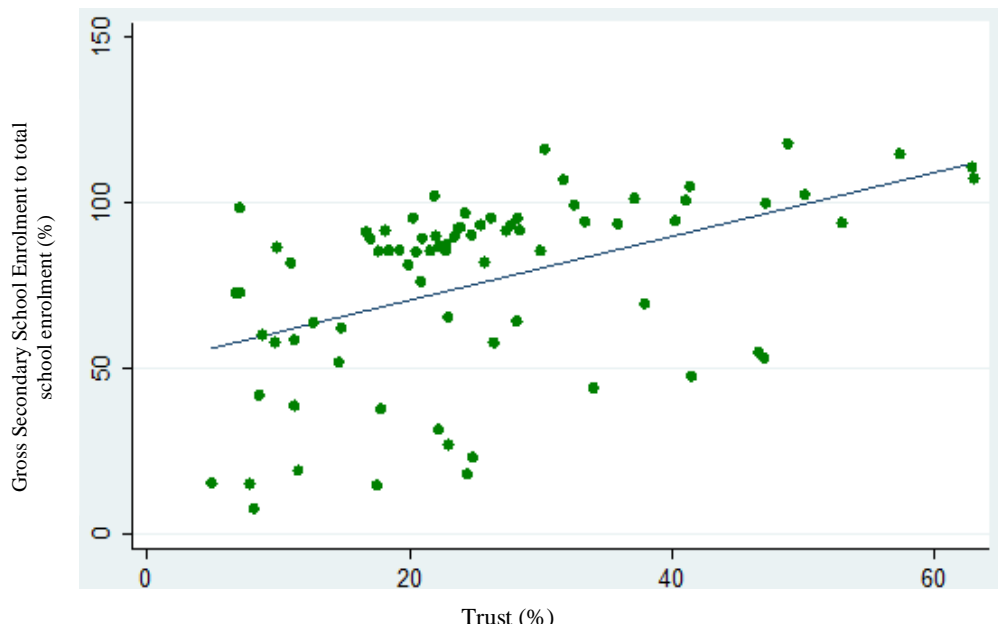
Source: Author's calculations.

In fact, well-educated population is an important asset for the economic well-being of the community. Similarly, good civic network and well-functioning institutions play a crucial role into sharing information, knowledge, and respect of rules.

It is also evident that social capital within the family can be beneficial to the children in the sense that it can give them access to their parent human capital at early age, at the same time teach them the culture of learning, develop their aspiration base, communication and sharing knowledge between each other. In addition, network may be beneficial for the youth because it gives them access to diversity of learning experiences of mature people (Bofota [2012]).

This positive connection between human capital and social capital is also confirmed for the set of developing countries and developed countries (Figures 2.5a and 2.5b). At the same time it is still robust for the set of countries with the different levels of institutional

quality[26] (Figures 2.6a and 2.6b). Such finding is evident because social capital is kind of asset that individuals accumulates over time starting from their early age when they are still with their family and build up through life experiences.

Figure 2.5a. The relationship between social capital and human capital in developing countries
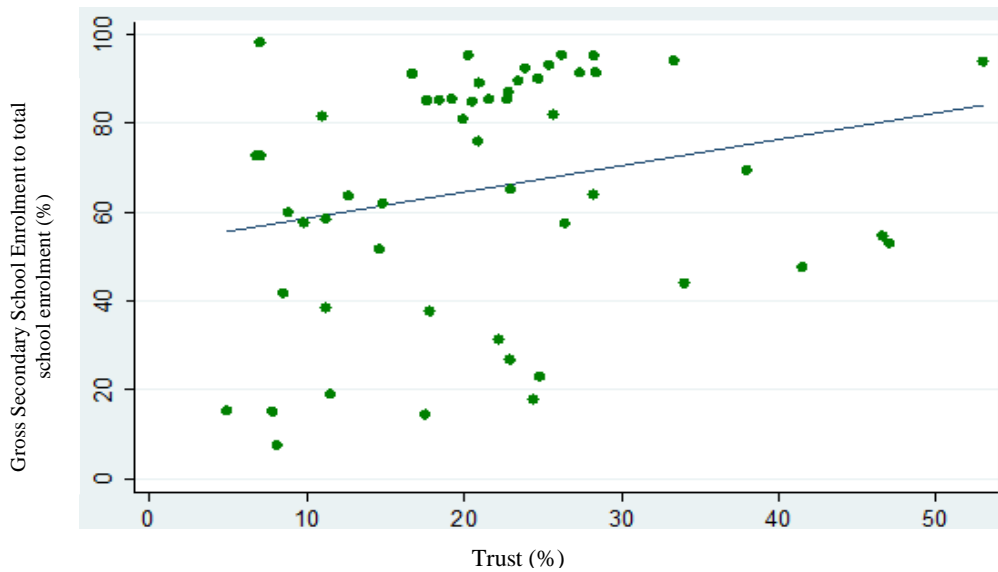
Source: Author's calculations.

Figure 2.5b. The relationship between social capital and human capital in developed countries
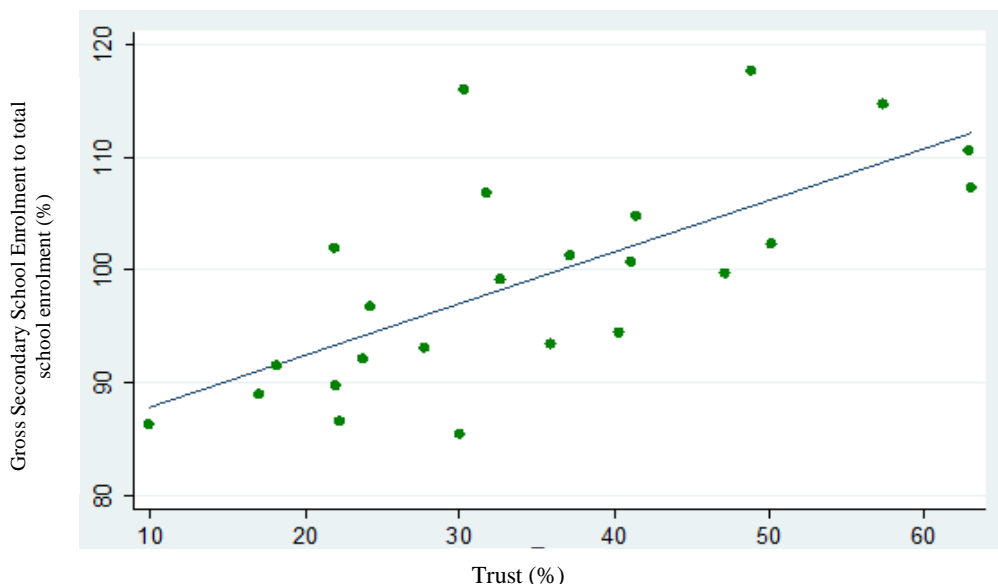
Source: Author's calculations.

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[26] See appendix A.2 at the end of the work for the list of countries by category.

Figure 2.6a. The relationship between social capital and human capital in countries with medium and low control of corruption
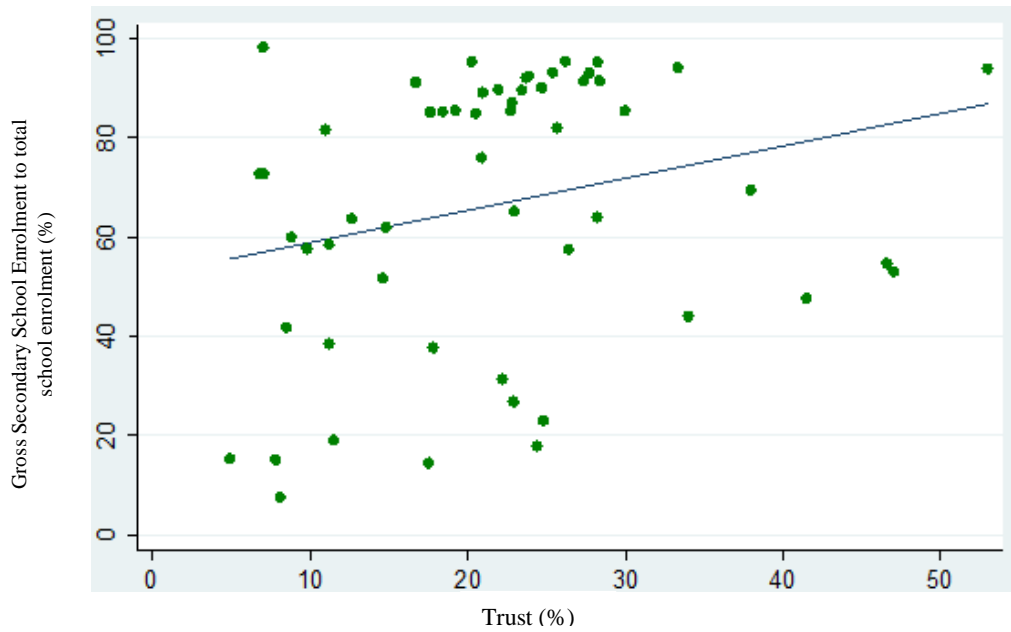
Source: Author's calculations.

Figure 2.6b. The relationship between social capital and human capital in countries with high control of corruption
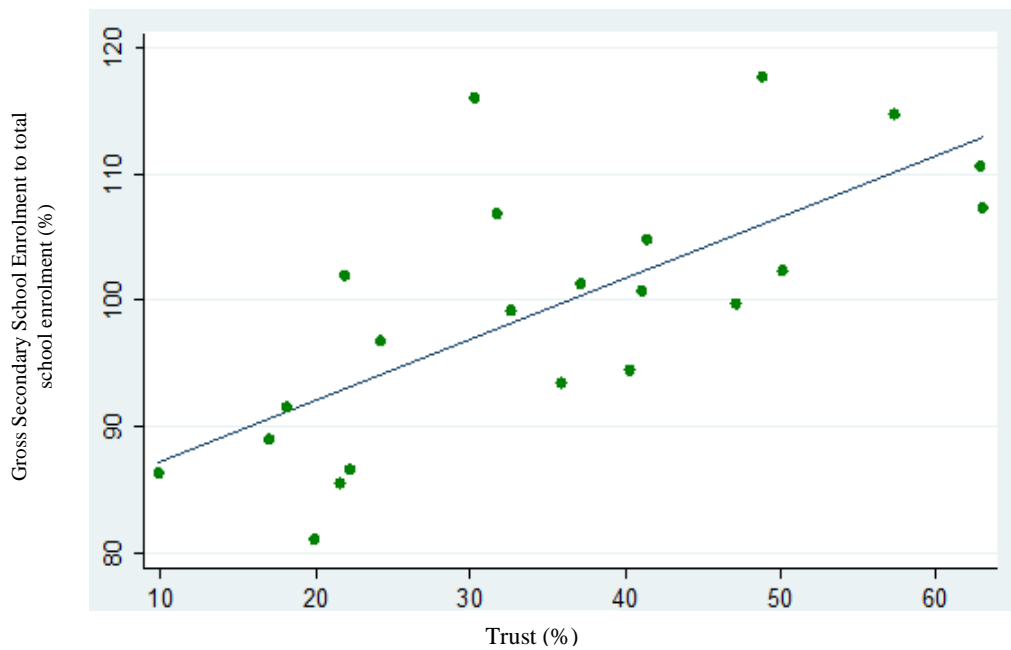
Source: Author's calculations.

2.3.3. The institutional quality transmission channel

In the field of economic development, there is a substantial literature which focuses attention on the virtue of social capital to improve the institutional environment. Olson [1982] and North [1990] put the concept of social capital within the realm of institutional economics, which posits that the quality of incentives and institutions (such as rule and law, the judicial system or the quality of contract enforcement) is a major determinant of economic growth. Similarly, Knack and Keefer [1997] argued that institutional reforms provide better formal mechanisms for the reliable enforcement of contracts and access to credit and that these are even more important where trust is higher. In this case, institutions do not only have the rights, obligations and responsibilities for their members to enjoy, but are also dependent on the extent to which members trust each other to fulfill their roles (Zak and Knack [2001]; Dasgupta [2000]). Highlighting all these lead us to think whether social capital is a substitute or a complement to formal institution's development for achieving economic growth? According to Ahlerup, Olsoson and Yanagizawa [2009] "*trust, social norms, and civic activity are seen to be fundamental aspects of the well performance of economies activity but at the same time formal rules and laws are also crucial factor for development*". Therefore, having both good social environments with high trust between people in the communities, complemented with strong institutional environment, will certainly increase economic activity and boost sustainability of the economic development. In fact, institution provides a formal structure of interaction between people, while social capital grants trust and loyalty of people.

Our stylised fact analysis of the relationship between the institutional quality indicator, measured by the index of institutional quality collected from the World Bank database and calculated by Kaufmann et al. [2010], and the level social capital, measured by the trust index collected from the World Value Survey database, reveals that these two concepts are positively related. It is worth mentioning that the institutional quality index used to examine

this connection is a composite of different indexes such as voice and accountability, political stability, government effectiveness, property right and rule of law and control of corruption. As it is shown in (Figure 2.7) society with a high level of trust and loyalty between people has a good institutional environment, measured by the institutional quality index, where individuals obey law and respect rules that will have a positive impact on economic activity and later on long-term economic growth and development.

In fact, social capital can make people to act together for the best of the community, and to obey the law. At the same time, it may enhance cooperation between bureaucrats and policy maker, as they share the same asset of social capital as the rest of the community.

Figure 2.7. The relationship between social capital and institutional quality in developed and developing countries
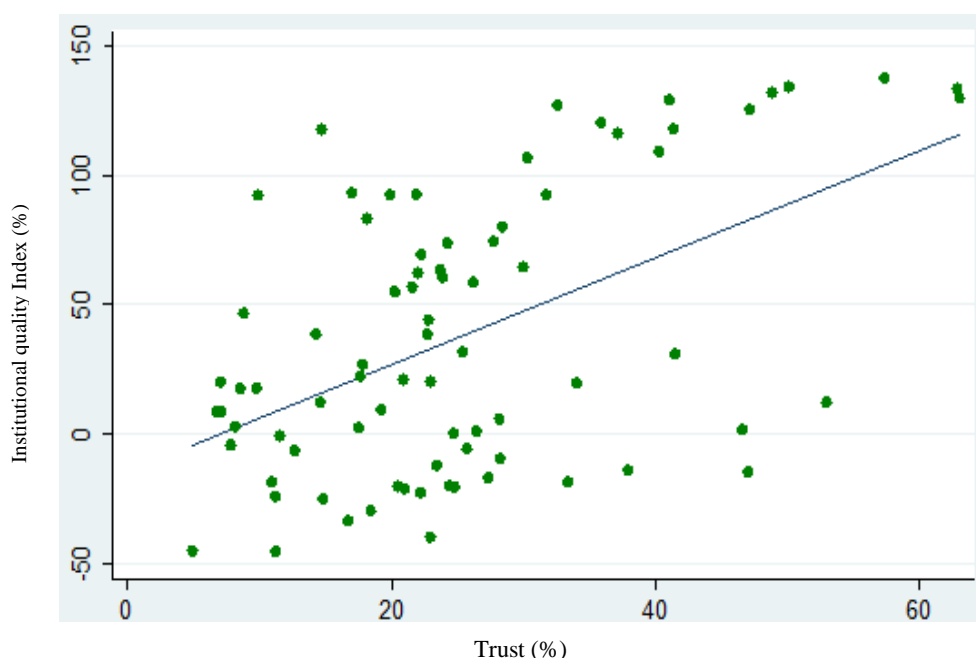
Source: Author's calculations.

Evidence that high social capital improves the effectiveness of institutions is still valid for both groups of developing (Figure 2.8a) and developed countries (Figure 2.8b). Similar

finding is also true for the both groups of countries with the different levels of institutional

quality (Figures 2.9a and 2.9b)

Figure 2.8a. The relationship between social capital and institutional quality in developing countries
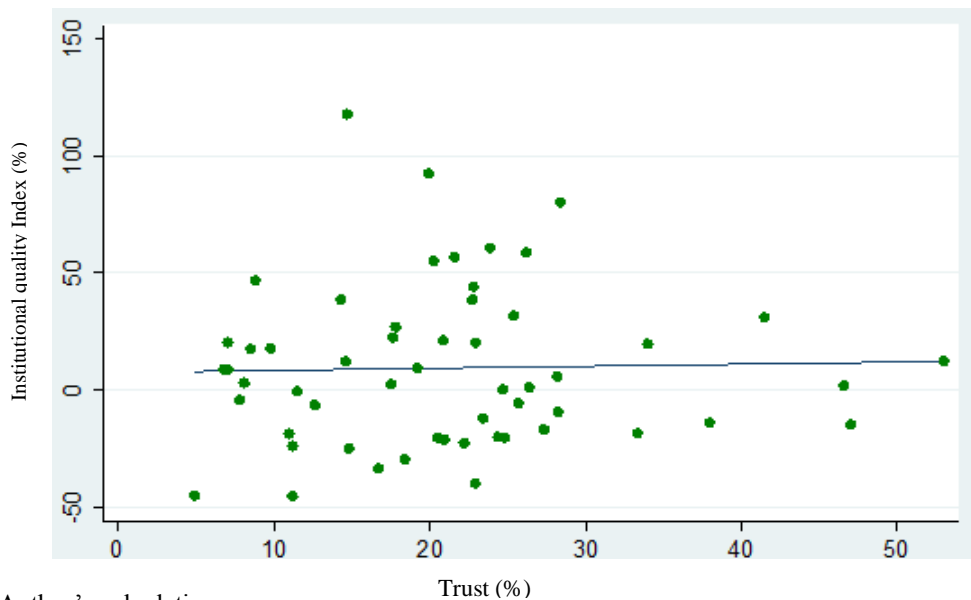
Figure 2.8b. The relationship between social capital and institutional quality in developed countries

Figure 2.9a. The relationship between social capital and institutional quality in countries with medium and low control of corruption

Source: Author's calculations.

Figure 2.9b. The relationship between social capital and institutional quality in countries with high control of corruption
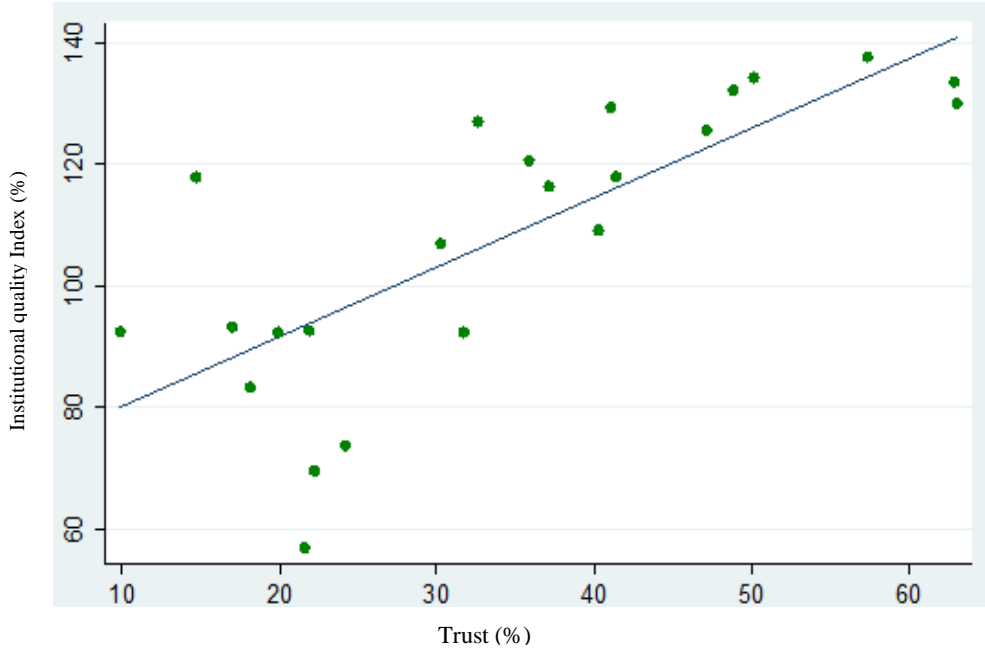
Source: Author's calculations.

2.3.4. The financial development transmission channel

Regarding financial market development, only a few papers have analyzed the role of trust in financial development (Guizo et al. [2000]; Calderón et al. [2001]; Hong et al. [2001]). In fact, Guizo et al. [2000] found that measures of trust and financial development proxies are highly correlated. In particular, their study on the north and south of Italy showed that in regions with high levels of trust, individuals have more access to credits, more participation in the stock market and less resort to informal sources of finance. Calderón et al. [2001] extended the empirical analysis to a set of countries and found evidence of a significant association of higher levels of trust with financial deepening ratios and more developed stock markets, after controlling for human capital formation and law enforcement quality. In fact, the financing activity is reduced to a credit granting with a promise to pay back the incurred amounts. The success of the financing operation will depend not only on institutional aspects (law enforceability, the quality of bureaucracy) but also on the degree of trust prevailing between the partners. In other words, the respect of the financial contract established between the *financer* and the *financee* depends, to a large extent, on the attitude of individuals to trust others. If the *financee* exchanges money with the *financer* with an implicit intention not to reimburse anything in the future, the use of financial contracts will be reduced, and this fact may entail bank insolvency and may generally lead to financial fragility situation. For Calderón et al. [2001] a low level of trust can exacerbate different kinds of risks, and they conclude "*the perceived probability of misbehavior on the borrower's behalf can be higher than there is high trust*".

It appears that in cross-country level analysis trust index, as a measure of social capital, has a positive relationship with the development of the financial sector (Figure 2.10). As the indicator of financial sector development, we have taken the ratio of liquid liabilities (broad money M2) to GDP. The examination of the effect of the level of trust in the

community on the development of the financial system across a group of developing and developed countries confirms this positive relationship (Figures 2.11a and 2.11b). The same result is also valid for a group of countries with the different levels of institutional quality (Figures 2.12a and 2.12b).

Figure 2.10. The relationship between social capital and financial development in developed and developing countries
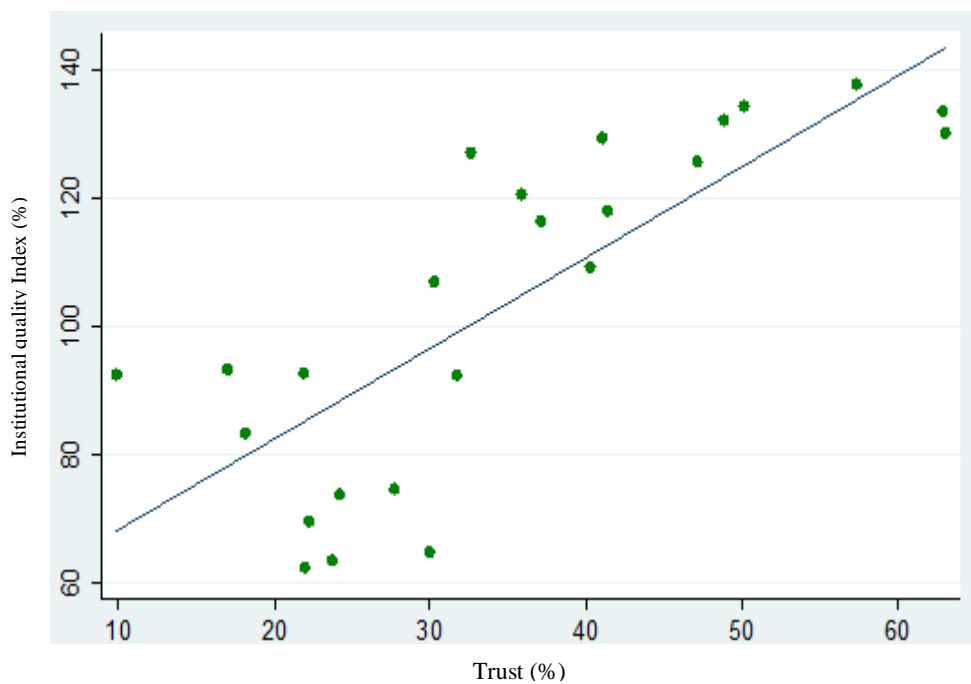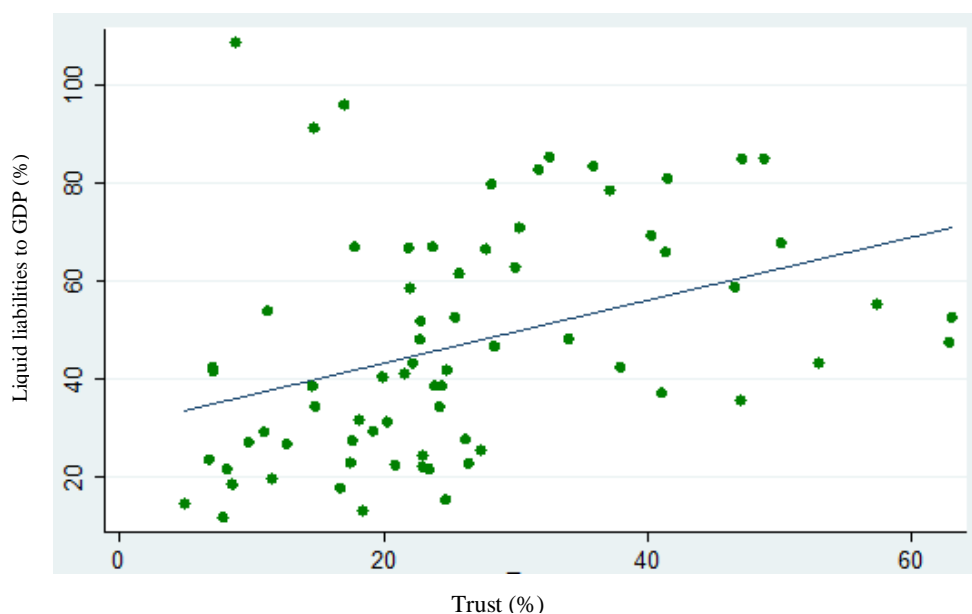

Source: Author's calculation.

Figure 2.11a. The relationship between social capital and financial development in developing countries
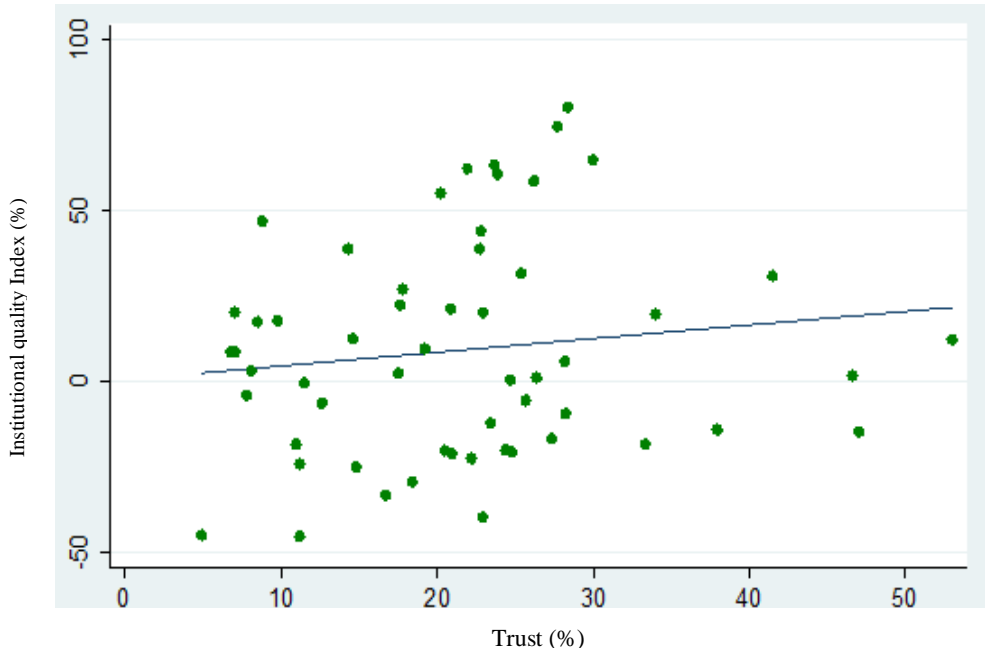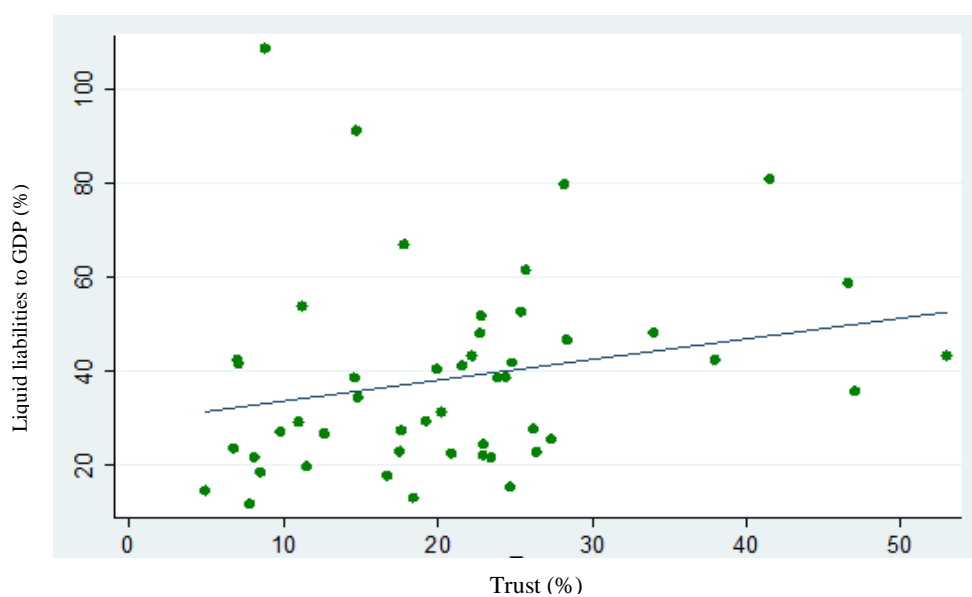

Source: Author's calculation.

**Figure 2.11b. The relationship between social capital and financial development in developed countries**
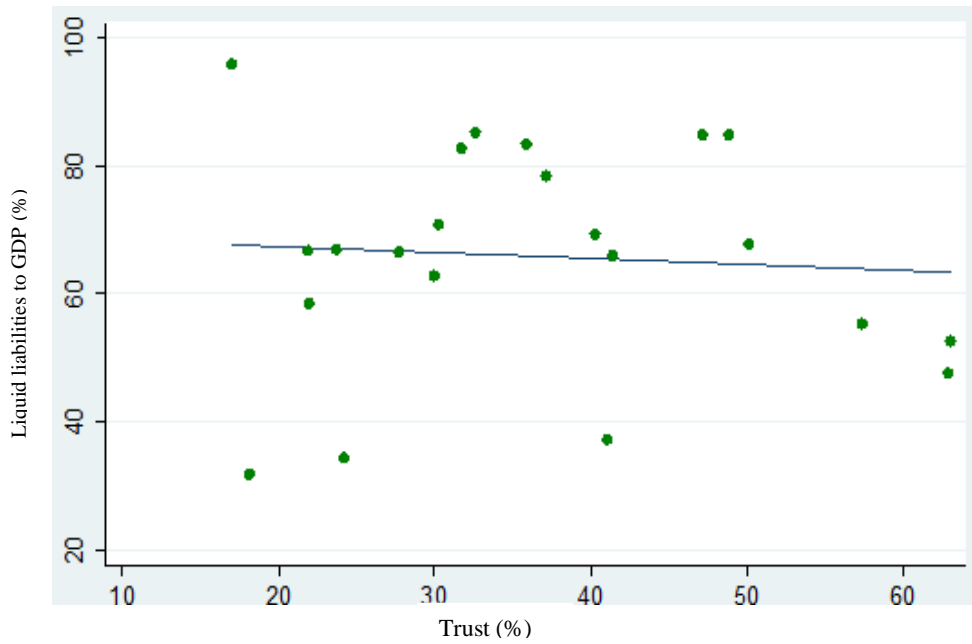
Source: Author's calculation.

Figure 2.12a. Social capital and financial development by groups of countries with medium and low control of corruption
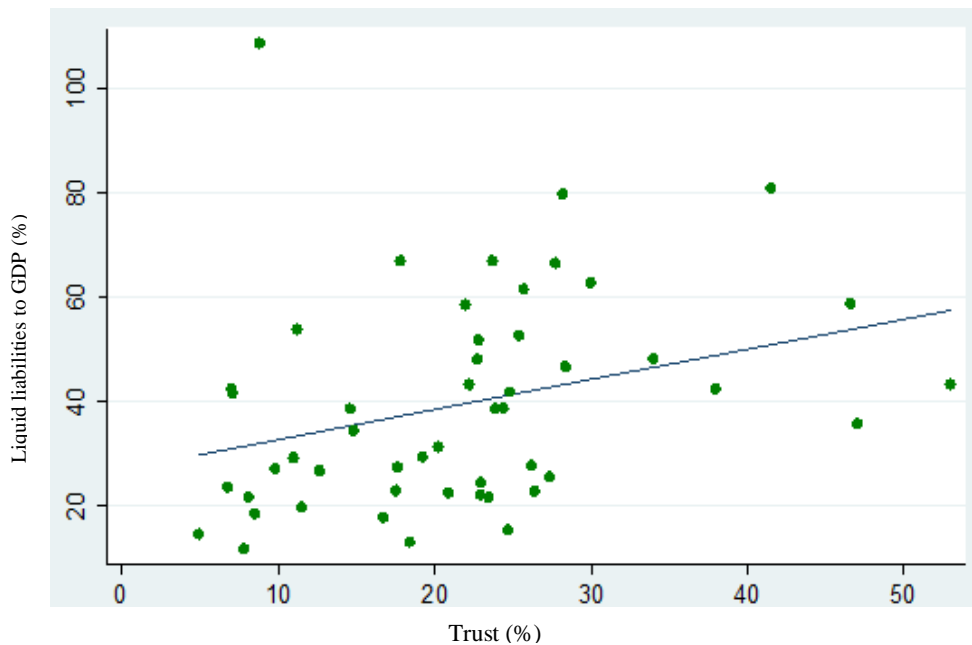
Source: Author's calculation.

Figure 2.12b. Social capital and financial development by groups of countries with high control of corruption
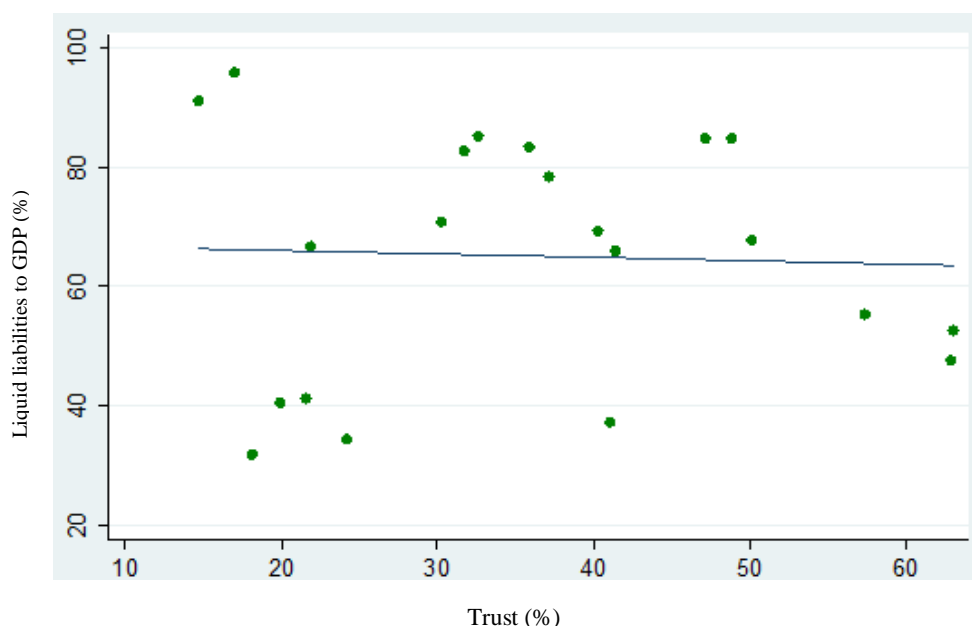
Source: Author's calculation.

2.4. Seemingly unrelated regressions model

As discussed previously, the basic idea of social capital is that individual values and trust into collective actions tend to generate positive return to the economy. To analyze empirically the relationship between economic growth and individual trust, in this section will develop seemingly unrelated regressions model. Two motivations for use of the seemingly unrelated econometric model: the *first* is that there is a conceptual relation between the two dependent variables introduced in each equation of the system, which are the average growth rate of real GDP per capital and the social capital indicator. The *second* is that by combining the information in the different equations we can have more accurate and efficient result in terms of transmission channel effects of trust between people in the community to the economy. In the model we used a sample of 85 developed and developing countries[27] for the period 1980–2009.

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[27] See appendix for the list of countries. The number of countries used in the regression was limited to data availability of Trust index.

The dependent variable is the average growth rate of real GDP per capita $G_Y^i = \frac{1}{T} ln \frac{Y_T^i}{Y_0^i}$ and the independent variables are: the logarithm of initial GDP per capita $ln(Y_0)$, the social capital indicator, measured by *"the percentage of people trust each other in the country"* $Trust$, collected from a survey of the World Values Survey(WVS)[28]. The set of other explanatory variables TC[29] contains human capital, measured by the average secondary school enrollment HK, the average gross capital formation to GDP ratio IY, financial development, measured by the average ratio of liquid liabilities to GDP FD, the institutional quality environment measured by index introduced and calculated by Kaufmann et al. [2010][30] IQ. Table 2.1 summarizes the list of variables used in the model and contains also additional information on the number of observations, mean, standard deviation and the minimum and maximum of each of the variables across countries.

Table 2.1. Descriptive statistics

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
G_Y	%	85	2.32	1.77	-1.65	8.60
Y_0	US$	85	10099.56	8636.09	231.59	29750.80
$Trust$[31]	%	85	26.84	14.26	4.90	63.05
HK	%	83	77.44	28.56	7.51	148.46
IY	%	82	23.40	4.75	13.81	40.07
IQ	%	85	41.57	55.28	-45.53	141.28
FD	%	76	52.41	35.09	11.98	218.94

Source: Author's calculation.

Following Barro and Lee's [1994] approach, the stylized form of the economic growth equation can be written as follows:

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[28] For more detail see page 52.

[29] All explanatory variables used in the model were logarithmized.

[30] This aggregate indicator combines the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. They are based on 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms

[31] Average value of trust index for the period 1980-2009.

$$\begin{cases} G_Y^i = \alpha_{0+} \alpha_1 ln\left(Y_0^i\right) + \alpha_2 Trust^i + \theta TC^i + \varepsilon^i, & (2.1) \\ TC_j^i = \beta_{0,j} + \beta_{1,j} Trust^i + \mu_j^i, & (2.2) \end{cases}$$

where: superscript i correspond to a given country in the sample. TC refers to the vector of proposed transmission channels, which are: human capital HK, investment ratio IY, financial development FD and the institutional quality IQ. The parameters β_0 and β_1 are four-dimensional vectors of coefficients representing, respectively, the constants and the effect of social capital on each transmission channels. θ is four dimensional vector of parameters by the four variables describing the transmission channels. ε^i and μ^i are the vectors of the residual term[32]. The subscript j refers to the different transmission channels of social capital which are HK, IY, FD, IQ and the subscript i denotes the ith country. The variables are extracted from the Penn World Tables [2010], World Development Indicators, International Financial Statistics, Kaufmann et al. [2010] institutional indexes and the World Value Survey (WVS)[33].

The estimation of equation (2.1) using the econometric software STATA, and reported in the Table 2.2, reveals that the estimated coefficient of the initial real GDP per capital is negative and significant at 99% level of confidence which confirm Mankiw, Romer and Weil's [1992] hypothesis of convergence in standards of living between poor and rich countries. Investment, human capital and institutional quality yield positive and significant coefficients at the 99% and 95% levels of confidence, respectively. However, the estimated coefficient of financial development is positive but not significant. In the case of the level of trust it is positively and significantly correlated with economic growth at the 95% level of confidence. This means that, the level of trust confers beneficial effects on growth at the 5%

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[32] In the seemingly unrelated regression it is assumed that the error terms in the subsequent regressions can be dependent, although they are serially independent (i.e. error terms for different observations are independent).
[33] The list of variables, descriptions, and correspondent sources are given in the appendix B at the end of the work.

level of significance. This result goes in line with previous studies on social capital. For example, in Knack and Keefer [1997] a one standard deviation increase in the prevailing level of trust is associated with a rise in economic growth of more than one half of a standard deviation. Similarly, according to Zak and Knack [2001] the economic growth rises by approximately 1% on average after a 15% increase in trust. A robust result was also found in Beugelsdijk et al. [2004], and Bousrih et al. [2008] using the extreme bound method[34].

Table 2.2. Gross domestic product growth equation estimate in developed and developing countries

Independent variables	Estimated coefficients
Constant	1.052 (0.66)
Y_0	-1.107*** (-6.48)
Trust	0.476** (2.51)
IY	1.237** (2.18)
FD	0.315 (1.41)
HK	0.842*** (3.00)
IQ	0.007** (2.48)
Observations	60
R^2	0.59
F-Stat	12.86***

Notes: the dependent variable is the annual real GDP per capita growth rate.
Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

Nevertheless, to our knowledge, all these contributions have not explicitly studied the transmission channels of social capital to economic growth. The purpose of this chapter is to focus the analysis on these aspects by studying the relative contribution of each determinant of economic growth.

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[34] See section five for more details on the method.

The estimation of the second equation of the system (2.2), carried out in the Table 2.3 shows that the trust index, as a measure of social capital, has a positive and significant interdependence with human capital, financial system development and institutional quality at the 1% level of significance. Interpersonal trust between people in the community also plays a significant role in the well functionality of business. The estimated coefficient of investment indicator is positive and significant at the 5% level of significance.

Table 2.3. Transmission channels equation estimate in developed and developing countries

Independent variables	Dependent variables			
	HK	FD	IQ	IY
Constant	2.500*** (7.06)	2.228*** (7.05)	-127.661*** (-4.37)	2.828*** (23.65)
Trust	0.523*** (4.77)	0.517*** (5.29)	55.926*** (6.18)	0.083** (2.25)
Observations	60	60	60	60
R^2	0.28	0.32	0.39	0.08
F-Stat	22.77***	27.93***	38.23***	5.07**

Notes: Figures in parentheses represent values of calculated Student's t-statistics.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

To analyze deeply the complementarities between social capital and each of the determinants of economic growth we will try to examine whether the positive relationship between institutional quality environment, trust, human capital, financial development and economic growth remain valid for a group of countries with strong institutional environment and another group with weak institutional environment[35].

Indeed, in this approach, we use the World Bank indicator of governance measured by control of corruption index defined by "*the degree to which corruption is perceived to exist among businesses, public officials and politicians*". Countries with ranking above 50th

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[35] See appendix A.1 for the list of countries.

percentile are considered strong institutional environment with high control of corruption, and countries with ranking lower than 50th percentile specify weak institutional environment and with medium and low control of corruption. The Table 2.4 presents the descriptive statistics for the list of variables used in the system for both groups of countries with the different levels of institutional quality.

Table 2.4. Descriptive statistics by group of countries with different levels of institutional quality

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
Group of countries with high control of corruption						
G_Y	%	27	2.10	0.73	0.99	4.21
Y_0	US$	27	18429.32	6503.46	5120.62	29750.80
$Trust$	%	27	35.64	14.63	9.90	63.05
HK	%	26	100.21	14.47	75.18	148.46
IY	%	27	22.97	3.79	16.16	32.90
IQ	%	27	106.88	24.13	56.82	137.62
FD	%	25	78.40	44.22	31.70	218.94
Group of countries with medium and low control of corruption						
G_Y	%	58	2.42	2.08	-1.65	8.60
Y_0	US$	58	5020.43	5100.08	231.59	19723.43
$Trust$	%	58	22.75	12.17	4.90	57.46
HK	%	57	67.05	27.40	7.51	112.89
IY	%	55	23.62	5.18	13.81	40.07
IQ	%	58	11.17	35.75	-45.53	141.28
FD	%	51	39.67	20.12	11.98	108.49

Source: Author's calculation.

The result from the estimation of equation (2.1) for the group of countries with high control of corruption, and presented in the table 2.5, shows that the coefficient of social capital measured by "trust index" is positive and significant at 5% level of significance. However, the estimated coefficients of financial development, human capital and institutional quality are negative and not significant. This mixed results support the view that countries with strong institutions can build mutual trust between individual and regulatory authorities,

promote transparency and long-term economic growth. Similarly, the convergence hypothesis is respected in the model. The coefficient of the initial real GDP per capita is negative and significant at 1% level of significance, and is consistent with the work of Mankiw, Romer and Weil [1992]. Investment remains the engine of economic growth as the estimated coefficient of investment reveals the positive link between this variable and the economic growth rate.

Table 2.5. Estimated gross domestic product equation for a group of countries with high control of corruption

Independent variables	Estimated Coefficients
Constant	6.134 (1.33)
Y_0	-1.104** (-2.50)
Trust	0.894** (2.12)
IY	1.382 (1.42)
FD	-0.036 (-0.09)
HK	-0.041 (-0.04)
IQ	-0.005 (-0.63)
Observations	22
R^2	0.54
F-Stat	3.00***

Notes: the dependent variable is the annual real GDP per capita growth rate.
 Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

In the Table 2.6 we present results of the tested relationship between trust index and each of the transmission channels. The output of the estimated equation (2.2) shows a strong positive association between social capital and human capital and institutional quality.

Table 2.6. Transmission channels equation estimates for group of countries with high control of corruption

Independent variables	Dependent variables			
	HK	**FD**	**IQ**	**IY**
Constant	3.963*** (14.07)	4.024*** (4.02)	-42.042 (-1.07)	3.082*** (9.85)
Trust	0.179** (2.32)	0.07 (0.28)	42.328*** (3.93)	0.001 (0.02)
Observations	22	22	22	22
R^2	0.21	0.003	0.43	0.001
F-Stat	5.40**	0.08	15.47***	0.001

Notes: Figures in parentheses represent values of calculated Student's t-statistics.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

Similar results appear to be valid in the group of countries with medium and low control of corruption. The different regression carried out in the Table 2.7 confirms the importance of social capital contribution to economic growth, as well as, investment, human capital and institutional quality. The estimated coefficient of equation (2.1) showed positive and significant relationship of trust, human capital, institutional quality, and investment with economic growth respectively at 5% and 10% levels of significance.

Table 2.8 highlights the positive and significant connection between social capital measured by the trust index and different transmission channels. With regard to our finding, there is no doubt that the level of interpersonal trust within the community has an impact on each of economic growth determinants, and at the same time influences the processes through which citizens or groups operate, meet their obligations and exercise their legal rights.

Table 2.7. Gross domestic product equation estimates for group of countries with medium and low control of corruption

Independent variables	Estimated coefficients
Constant	0.803
	(0.39)
Y_0	-1.116***
	(-4.94)
Trust	0.493**
	(2.01)
IY	1.497*
	(1.94)
FD	0.174
	(0.47)
HK	0.824**
	(2.20)
IQ	0.009**
	(1.99)
Observations	38
R^2	0.63
F-Stat	9.07***

Notes: the dependent variable is the annual real GDP per capita growth rate.
Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

Table 2.8. Transmission channels equation estimates for group of countries with medium and low control of corruption

Independent variables	Dependent variables			
	HK	FD	IQ	IY
Constant	2.884***	2.501***	-39.408	2.672***
	(5.86)	(7.12)	(-1.46)	(17.33)
Trust	0.347**	0.383***	18.287**	0.145***
	(2.09)	(3.24)	(2.01)	(2.80)
Observations	38	38	38	38
R^2	0.10	0.22	0.10	0.17
F-Stat	4.37**	10.50***	4.06**	7.83***

Notes: Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

In what follows, we will examine the effect of interpersonal trust, and its transmission channels on economic growth for the group of developed and developing countries[36]. The Table 2.9 gives the statistical description of the set of variables used in the estimation of equations (2.1) and (2.2).

Table 2.9. Descriptive statistics by group of developed and developing countries

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
Developed countries						
G_Y	%	29	1.95	0.58	0.99	3.37
Y_0	US$	29	19632.79	5197.33	9093.91	29750.80
$Trust$	%	29	36.79	14.07	9.90	63.05
HK	%	29	100.42	13.70	75.18	148.46
IY	%	29	23.10	3.15	17.59	30.10
IQ	%	29	104.30	26.73	58.23	141.28
FD	%	27	77.52	41.87	31.70	218.94
Developing countries						
G_Y	%	56	2.51	2.12	-1.65	8.60
Y_0	US$	56	4286.61	3681.29	231.59	14304.29
$Trust$	%	56	21.69	11.42	4.90	54.85
HK	%	54	65.10	26.81	7.51	98.30
IY	%	53	23.57	5.46	13.81	40.07
IQ	%	56	9.08	33.98	-45.53	117.79
FD	%	49	38.58	20.59	11.98	108.49

Source: Author's calculation.

The output of the estimated equation (2.1), given in the table 2.10 summarizes the relations between economic growth, trust and each of the transmission channels for a group of developed countries. The estimation reveals that the social capital indicator is positively interrelated with economic growth at the 5% level of significance. The coefficients of the variables representing human capital, financial development and investment are positive; however, they are not statistically significant. Table 2.11 confirms the positive connection between interpersonal trust within the community and both institutional environment quality and human capital. Such finding corroborates with Douglas North [2005] who opined that the

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[36] See appendix A.2 for the list of countries.

structure of the society that defines people incentive is composed not only by formal regulations and rules, but also by informal characteristics like confidence and loyalty that constrain people choice and behavior.

Table 2.10. Gross domestic product equation estimates for group of developed countries

Independent variables	Estimated coefficients
Constant	13.211** (2.08)
Y_0	-1.811*** (-3.75)
Trust	0.924** (2.46)
IY	0.167 (0.17)
FD	0.163 (0.51)
HK	0.516 (0.54)
IQ	-0.004 (-0.69)
Observations	23
R^2	0.55
F-Stat	3.36***

Notes: the dependent variable is the annual real GDP per capita growth rate.
Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

Table 2.11. Transmission channels equation estimates for group of developed countries

Independent variables	Dependent variables			
	HK	FD	IQ	IY
Constant	4.056*** (13.80)	5.203*** (5.44)	-66.303 (-1.49)	3.318*** (11.77)
Trust	0.155* (1.94)	-0.239 (-0.92)	48.855*** (4.01)	-0.059 (-0.78)
Observations	23	23	23	23
R^2	0.15	0.03	0.43	0.02
F-Stat	3.78*	0.85	16.11***	0.60

Notes: Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

Among developing countries the positive influence of interpersonal trust on economic growth is still valid. The results in the table 2.12, shows that the estimated coefficient of trust index is positive and statistically significant at the 5% level of significance. Similarly, the coefficients of investment, human capital and institutional quality are positive and statistically significant at the 5% and 1% levels, respectively.

Table 2.12. Gross domestic product equation estimates for group of developing countries

Independent variables	Estimated coefficients
Constant	1.134 (0.57)
Y_0	-1.151*** (-4.61)
Trust	0.554** (2.17)
IY	1.537** (2.02)
FD	0.062 (0.16)
HK	0.833** (2.07)
IQ	0.013*** (2.62)
Observations	37
R^2	0.65
F-Stat	9.44***

Notes: the dependent variable is the annual real GDP per capita growth rate.
Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

It seems that good governance approach that "put together" formal and informal institution is important to the economic growth. Results in the Table 2.13 for a set of developing countries verify the positive relationship interpersonal trust or informal institution and formal institutional quality. Similarly, the estimated coefficients by the variable representing trust are positive and statistically significant in the regressions with investment, human capital and financial development as dependent variables.

Table 2.13. Transmission channels equation estimates for group of developing countries

Independent variables	Dependent variables			
	HK	**FD**	**IQ**	**IY**
Constant	3.037*** (5.85)	2.523*** (6.95)	-8.730 (-0.35)	2.630*** (15.67)
Trust	0.290** (1.63)	0.370*** (2.97)	6.828 (0.79)	0.159*** (2.77)
Observations	37	37	37	37
R^2	0.07	0.20	0.01	0.179
F-Stat	2.66*	8.85***	0.62	7.68***

Notes: Figures in parentheses represent values of calculated Student's t-statistics.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Source: Author's calculation.

2.5. Robustness analysis

To check the robustness of our results and the different empirical investigations on the trust and growth nexus, we use technique of *Extreme Bounds Analysis* (EBA), that was developed first by Leamer [1985] and used later by Levine and Renelt [1992] and Sala-I-Martin [1997]. The objective of this method is to carry out a series of regressions in order to test the sensitivity of the real GDP per capita growth rate, as a dependent variable, to small changes in the different specifications of the model with different combinations of the independent variables.

To test the robustness of our model specification with the EBA we estimate, as in Sala-I-Martin [1997], the following equation:

$$G = \alpha_0 + \alpha_j F + \beta_j C + \varepsilon_j, \tag{2.5}$$

Where: G is a vector of growth rates of the real GDP per capita, F a vector of fixed variables usually presents in the regressions, which are the initial income level Y_0 and social capital indicator $Trust$ as in Beugelsdijk et al. [2004]. C is a vector of conditioning variables and contains four variables: the investment ratio IY, schooling HK, financial development FD, and

institutional quality index IQ. Finally, α_j and β_j are the corresponding respective coefficients and the superscript j refers to the explanatory variables.

To carry out the robustness analysis, we run 2^m combination of regression where m is the number of switch variable (variables that change with the specification of the model). The principle of this methodology is to check the robustness of the relationship between the dependent variable and the explanatory variables for different specifications of the model. For example, if we have one dependent variable and five explanatory variables (A, B, C, D, E) with two of them fixed variables (A, B) and the three other are switch variables (C, D, E). The different specifications of the estimated model will be: (A, B), (A, B, C), (A. B, D), (A, B, E), (A, B, C, D), (A, B, C, E), (A, B, D, E) and (A, B, C, D, E). The total number of regression will be $2^3 = 8$.

In our case, we will perform 16 combinations of regressions (i.e. 2^4) in order to assess the robustness of the relationship between trust and economic growth, where we will use the variable initial GDP (Y_i) and $Trust$ variable as fixed variable and the investment ratio (IY), schooling (HK), financial development (FD), and institutional quality index (IQ) as switch variables. The different robustness analysis carried out in the Table 2.14 shows the result of performed tests. T_1 represents the strong sign test. This test indicates whether all the estimated coefficients are of equal sign. The second T_2 robustness test indicates whether all the estimated coefficients are significant and with the same sign. The third test reports the results of the weighted weak $EBA\ test$, which indicates whether this latter is passed after having been weighted with the log-likelihood. The fourth test reports the fraction of the cumulative density function (CDF) that is to the right of zero. For this latter criterion, we label a variable as robust if this fraction exceeds 95% or is less than 5% [37].

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[37] As in Beugelsdijk et al. [2004].

The results of the robustness analysis show that the level of $Trust$ is robustly associated with the real GDP per capita growth rate; it is statistically significant at the 99% confidence level. For this measure of social capital the strong sign test (T_1) and the other tests (T_2), and the weighted extreme bounds test (T_3) are passed. Similar results are also valid for the other determinants of economic growth such as the investment, institutional quality variables, human capital and financial development proxy (Table 2.14). The robustness analysis is also valid for the group of developed countries (Table 2.15) and the group of developing countries (Table 2.16). A similar result is found for the group of countries with the different levels of institutional quality (Tables 2.17 and 2.18).

The second dimension of robustness focuses on the effect of $Trust$ on the different transmission channels. In this case, we consider a subset of conditioning variables consisting of the following: the investment ratio IY, schooling HK, financial development FD, and institutional quality index IQ. To carry out the robustness analysis, we run 16 combinations of regressions (i.e. 2^4) in order to assess the robustness of the relationship between the transmission channels and $Trust$.

The different robustness tests in the Table 2.19 show that the *financial development* indicator is robustly correlated with $trust$; and statistically significant at the 99% confidence level. For the *institutional quality* and *human capital* we found that the strong sign test (T_1) is passed. This outcome underlines the importance of trust to improve the institutional quality and knowledge in these countries.

This result is also robust for the group of developed (Table 2.20) and developing countries (Table 2.21). The same finding is still valid for the group of countries with high control of corruption (Table 2.22) and group of countries with low and medium control of corruption (Table 2.23).

Table 2.14. Robustness results of gross domestic product growth equation.

Variables	Number of models	Mean	St. dev.	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	16	1.37	2.88	-1.70	4.44	0.69	0.38	0.06	0.00	0.00	0.00	0.81
Y_0	16	-0.83	0.27	-1.12	-0.54	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Trust	16	0.73	0.21	0.51	0.95	1.00	1.00	0.00	1.00	1.00	1.00	1.00
HK	8	0.97	0.13	0.79	1.16	1.00	0.75	0.00	1.00	0.00	1.00	1.00
IY	8	1.96	0.80	0.84	3.09	1.00	0.88	0.00	1.00	0.00	1.00	1.00
IQ	8	0.84	0.26	0.48	1.21	1.00	0.63	0.00	1.00	0.00	1.00	0.98
FD	8	0.76	0.18	0.51	1.01	1.00	0.75	0.00	1.00	0.00	1.00	0.99

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.15. Robustness results of gross domestic product equation for the group of developed countries

Variables	Number of models	Mean	St. dev.	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	16	16.50	1.60	14.80	18.20	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Y_0	16	-1.89	0.08	-1.98	-1.80	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Trust	16	0.78	0.05	0.72	0.84	1.00	1.00	0.00	1.00	1.00	1.00	0.99
HK	8	0.34	0.26	-0.02	0.70	0.88	0.00	0.00	0.00	0.00	0.00	0.66
IY	8	0.28	0.21	-0.02	0.58	0.75	0.00	0.00	0.00	0.00	0.00	0.63
IQ	8	-0.26	0.06	-0.34	-0.18	0.00	0.00	0.00	1.00	0.00	0.00	0.31
FD	8	0.23	0.05	0.15	0.30	1.00	0.00	0.00	1.00	0.00	0.00	0.80

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.16. Robustness results of gross domestic product equation for the group of developing countries

Variables	Number of models	Mean	St. dev.	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	16	0.96	2.37	-1.56	3.49	0.69	0.19	0.00	0.00	0.00	0.00	0.65
Y_0	16	-0.79	0.33	-1.14	-0.44	0.00	0.00	0.88	1.00	0.00	1.00	0.00
Trust	16	0.89	0.36	0.51	1.27	1.00	0.94	0.00	1.00	0.00	1.00	1.00
HK	8	0.79	0.32	0.34	1.24	1.00	0.25	0.00	1.00	0.00	1.00	0.95
IY	8	1.77	0.98	0.39	3.15	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IQ	8	1.54	0.40	0.99	2.10	1.00	0.88	0.00	1.00	0.00	1.00	1.00
FD	8	1.93	0.66	1.00	2.86	1.00	0.63	0.00	1.00	0.00	1.00	0.99

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.17. Robustness results of gross domestic product equation for the group of countries with high control of corruption

Variables	Number of models	Mean	St. dev.	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	16	8.23	3.11	4.91	11.50	1.00	0.50	0.00	1.00	0.00	1.00	0.98
Y_0	16	-1.07	0.17	-1.25	-0.90	0.00	0.00	0.81	1.00	0.00	1.00	0.01
Trust	16	0.30	0.41	-0.14	0.73	0.75	0.00	0.00	0.00	0.00	0.00	0.69
HK	8	0.02	0.32	-0.43	0.47	0.25	0.00	0.00	0.00	0.00	0.00	0.50
IY	8	1.93	0.62	1.06	2.81	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IQ	8	0.12	0.73	-0.91	1.14	0.50	0.00	0.00	0.00	0.00	0.00	0.61
FD	8	0.23	0.31	-0.21	0.66	0.75	0.00	0.00	0.00	0.00	0.00	0.75

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.18. Robustness results of gross domestic product equation for the gross domestic product of countries with medium and low control of corruption

Variables	Number of models	Mean	St. dev.	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	16	1.24	2.32	-1.23	3.71	0.75	0.25	0.00	0.00	0.00	0.00	0.72
Y_0	16	-0.82	0.26	-1.10	-0.54	0.00	0.00	1.00	1.00	1.00	1.00	0.00
Trust	16	0.86	0.32	0.52	1.20	1.00	0.94	0.00	1.00	0.00	1.00	1.00
HK	8	0.79	0.22	0.48	1.10	1.00	0.63	0.00	1.00	0.00	1.00	0.96
IY	8	1.79	0.94	0.48	3.11	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IQ	8	0.88	0.27	0.49	1.26	1.00	0.25	0.00	1.00	0.00	1.00	0.92
FD	8	1.83	0.39	1.28	2.37	1.00	0.75	0.00	1.00	0.00	1.00	0.99

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.19. Sensitivity of trust

Variables	Number of models	Mean	St.dev	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	15	1.40	0.96	0.36	2.45	0.93	0.47	0.00	0.00	0.00	1.00	0.97
HK	8	0.33	0.12	0.16	0.50	1.00	0.63	0.00	1.00	0.00	1.00	1.00
IY	8	0.47	0.21	0.18	0.77	1.00	0.38	0.00	1.00	0.00	1.00	0.94
IQ	8	0.47	0.06	0.39	0.55	1.00	1.00	0.00	1.00	1.00	1.00	1.00
FD	8	0.39	0.19	0.12	0.66	1.00	0.50	0.00	1.00	0.00	1.00	0.99

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.20. Sensitivity of trust for the group of developed countries

Variables	Number of models	Mean	St.dev	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	15	1.44	3.37	-2.24	5.11	0.73	0.40	0.00	0.00	0.00	0.00	0.76
HK	8	1.02	0.68	0.06	1.98	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IY	8	-0.64	0.43	-1.25	-0.03	0.00	0.00	0.25	1.00	0.00	1.00	0.06
IQ	8	1.02	0.08	0.91	1.12	1.00	1.00	0.00	1.00	1.00	1.00	1.00
FD	8	0.25	0.08	0.14	0.37	1.00	0.63	0.00	1.00	0.00	0.00	0.79

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.21. Sensitivity of trust for the group of developing countries

Variables	Number of models	Mean	St.dev	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	15	0.89	1.32	-0.55	2.33	0.60	0.47	0.00	0.00	0.00	1.00	0.87
HK	8	0.24	0.04	0.18	0.30	1.00	0.25	0.00	1.00	0.00	1.00	0.97
IY	8	0.88	0.14	0.68	1.07	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IQ	8	0.01	0.06	-0.07	0.08	0.63	0.00	0.00	0.00	0.00	0.00	0.52
FD	8	0.40	0.22	0.09	0.72	1.00	0.00	0.00	1.00	0.00	0.00	0.83

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.22. Sensitivity of trust for the group of countries with high control of corruption

Variables	Number of models	Mean	St.dev	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	15	1.11	3.62	-2.83	5.05	0.60	0.47	0.00	0.00	0.00	0.00	0.80
HK	8	1.15	0.62	0.27	2.02	1.00	0.50	0.00	1.00	0.00	1.00	0.99
IY	8	-0.70	0.28	-1.09	-0.30	0.00	0.00	0.13	1.00	0.00	1.00	0.08
IQ	8	1.09	0.07	1.00	1.19	1.00	1.00	0.00	1.00	1.00	1.00	1.00
FD	8	0.32	0.09	0.19	0.45	1.00	0.50	0.00	1.00	0.00	0.00	0.91

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

Table 2.23. Sensitivity of trust for the group of countries with medium and low control of corruption

Variables	Number of models	Mean	St.dev	Conf. int. left	Conf. int. right	Fraction of positive values	Fraction of significant positive values	Fraction of significant negative values	T_1	T_2	T_3	T_4
CONST	15	0.80	1.37	-0.69	2.30	0.60	0.47	0.00	0.00	0.00	0.00	0.85
HK	8	0.25	0.05	0.17	0.32	1.00	0.38	0.00	1.00	0.00	1.00	0.98
IY	8	0.91	0.18	0.66	1.16	1.00	0.75	0.00	1.00	0.00	1.00	0.99
IQ	8	0.28	0.09	0.16	0.41	1.00	0.13	0.00	1.00	0.00	0.00	0.90
FD	8	0.48	0.24	0.14	0.82	1.00	0.13	0.00	1.00	0.00	0.00	0.88

T_1: strong sign test (all equal sign) passed? (Yes = 1),

T_2: strong extreme bounds test (all significant and equal sign) passed?(Yes = 1),

T_3: weighted extreme bounds test (95% significant and equal sign) passed? (Yes = 1),

T_4: weighted cumulative density function (CDF).

Source: Author's calculation.

2.6. Concluding remarks

According to Coleman [1988], social capital as a multidimensional concept is not a single entity, but a variety of different entities, with two elements in common: they all consist of some aspects of the social structures that facilitate certain actions of actors within the structure. However, this concept was subject to different critics because of its ambiguous.

This chapter has addressed one issue of the empirical literature, relating to the transmission channels of social capital and economic growth. The regressions were carried out for a set of 85 countries and subset of group of countries with different levels of income and group of countries with different levels of institutional environment quality during the period 1980–2009, where social capital is measured by the level of trust. The main results of the chapter are as follows:

- Firstly, the level of trust as a measure of social capital and economic growth are significantly and positively related.

- Secondly, a high level of trust also has an indirect effect on economic activity through its effect on financial development, human capital, investment and institutional quality. This result is also found valid for the group of countries with different specifications in terms of quality of institution and differences in the levels of income.

- Thirdly, The results for the group of countries with different echelon of institutional environment quality and also different levels of income show that social capital indicator, measured by trust index still impact positively economic growth; nevertheless, differences are distinguished with the financial development variables, the sign of the estimated coefficient is contradictory between the sub group of countries, in some cases it is negatively linked to the annual growth rate of GDP per capita. Such unexpected result led us to try to explain in the following chapter why financial sector development has a negative impact on economic growth?

- Finally, the above results are found to be robust statistically with the extreme bound analysis (EBA). It corroborates the fact that an improvement of the social infrastructure with high levels of trust and cooperation between individuals has not only a direct but also an indirect effect on economic growth through the financial development in the economy.

Chapter III

Finance and long-run growth: the role of formal and informal institutions

3.1.   Introduction

The past decades have witnessed a resurgence of academic work on the effects of financial development on economic growth. However, the debate is not new since it can be traced back to Bagehot [1873] and Schumpeter [1912], who stressed the importance of the banking sector in providing the funds necessary for economic growth. The analysis of this theoretical consideration was later followed by several notable contributions, especially those from Gurley and Shaw [1955], Patrick [1966], and Goldsmith [1969], who offered a more consistent contribution to the debate by more accurately defining the role of financial intermediation in the economy.

This kind of analysis was extensively developed during the 1970s by McKinnon [1973] and Shaw [1973], both of whom stressed the positive effects of financial market liberalization and its influence on economic growth. Specifically, they asserted that government quantitative restrictions of the banking system restrain the volume and productivity of investments, and impede the process of economic growth. As a consequence, they recommended that the financial system should be liberalized to increase the volume and productivity of investments.

However, the failure of certain financial liberalization experiences raised the skepticism of economists as well as policymakers about the aptitude and efficiency of these financial liberalization policies. Indeed, in many countries, banking sectors experienced many

problems after the beginning of financial deregulation (Sheng [1995], Caprio and Klingebiel [1996]).

The most recent approaches highlight the importance of the development of the institutional environment in promoting financial system stability (La Porta et al. [1997, 1998], Barth et al. [2002], Acemoglu et al. [2002]). According to this literature, in countries with a less developed institutional environment financial reforms may exert adverse effects on the financial systems and economic growth. Another new factor that has been pinpointed by the recent literature, considered as the natural complement of the institutional environment, is the quality of social capital in individual countries.

This sociological concept has been adopted by political scientists (Putnam et al. [1993] and Fukuyama [1995]) and especially by development economics. In this latter field, it has become widely accepted that a higher level of cooperation and confidence between individuals within a country, considered as the main determinant of social capital, improves not only the capabilities of individual agents, but also the overall economic performance (Temple and Johnson [1998], Knack and Keefer [1997], Durlauf [2002], and Dasgupta [2005]).

An extensive amount of theoretical and empirical investigations has been conducted to confirm the importance of this sociological concept for the development of economic performance because it contributes to a reduction in transaction costs (Knack and Keefer [1997]). Moreover, social capital has a positive effect on the development of financial markets because it encourages individuals to have more access to credit, increases their participation in the stock market and reduces their reliance on informal sources of finance (Guiso, Sapienza and Zingales [2000]). Social capital may also encourage individuals to respect financial contracts with their partners (Caldéron, Chong and Galindo [2001], and Hong, Kubik and Stein [2001]).

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Despite the volume of empirical investigations on the effects of social capital on economic activity, few studies have focused on estimating the effects of social capital and institutional quality, *firstly*, on financial development and, *secondly*, on long-term economic growth. For this reason, we will try to find out if the effect of financial sector development on long-run growth depends on the formal institutional aspects measured by the institutional environment quality index and informal institutional aspects measured by the level of social capital in society. In other words, we will examine if the quality of formal institutions as well as the level of confidence and cooperation between individuals are important to promoting the financial sector and consequently, long-run economic growth.

The aim of the chapter is to investigate empirically the hypothesis that the formal and informal institutional framework, measured by the level of institutional quality and the level of social capital, can impact on financial development and long-run economic growth for a sample of 85 selected countries and across sub group with different levels of income and institutional quality[38] for the period spanning from 1980 to 2009 using a dynamic panel system GMM method.

3.2. Theoretical and empirical debate

A large body of literature has emerged, at both the theoretical and empirical levels, attempting to explain the relationship between financial development and economic growth. The debate shows that financial development (repression[39]) has a positive (respectively, negative[40]) effect on economic growth through its impact on factor accumulation. An efficient financial system

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[38] See appendix A.

[39] Financial repression defines a measure of financial control taken by the government, like limitations imposed on interest rates and regulation on capital movement between countries. This concept was introduced by Edward S. Shaw [1973] and Ronald I. McKinnon[1973].

[40] The financial repression regulation can limit financial resources available for financial intermediary that may generate a negative impact on economic activities.

allocates funds to investment activities that yield the highest return (Greenwood and Jovanovic [1990]).

Bencivenga and Smith [1991] argued that the development of financial intermediation can eliminate liquidity risks and liquidity provision. In the same context, Saint-Paul [1992] proposes that the development of financial market activities can allow individuals to choose more productive technology and diversify their investment portfolio to insure themselves against risks. Other researchers have argued that the effectiveness of financial intermediation in promoting economic growth depends on the quality of institutions.

La Porta et al. [1997, 1998, and 1999] found that the legal system plays a crucial role in promoting the development of financial institutions and economic growth. They argued that weak contract enforcement creates incentives for default by debtors and increases the insolvency of the banking sector. Likewise, a higher level of corruption or political interference can divert credit to unproductive activities. In this context, the development of the institutional environment can improve the effectiveness of financial systems and promote economic growth. Another new factor that has been pinpointed by recent research reports, considered as the natural complement of the institutional environment, is the quality of social capital in individual countries.

The past decade has seen many investigations of the concept of social capital and its relationship to economic performance. One of the pioneers in the field, Putnam [1995], suggested that social capital refers to features of social trust that facilitates network between individuals and enables them to act and cooperate more effectively to meet their target.

An extensive amount of empirical investigations has been conducted to test the importance of social capital for the development of economic performance and the development of the financial market. In a unique study, Knack and Keefer [1997] found that lower trust can discourage innovation because entrepreneurs must devote more time to

monitoring possible malfeasance by partners, employees and suppliers, while spending less time on innovation for new products or processes.

Therefore, an individual in a society with a high levels of trust and civic cooperation standards spends less time protecting themselves from being exploited in economic transactions and devotes less time to diverting resources with a view to protecting them. In this case, the costs of monitoring and enforcing contracts are likely to be lower, raising the payoffs to many investments and other economic transactions.

La Porta et al. [1997] found that the revenues of the 20 biggest firms as a percentage of GDP per capita are also positively correlated with the level of trust in people. Zak and Knack [2001] added other countries to the first sample used by Knack and Keefer [1997] and found that trust is higher in countries with more effective and functioning institutions (Bartlett et al. [2013]).

Moreover, in a recent and original study, Guizo, Sapienza and Zingales [2000] examined the relationship between financial development and social capital. Their basic intuition is that "*One of the mechanisms through which social capital impacts economic efficiency is by enhancing the prevailing level of trust. Since financial contracts are the ultimate trust-intensive contracts, social capital should have major effects on the development of financial markets*".

3.3.   Empirical investigation

Our objective is to investigate empirically the effect of formal institutional quality and social capital on financial development and long-term economic growth for a sample of 85 developed and developing countries. We use data for the countries spanning from 1980 to 2009 using dynamic panel system GMM estimators that contain both first-differenced and

levels equations as developed by Arellano and Bond [1991], Blundell and Bond [1998, 2000], and Arellano [2003][41].

In an early contribution Levine (1997) tried to investigate the effect of financial development in explaining variations in cross-country growth rates. Borrowing Levine's idea and using the same explanatory variables, we will investigate the relationship between financial system development and economic growth. The stylized form of the equation can be expressed as follows:

$$Y_t^i - Y_{t-1}^i = \alpha Y_0^i + \beta' X_t^i + \gamma LLY_t^i \times Trust_t^i + \mu_i + \varepsilon_t^i, \tag{3.1}$$

where: Y_t^i is the logarithm of the annual real GDP per capita in country i in year t, Y_0^i − the initial real GDP per capita, X_t^i − a set of explanatory variables, including an investment indicator measured by the ratio of gross capital formation to GDP, INV_t^i, the population growth rate, POP_t^i, and the financial development indicator measured by the ratio of broad money to GDP, LLY_t^i. The social capital indicator in our model is measured by the trust index, $Trust_t^i$, calculated based on 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?"*. The model includes an interaction term between $Trust$ and the financial development indicator[42]. In fact the introduction of an interaction effect in the equation will allow us to analyze the effect of financial development conditioned by other variables. The usual interpretation of the estimated parameter is that it represents the effect of financial development on economic growth dependent on the level of another independent variable. The term μ_i captures unobserved country-specific effects, and ε_t^i is an error term. The sources of the variables used in the model are the Penn World Table [2011] (PWT), Thorsten Beck's financial development

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[41] For more details see appendix C.2.
[42] Social capital measured by the level of trust is computed as the percentage of individuals who trust other people and is extracted from the *World Value Survey* (WVS). For more details please see chapter 2 page 52.

database [2010], Kaufman, Kraay and Zoido-Lebaton's institutional environment quality index, and the World Value Survey database (WVS). Table 3.1 summarizes the descriptive statistics of variables used in the model.

Table 3.1. Descriptive statistics

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
G_Y	%	2426	2.35	5.72	-45.60	66.10
Y_0	US$	2426	10241.70	8623.91	231.59	29750.80
Trust	%	1550	28.76	14.89	3.80	68.00
IY	%	2329	23.34	7.07	0.10	72.40
Pop	%	2600	1.13	1.27	-7.53	11.18
LLY	%	1988	57.85	45.44	4.63	478.10
IQ	%	2656	42.55	67.67	-160.52	198.33

Note: G_Y is the growth rate of the annual real GDP per capita, it is equal to $= ln(Y_t) - ln(Y_{t-1})$
Source: Author's calculation.

The different regressions of equation (3.1) using the dynamic panel GMM system method, carried out in the Table 3.2 reveal a negative and significant effect of financial development on economic growth.

Such a result is not new in the empirical literature, especially when it comes to developing countries (De Gregorio and Guidotti, [1995]; Bethélemy and Varoudakiss, [1995], and Boulila and Trabelsi, [2004]), and could be due to instability and massive government intervention in these countries' financial systems.

The Table 3.2 carries out the results of the estimation of equation (3.1). The result of the regression shows that there is positive interaction effect between financial development and social capital ($Trust$), as the estimated coefficient is positive and significant at the 1% level of significance. This result shows that financial development can have a significant effect on economic growth only through a high level of confidence between individuals in a society. In other words, the positive effect of financial development on economic growth in

the long run is determined by the presence of a healthy social climate with a high levels of trust and cooperation among economic agents.

Table 3.2. Financial development, trust and gross domestic product growth in developed and developing countries

Independent variables	Estimated coefficients
Constant	-9.789*** (-2.93)
Y_0	-0.937*** (-3.02)
INVY	4.954*** (6.07)
POP	-0.269 (-1.34)
LLY	-2.601*** (-3.89)
Trust* LLY	1.554*** (2.77)
Observations	1138
F- statistics	13.72***
Difference Sargan test[43]	0.30

Notes: the dependent variable is the annual real GDP per capita growth rate.
* and*** represent 10% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

The F-statistics in the Table 3.2 shows that the overall regression is statistically significant at the 1% level of significance. The difference Sargan test shows that the lagged differences of the explanatory variables used as the instrument in the model, are not correlated with the error term, so the instrumental variables in the estimations were chosen correctly.

Similarly, we tried to test empirically the relationship between the quality of formal institutions, financial development and economic growth in the long run. Using the same structure of equation (3.1), in equation (3.2) we introduced the interaction between the financial development indicator and the quality of institution index. The stylized form of the equation is represented by:

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[43]The difference Sargan test examines the null hypothesis that the lagged differences of the explanatory variables are uncorrelated with the errors in the levels equations.

$$Y_t^i - Y_{t-1}^i = \alpha Y_0^i + \beta' X_t^i + \gamma LLY_t^i \times IQ_t^i + \mu_i + \varepsilon_t^i \tag{3.2}$$

where: IQ refers to the general institutional environment quality index, a composite measure of a set of institutional environment indicators including voice and accountability, political stability and absence of violence, government effectiveness, and regulatory quality, rule of law and control of corruption. A high value of the general institutional environment quality index IQ reflects an improvement in the quality of the institutional environment and better governance in the economy.

The estimated results from equation (3.2) are presented in the Table 3.3 which confirms the positive effects of institutional quality (measured by the IQ index) on financial development and long-term economic growth. The overall regression F-statistic is significant at 1% level of significance. In sum, the above results show a coherent set of findings: improved formal and informal institutional quality leads to greater financial system development and long-term economic growth for a sample of developed and developing countries.

Table 3.3. Financial development, institutional environment quality and gross domestic product growth in developed and developing countries

Independent variables	Estimated coefficients
Constant	-10.951*** (-3.30)
Y_0	-0.535* (-1.76)
INVY	5.938*** (8.07)
POP	-0.629*** (-3.94)
LLY	-1.620*** (-4.29)
IQ*LLY	0.790*** (2.91)
Observations	1344
F-statistics	16.31***
Difference Sargan test	0.19

Notes: the dependent variable is the annual real GDP per capita growth rate.
* and*** represent 10% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

These findings are consistent with the view that a healthy social environment with a high levels of trust and cooperation among individuals helps develop a sustainable financial system where individuals respect the rules, share information and honor their financial commitments. On the other hand, a good institutional environment with a high level of control and better regulation encourages people to behave in the right way and respect rules of law and influences their decision on whether or not to engage in corrupt activities. Corruption behavior is likely to be particularly low or absent in a society where institutional regulation and government control are highly valued. As it can be also seen, all the other macroeconomic control variables in the regressions are with the expected signs except for the population growth rate, whose coefficient in the regression explaining economic growth is negative and significant. Such result is not new in the literature; Kling and Pritchett [1994] suggested that income *per capita* may change due to rapid population growth basically because of change in the age structure of the population, as dependency rates vary substantially across countries with different demographic patterns.

To analyze in depth the complementarities between institutional quality and social capital, we will attempt to examine the relationship between institution, trust, financial development and long-term economic growth for two sets of countries: one group consisting of countries with a strong institutional environment and another group with a weak institutional environment.

The approach uses the World Bank indicator of governance, measured by corruption control index defined by the level of corruption or bribery that exists among people that operate in public or private sectors. A high percentile rank indicates a strong institutional environment in a country, while a low percentile rank shows that a country has a weak institutional environment[44].

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[44] We used the same classification as in chapter 2.

Table 3.4 describes the statistics of the explanatory variables introduced in the model for each group of countries.

Table 3.4. Descriptive statistics by group of countries with different levels of institutional quality

Variables	Unit	Observations[45]	Mean	Std. Dev.	Min	Max
Group of countries with high control of corruption						
G_Y	%	846	2.23	3.45	-19.49	13.06
Y_0	US\$	809	18783.09	6372.09	5120.62	29750.80
$Trust$	%	589	39.18	14.25	9.90	68.00
IY	%	827	22.79	5.01	9.80	46.95
Pop	%	868	0.72	0.75	-2.57	5.32
LLY	%	726	84.30	58.88	19.31	478.10
IQ	%	854	109.54	40.84	0	198.33
Group of countries with medium and low control of corruption						
G_Y	%	1580	2.41	6.63	-45.60	66.10
Y_0	US\$	1291	4889.28	4599.71	231.59	1923.43
$Trust$	%	961	22.37	11.22	3.80	57.20
IY	%	1502	23.64	7.97	0.10	72.40
Pop	%	1732	1.33	1.42	-7.53	11.18
LLY	%	1262	42.63	25.02	4.63	132.94
IQ	%	1802	10.81	53.15	-160.52	105.78

Note: G_Y is the growth rate of the annual real GDP per capita, it is equal to $= ln(Y_t) - ln(Y_{t-1})$.
Source: Author's calculation.

In columns numbered 1 and 2 of the Table 3.5, we used an interaction between financial development indicator and social capital measured by the "trust index" for the group of countries with high control of corruption and medium and low control of corruption. The results of the regression (3.1) show that the coefficient of the interaction is positive for the group of countries with a strong institutional environment; however, it is negative for the group of countries with a weak institutional system.

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[45] It is the number of observation across countries and time period.

Table 3.5. Financial development, trust by group of countries

Independent variables	Group of countries with high control of corruption	Group of countries with medium & low control of corruption
Constant	6.803** (1.89)	-3.083 (-0.74)
Y_0	-1.748*** (-4.91)	-1.305*** (-4.64)
INVY	3.512*** (5.25)	5.846*** (6.16)
POP	-0.286* (-1.74)	-0.680*** (-2.67)
LLY	-1.185*** (-3.67)	-0.388 (-0.41)
Trust* LLY	0.454 (1.38)	-0.398 (-0.59)
Observations	520	618
F-statistics	16.06***	15.36***
Difference Sargan test	4.92**	0.04

Notes: the dependent variable is the annual real GDP per capita growth rate.
 *, ** and*** represent 10%, 5% and 1% significance levels respectively.
 Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

This result supports the view that countries with strong institutions build mutual trust between individuals and the regulatory authorities, promote transparency, and positively influence the development of the financial system and long-term economic growth. Similarly, the convergence hypothesis is respected in the model. The coefficient of the initial real GDP per capita is negative and significant at 1% level of significance, which is consistent with the work of Mankiw, Romer and Weil [1992]. Investment remains a robust engine of long-term economic growth, as the results in Table 3.5 show that the coefficient of investment is positive and significant at 1% level of significance for the two groups of countries and the financial development indicator measured by the ratio of liquid liabilities to GDP. Table 3.6 contains the result of the regression (3.2) with the interaction between financial development variable, LLY, and the quality of the institutional environment variable, IQ. The regression was performed for two different groups of countries divided according to the level of

corruption. The results of the estimated equation (3.2) confirm the importance of good institutional quality to the development of the financial system and long-term economic growth. The estimated coefficient of the interaction term between financial development and institutional quality is positive and significant at 1% level of significance for the group of countries with high control of corruption, but negative and insignificant, for the group of countries with medium and low control of corruption. This leads us to conclude that the social capital and institutional quality exert a more robust influence on financial development and long-term economic growth in countries with high control of corruption than in countries with medium and low control of corruption. Such conclusion is in line with North's [1990] statement that "*people life tends to be ordered by formal rules, when in fact actions are guided more by informal constraints such as norms of behavior and conventions*". Therefore, in countries with strong institutions the impact of social capital on economic activity tends to be higher than in countries with weak institutions.

Table 3.6. Financial development, institutional environment by group of countries

Independent variables	Group of countries with high control of corruption	Group of countries with medium & low control of corruption
Constant	-2.256 (-0.66)	-3.221 (-0.76)
Y_0	-1.167*** (-3.81)	-0.685** (-1.97)
INVY	5.027*** (8.34)	3.884*** (4.54)
POP	-0.080 (-0.55)	-0.901*** (-4.12)
LLY	-1.708*** (-4.25)	-0.268 (-0.58)
IQ*LLY	0.972*** (3.08)	-0.008 (-0.03)
Observations	698	646
F-statistics	20.84***	10.21***
Difference Sargan test	0.75	1.88

Notes: the dependent variable is the annual real GDP per capita growth rate.
 *, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

In what follows, we shall examine the validity of the positive relationship between trust, institutional quality, financial development and long-term economic growth based on the classification of countries into developed and developing economies. The description statistics of the variables used to estimate equations (3.1) and (3.2) are summarized in the Table 3.7.

Table 3.7. Descriptive statistics by group of developed and developing countries

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
Developed countries						
G_Y	%	859	2.06	3.26	-19.49	13.39
Y_0	US\$	780	19933.97	5218.92	9093.91	29750.80
$Trust$	%	610	39.35	13.59	9.90	68.00
IY	%	832	22.79	4.28	13.47	39.64
Pop	%	900	0.59	0.61	-2.57	4.43
LLY	%	727	85.01	57.86	19.31	478.10
IQ	%	886	105.75	41.42	0.00	198.33
Developing countries						
G_Y	%	1567	2.50	6.70	-45.60	66.10
Y_0	US\$	1320	4514.45	3726.60	231.59	14304.29
$Trust$	%	940	21.88	11.21	3.80	56.30
IY	%	1497	23.64	8.21	0.10	72.40
Pop	%	1700	1.41	1.43	-7.53	11.18
LLY	%	1261	42.19	25.62	4.63	132.94
IQ	%	1770	10.92	54.90	-160.52	153.10

Note: G_Y is the growth rate of the annual real GDP per capita, it is equal to $= ln(Y_t) - ln(Y_{t-1})$
Source: Author's calculation

The results shown in the Table 3.8, allow us to analyze the importance of informal institutions, measured by trust index, in financial system development and long-term economic growth for the two sets of countries[46]. The output of the estimated equation (3.1), presented in the Table 3.8 shows that in the group of developed countries, the estimated coefficient of the interaction between $Trust$ index and financial development indicator is positive and statistically significant at 1% level of significance. However, in the group of

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[46] We used the same classification as in chapter 2.

developing countries it is negative and statistically insignificant. This result is not surprising as the institutional framework is fragile and weak in developing countries.

Table 3.8. Financial development, trust by group of developed and developing countries

Independent variables	Group of developed countries	Group of developing countries
Constant	8.390* (1.92)	-2.051 (-0.48)
Y_0	-2.529*** (-5.95)	-1.440*** (-4.43)
INVY	4.656*** (8.33)	5.721*** (5.98)
POP	-0.838*** (-4.79)	-0.425* (-1.77)
LLY	-1.930*** (-6.57)	-0.347 (-0.37)
Trust* LLY	1.252*** (4.37)	-0.276 (-0.39)
Observations	520	618
F-statistics	25.20***	13.44***
Difference Sargan test	35.63***	1.40

Notes: the dependent variable is the annual real GDP per capita growth rate.
 *, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

In Table 3.9 we tested the relationship between formal institutions, measured by the institutional quality index, and the development of financial system and long-term economic growth. The output of regression (3.2) in the Table 3.9 shows that in the group of developed countries, the coefficient of the interaction between financial development and the quality of institutional environment as an explanatory variable is positive and statistically significant at 1% level of significance. However, in the group of developing countries it is positive and insignificant. Given this result, we can realize that developing countries still lack of proper formal and informal institutional structure or what we call a lack of "good governance" that can be benefited for economic activity compared to developed countries.

Table 3.9. Financial development, institutional environment by group of developed and developing countries

Independent variables	Group of developed countries	Group of developing countries
Constant	-13.635*** (-3.40)	-12.080*** (-2.93)
Y_0	-0.099 (-0.30)	0.044 (0.11)
INVY	5.400*** (9.71)	4.550*** (4.92)
POP	-0.720*** (-4.46)	-0.462** (-2.29)
LLY	-2.041*** (-6.69)	-0.746 (-1.50)
IQ*LLY	1.482*** (6.16)	0.111 (0.36)
Observations	667	677
F-statistics	23.08***	9.20***
Difference Sargan test	0.30	2.18

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

3.4. Robustness analysis

To test the robustness of our results, which address the relationship between social capital, financial development and economic growth in the long run, we estimated the following model:

$$Y_t^i - Y_{t-1}^i = \gamma Y_0^i + \tau' V_t^i + \omega LLY_t^i \times Trust_t^i + \gamma_i + \varepsilon_t^i, \tag{3.3}$$

where: Y_t^i is the logarithm of the annual real GDP per capita in country i in year t, $V_t^i -$ financial development indicator measured by the liquid liabilities to GDP LLY_t^i. In the estimated model, we will check the impact of the interaction between financial development

and social capital indicator, measured by the trust index $Trust_t^i$, on economic growth. ε_t^i is an error term and γ_i captures unobserved country-specific effects.

The Table 3.10 contains different results of estimated equation (3.3), the estimated coefficient of the interaction between $Trust$ and the financial development indicator shows that the presence of a healthy social climate with a high levels of trust and cooperation among economic agents has a positive influence on financial system development and long-term economic growth (Bousrih [2012]). Similarly, we see that the convergence hypothesis is respected in the model. In other words, countries that initially have low per capita income tend to grow faster than high-income countries. This result is justified by the negative correlation between the real GDP per capita growth rate and the initial real GDP per capita, and is consistent with the work of Mankiw, Romer and Weil [1992].

Table 3.10. Trust and financial development

Independent variables	Estimated coefficients
Constant	4.984* (2.40)
Y_0	-1.067*** (-3.38)
LLY	-2.797*** (-4.10)
Trust* LLY	2.037*** (3.63)
Observations	1141
F-statistics	9.85***
Difference Sargan test	0.05

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

Similarly, and using the same structure of equation (3.3), we will examine the robustness of the relationship between formal institution, financial development and long-term economic growth. The estimated equation using the interaction effect of the general

institutional environment quality index IQ_t^i on the financial development indicator is represented as follows:

$$Y_t^i - Y_{t-1}^i = \gamma Y_0^i + \tau' V_t^i + \omega LLY_t^i \times IQ_t^i + \gamma_i + \varepsilon_t^i, \qquad (3.4)$$

The estimated coefficient result of equation (3.4) in the Table 3.11 reveals that there is a positive association between the quality of the institutional environment, financial development and economic growth. Indeed, the coefficient of the interaction term between financial development and the IQ index is positive. Therefore, developing the quality of formal institutions appears to be important to financial system development and economic growth in the long run.

Table 3.11. Institutional environment and financial development

Independent variables	Estimated coefficients
Constant	-2.718 (-1.09)
Y_0	0.495** (1.92)
LLY	-0.644* (-1.77)
IQ*LLY	0.256 (0.98)
Observations	1351
F-statistics	3.19**
Difference Sargan test	1.91

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

The importance of formal and informal institution quality to the development of the financial system is still valid for the two groups of countries with the different levels of institutional quality. The output of the estimated equation (3.3) in the Table 3.12 indicates that the coefficient of the interaction between the liquid liabilities to GDP and trust index, as a

proxy of social capital, is positive for both groups of countries, and it is significant at the 10%

level of significance for countries with medium and low control of corruption.

Table 3.12. Trust and financial development by group of countries

Independent variables	Group of countries with high control of corruption	Group of countries with medium & low control of corruption
Constant	17.890*** (5.89)	10.051*** (4.48)
Y_0	-1.736*** (-4.68)	-1.307*** (-5.46)
LLY	-0.762** (-2.36)	-1.544* (-1.69)
Trust* LLY	0.306 (0.91)	1.122* (1.81)
Observations	520	621
F-statistics	16.14***	10.05***
Difference Sargan test	4.50**	0.17

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
Figures in parentheses are absolute values of Student's t-statistics.
Source: Author's calculation.

The positive relationship between formal institutional quality, financial development

and long-term economic growth is also robust for both groups of countries with the different

levels of institutional quality. The result in the Table 3.13 shows that the positive effect of

financial development on long-term economic growth is conditioned by the presence of good

institutional quality in the country.

Table 3.13. Institutional environment and financial development by group of countries

Independent variables	Group of countries with high control of corruption	Group of countries with medium & low control of corruption
Constant	13.482*** (4.30)	-2.77 (-1.16)
Y_0	-1.174*** (-3.69)	0.563** (2.12)
LLY	-0.841** (-2.08)	0.098 (0.22)
IQ*LLY	0.638** (1.97)	0.040 (0.14)
Observations	699	652
F-statistics	5.99***	2.17*
Difference Sargan test	0.93	4.16**

Notes: the dependent variable is the annual real GDP per capita growth rate.

*, ** and*** represent 10%, 5% and 1% significance levels respectively.

 Figures in parentheses are absolute values of Student's t-statistics.

 Source: Author's calculation.

The Tables 3.14 and 3.15 contain the result of the robustness analysis of the relationship between financial development, informal and formal institutional framework and long-term economic growth for a set of developed and developing countries

The estimated coefficients of equation (3.3) in the Table 3.14 indicate that the result of the influence of interpersonal trust index over the economic growth is robust. For both groups of countries (developed and developing countries), the coefficient of the interaction between the financial development indicator and the interpersonal trust index is positive and significantly correlated with economic growth respectively at the 1% and 5% levels of significance.

Improving the quality of the institutional framework is also important to the development of the financial system and economic growth in the long term. The output of estimated equation (3.4) in the Table 3.15 confirms the positive relationship between formal institutional quality, financial development and long-term economic growth for both groups of countries.

Table 3.14. Trust and financial development by group of developed and developing countries

Independent variables	Group of developed countries	Group of developing countries
Constant	25.730*** (6.25)	12.147*** (4.58)
Y_0	-2.774*** (-6.18)	-1.613*** (-5.15)
LLY	-1.334*** (-4.39)	-1.670* (-1.81)
Trust* LLY	0.970*** (3.19)	1.325** (2.04)
Observations	520	621
F-statistics	15.86***	8.86***
Difference Sargan test	12.63***	1.29

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
 Figures in parentheses are absolute values of Student's t-statistics.
 Source: Author's calculation.

Table 3.15. Institutional environment and financial development by group of developed and developing countries

Independent variables	Group of developed countries	Group of developing countries
Constant	9.170*** (2.63)	-7.707*** (-2.63)
Y_0	-0.749*** (-2.13)	1.171*** (3.56)
LLY	-1.158*** (-3.73)	-0.137 (-0.29)
IQ*LLY	0.973*** (3.91)	0.085 (0.28)
Observations	667	684
F-statistics	5.74***	5.48***
Difference Sargan test	0.67	4.09**

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, ** and*** represent 10%, 5% and 1% significance levels respectively.
 Figures in parentheses are absolute values of Student's t-statistics.
 Source: Author's calculation.

3.5. Concluding remarks

In this chapter, we tried to show the importance of informal institutions, measured by the indicator of social capital, and formal institutions, measured by the index of Kaufman and Kraay, to financial development and long-term economic growth for a sample of 85 countries and subset group of countries with different levels of income and different levels of institutional environmental quality during the period of 1980-2009.

The output of the regression reveals two main results: *first*, the positive impact of financial development on long-term economic is conditioned by the presence of good interpersonal trust and high level of social capital in the country. *Second*, there is a close positive relationship between the quality of formal institutions, financial development and long-term economic growth.

However, results show contradictory findings concerning the importance of formal and informal institutions to the development of the financial sector and long-term economic growth between the subgroups of countries. In fact, it appears that for the groups of developing countries and medium to low formal institutional environment quality, the influence of the levels of social capital and formal institutional quality on financial development is negligible compared with the groups of developed countries and high formal institutional environment quality. Such finding confirms our view that in most developing countries where the institutional environment quality is weak and there is lack of confidence, people tend to involve in illegal activities that can be harmful to the financial activities in the country and economic situation and prospect later.

The robustness analysis of this model confirms the strong influence of formal and informal institutions on financial development and long-term economic growth. The improvement in the quality of formal institutions such as rules and laws and in the quality of informal institutions such as the levels of trust and cooperation among individuals in society

also play an important role in strengthening the financial sector in the country and reduce the risk exposure to the fragility of banking institutions. Understanding the root causes of fragility of financial sector, we will try in chapter four to explain how formal and informal institutions role is seen to be crucial for the success of financial sector development strategies and overcoming the probability of banking crisis.

Chapter IV

Financial liberalization, financial development and banking crisis: the role of social capital

4.1. Introduction:

Development experiences in developing countries during the 1960s and 1970s led to different results in terms of economic growth. In most of these countries, development strategies were characterized by a broad public intervention that gave the state extensive powers in the allocation of resources to investment considered socially optimum. Indeed, this strategy reduced the role of the private sector and the market adjustment in terms of resource allocation. In this context, policy makers in many countries took control of the financial system, composed mostly of commercial banks, imposed ceilings on interest rates and channeled funds to sectors considered strategic.

However, the 1980s experienced a turnaround for those countries with a tightening of economic and financial systems where domestic capitals were unable to provide sufficient resources for investment. These conditions led the governments to undertake financial reforms in order to efficiently mobilize financial resources and reduce reliance on external debt. However, the failure of some financial liberalization experiences (especially in some Latin American countries) raised skepticism among both economists and policy-makers, about the suitability and effectiveness of the financial liberalization policies and its capacity to lead to efficient development of the banking system. In many countries, the banking sector faced a number of problems after financial deregulation (Sheng, [1995]; Caprio and Klingebiel, [1996]; Kindleberger et al. [2011]), which triggered real economic crises

(Lindgren, Garcia and Saal, [1996]). Indeed, many questions on the effectiveness of these financial reforms policies pushed some economists to suggest more moderate financial system reforms (Caprio and Summers, [1994], Hellmann and Stiglitz [1994], Stiglitz [1994]).

The theoretical paradigm on the relationship between financial liberalization, financial development and economic growth has been mainly impregnated by the work of McKinnon [1988], Bencivenga and Smith [1991], Roubini and Sala-I-Martin [1992, 1995], Levine [1997], King and Levine [1993], De Gregorio and Guidotti [1995].

However the relationship between financial liberalization and financial fragility has not been studied adequately in the literature. The theoretical background to the field insists on the fact that financial liberalization promotes investment opportunities with higher risk, sometimes beyond what is socially desirable. In fact, the lack of regulation and prudential supervision of banks during financial deregulation may increase the risk of bank fragility (Chari and Jagannanthan, [1988], Kaminsky and Reinhart, [1996]). Other literatures emphasize other factors that are likely to increase the likelihood of banking crises after financial reforms, such as the quality of the institutional environment (regulatory standards, law enforcement, property rights, transparency and monitoring) (La Porta et al. [1997, 1998]; Levine, [1998]; Wurgler, [2000], Barth et al. [2002]; Acemuglu et al. [2002], and Edison, [2003]). In fact, financial reforms in countries with less-developed institutional environment may have adverse effects on the financial system with systemic banking crises in some cases. Another factor was also emphasized by the new literature and explored throughout the previous chapters of the thesis, refers to the concept of "social capital".

The aim of this chapter is to study *first* the test the hypothesis that financial liberalization may lead to banking crises and *second* to see if the probability of banking crises depends on factors other than those related to market conditions: i.e. the quality of the environment institution or the degree of trust between different actors in the economy. The

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idea is to show that in presence of strong formal and informal institutional platform within the society, market distortion can be avoided in a process of liberalization and regulation, competition and stability can co-exist in the financial sector and lead to the development of financial sector. For this reason, we chose a sample of 33 developed and developing countries[47] with the different levels of institutional development using Kaufman and Kraay index [2010]. The measure of social capital is calculated based on the percentage of responses to the following question "*Most people inspire confidence or not*" provided by the *World Values Survey* database (WVS)[48]. First, we used first a multivariate logit model for the period from 1980 to 2009 to test whether financial reforms increase the probability of banking crises. Then we applied regression model based on panel data to study: *first* the effects of social capital on financial development and economic growth and *second* the importance of institutional environment quality to boost the financial sector in the economy.

The rest of the chapter is organized as follows: the second section presents the literature contributions related to the topic, the third shows the empirical model, while the fourth part describes the different variables and data sources. The interpretations and discussions of the empirical results are provided in the fifth section. Finally, we conclude the chapter in the sixth part.

4.2. Literature overview

4.2.1. Banking crisis literature:

By definition, banking crisis is a situation where the banking system is insolvent. Demirguc-Kunt and Detragiache [1997, 1998] identify a situation of crisis if:

- the ratio of debt in relation to total assets of the banking system is higher than 10%,

- the cost of restructuring the banking system is at least equal to 2% of GDP,

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[47] The list is in page 125.
[48] We used the same measure of social capital in the entire document.

- government undertakes a large-scale nationalization of banks,

- there is a large number of bank bankruptcy and the implementation of a set of emergency policies undertaken by the monetary authorities.

In fact, the first generation of models on banking crises dates back to Mishkin [1978] and Diamond and Dybvig [1983] where crises were presented as bank liquidity risk on a deposit account. The second generation of models can be traced back to the work of Gavin and Hausmann [1996] and Kiyotaki and Moore [1997] well known as "credit cycle" models. Literatures in the field offer a wide range of explanations. Some discuss reasons that are likely to make banking system more vulnerable after the financial reforms and emphasis on the phenomenon of bank fragility risks that could be taken by banking intermediaries during periods of reforms. In the absence of ex-post public control of bank operations by prudential regulation and supervision of lending activities, this may increase bank insolvency and then the likelihood of banking crises. Moreover, the insurance offered by the monetary authorities to the banking system can encourage them to take more risks and amplify the problem of moral hazard (Caprio and Summers [1994]).

The recent approach highlights the role of institutional factors (regulations, law enforcement, property rights, transparency and monitoring standards) in the financial development and economic performance. La Porta et al. [1997, 1998] for example, found that their institutional index constructed on the basis of property rights and protection of income is significantly correlated with the size of the market. Levine [1998] highlighted significant correlation between institutional variables such as legal origin, the application of law and property rights and financial development and economic performance. In addition, Wurgler [2000] suggest that countries with high property right tend to have more developed financial systems with more efficient credit allocation in comparison to countries where the regulatory

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framework is less developed. Barth et al. [2002], based on a study on banking systems in 107 countries, concluded that "*the practices of regulation and supervision:*

- *widespread the accuracy of practices for the financial system,*

- *strengthen control over private banks and,*

- *encourage private agents to exert control that improves performance and stability of banks*".

Despite the wider empirical investigations on the different aspects of institutional environment and its importance to strengthen the financial system, the role of trust or social capital, considered in some cases as a complement in the development of institutional environment and financial markets, has been hardly explored.

4.2.2. Financial development, social capital and banking crises:

Few studies have looked at the role of trust in the development of financial markets (Guiso, Sapienza and Zingales, [2000], Calderón, Chong and Galindo, [2001], and Hong, Kubik and Stein, [2001]). Indeed, Guiso, Sapienza and Zingales [2000] found high correlation between the level of trust and financial development measures. In fact, their study of the northern and southern of Italy showed that in areas with high level of trust, individuals have much more access to credit, participate more to financial market and make less use of informal sources of funding.

Calderón, Chong and Galindo [2001] extended the empirical analysis to a large set of countries and found a significant association between high level of trust, financial and stock market development. In sum, it appears through the various empirical researches (cross-sectional comparisons or case studies of some countries) that trust is a significant determinant of financial sector development. In the analysis, funding activity is reduced to a simple financing transaction with a promise to repay the amount due. The success of the financing

transaction will depend, not only on institutional aspects (applicability of law, quality of bureaucracy), but also on the degree of confidence between the partners. In other words, compliance with the financial contract, established between the funder and the funded depends largely on the attitude of individuals to trust each other.

As a result, the level of trust, ceteris paribus, is likely to influence not only the financial market development, but also financial fragility. Indeed, the failure of financial contracts by the partners may increase the insolvency of agents and the reluctance of banks to respect its commitment. In other words, low level of social capital can also be responsible for the insolvency of agents and financial distress. When the company exchanges money with the bank with the implicit intention not to repay the amounts due, the use of financial contracts will be reduced and may lead to bank insolvency and fragility (Calderón, Chong and Galindo, [2001]).

4.3. Empirical methodology

The aim of the chapter is to analyze empirically the link between financial liberalization and financial fragility for a sample of developed and developing countries using a multivariate logit model for a period from 1980 to 2009. During this period, we have seen panoply of programs, and financial reforms led to the banking crisis in some countries. In the model the dependent variable, $y_{i,t}$ is equal to one $(y_{i,t} = 1)$ if the country i at time t is in crisis and otherwise its value is zero $(y_{i,t} = 0)$. The unobserved probability of banking crisis π_{it} is function of n independent variables (X_{it}) composed of macroeconomic variables and dummy variable of financial liberalization that takes the value one if the financial system is reformed and zero otherwise. As described above the multivariate logit model can be written as:

$$\pi_{i,t} = f(\beta' X_{it}), \tag{4.1}$$

where β means the vector of parameters and f is the standard logistic distribution function:

$$f(X) = \frac{e^X}{1+e^X},$$ (4.2)

The parameters of the model can be estimated using maximum likelihood method (see the appendix C.3, page 166).

4.4. Variables and data

Based on Laeven and Valencia [2010] criteria, the country is supposed to be in a crisis if there is "*significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and bank liquidations); and significant banking policy intervention measures in response to significant losses*". Six measures have been used to identify the period of banking crisis:

- extensive liquidity support (5% of deposits and liabilities to nonresidents),

- bank restructuring costs (at least 3% of GDP),

- significant bank nationalizations,

- significant guarantees put in place,

- significant asset purchases (at least 5% of GDP),

- deposit freezes and bank holidays.

The dependent variable in the model is a dummy variable, $DummyCrisis$, with the value equal to one, if the country is in the period of distress according to the criteria presented above. Otherwise, the value is zero. For example, if the period of the crisis in a country is 1992-1995, the dummy crisis takes the value one during the period of crisis and zero otherwise.

Regarding the extent of financial liberalization, the indicator often referred to by the empirical literature (Fry [1997]) is the liberalization of the real interest rate. In this chapter, the measure of financial liberalization is selected based on changes in financial policies like liberalization of real interest rate. The situation of real interest rate liberalization is when there

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is no ceiling on interest rate and it is determined under free market conditions. The real interest rate liberalization dummy variable, $Dummy\_Intlib$, takes the value one if the countries implemented the policy of the liberalization of the real interest rate and zero otherwise.

It is worth saying that there is the difference between countries in the process of reform's implementation; some countries have chosen a gradual approach (Japan, Greece, and Tunisia) and others rapid transition to market rules (Chile, Mexico, and Egypt). In our analysis we will consider the year of deregulation the real interest rate the starting point for these financial reforms.

Table 4.1 shows the different periods of real interest rate liberalization for each country.

Table 4.1. Period of interest rate liberalization and banking crisis

Country	Banking Crisis	Interest Rate Liberalisation	Country	Banking Crisis	Interest Rate Liberalisation
Australia	-	1980	**Italy**	2008-	1980
Austria	2008-	1981	**Japan**	1997-2001	1985
Bangladesh	1987	-	**Korea, Rep.**	1997-98	1984-1988,1991
Belgium	2008-	1986	**Mexico**	1981-85	1989
Canada	-	1980	**Morocco**	1980-84	1991
Chile	1976, 1981-85	1980	**Nigeria**	1991-95	1990
Colombia	1982, 1998-2000	1980	**Norway**	1991-93	1984
Denmark	2008	1981	**Philippines**	1983-86,1997-2001	1981
Egypt, Arab Rep.	1980	1991	**Poland**	1992-1994	-
Finland	1991-95	1986	**South Africa**	-	-
France	2008-	1980	**Spain**	1977-81	1980
Germany	2008-	1980	**Sweden**	1991-95,2008-	1980
Hungary	1991-95, 2008-	-	**Turkey**	1982-84	1980-82, 1984
Iceland	2008-	-	**United Kingdom**	2007-	1980
India	1993	1991	**United States**	1988, 2007-	1980
Indonesia	1997-2001	1983	**Uruguay**	1981-85	1980
Ireland	2008-	1985			

Sources: Demirgüç-Kunt and Detragiache [1998]; Glick and Hutchison [1999]; Bekaert, Harvey and Lundblad [2001, 2003]; Caprio and Klingebiel [1996, 2003]; Luc Laeven and Fabian Valencia [2010].

The set of explanatory variables used in the model describes the macroeconomic environment, different operations of banking intermediation and development of the institutional environment. Indeed, the first group includes some macroeconomic variables that are likely to capture the adverse effects of macroeconomic shocks on banking sector like quoted by Kaminsky and Reinhart [1996]. These variables are the real GDP per capita, $RGDP$, the real interest rate $Rrate$ and finally the inflation rate, Inf. We also introduced other variables such as the ratio of total debt service to export, $Debt$, and the ratio of loans to the private sector relative to GDP, $CSPY$, like in Demirguc-Kunt and Detragiache, [1997] and [1998].

The second subset of variables is restricted to the quality of institutional environment. For this, we used Kaufman, Kraay and Zoido-Lobatón [2010] composite measure of other institutional environment indicators, IQ. The indicators, used to build this measure are: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. High value of the institutional quality index IQ reflects good institutional environmental quality.

A suitable definition of social capital for an empirical analysis must identify observable and measurable indicators that can be used as a proxy for this variable (Portes, [2000]). However, measuring the social capital is not an easy task because it has many aspects and meaning. To do this, Putnam et al. [1993] for example, measures the social capital as: participation to elections and associations, reading newspapers. Social capital can also be measured by direct indicators, such as $Trust$ collected from a survey of the World Values Survey(WVS). It measures "*the percentage of people to trust each other*" in the community as in the work of Knack and Keefer [1997] and Zak and Knack [2001]. It is also worth noting that, like the institutional variables, social capital is not considered a direct determinant of probability of banking crisis, but it acts in an interaction term with the dummy for financial

liberalization since the level of social capital is likely to affect the degree to which the financial reform can lead to banking fragility. In other words, social capital does not act directly on the occurrence of the crisis, but it conditions the impact of liberalization policies that can succeed only if there is a high level of trust between the partners.

All variables are collected from International Financial Statistics (provided by the International Monetary Fund), the World Bank Development Indicators and Penn World database. The quality of institutional environment index is collected from Kaufman, Kraay and Zoido of-Lobatón [2010] database, and finally; the indicator of social capital is provided by the World Value Survey. The Table 4.2 summarizes the descriptive statistics of the list of variables is:

Table 4.2. Descriptive statistics of explanatory variables

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
Debt	%	375	26.254	12.916	0.669	86.723
CSPY	%	368	35.9	0.262	8.4	173.9
Inf	%	390	17.905	21.781	-14.172	131.901
Rrate	%	329	7.549	11.100	-32.057	93.915
Trust	%	240	21.199	9.546	5.500	47.050
RGDP	US$	390	4527.423	3076.367	701.310	12750.420
IQ	%	390	15.4	0.535	-123.7	124.8
Dummy_Intlib	-	390	0.764	0.425	0	1
Dummy Crisis	-	390	0.125	0.331	0	1

Source: Author's calculation.

4.5. Results

The results of the regression (4.1), as presented in the Table 4.3, reveal that banking crisis is more likely to occur in countries that have liberalized their financial systems. Also, it shows that an economy is assumed in crisis if there is extensive liquidity support (Laeven and Valencia [2010]). The likelihood ratio chi-square statistics in the Table 4.3 reveals that the model is valid at the 1% level of significance[49].

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[49] The likelihood ratio test was used to test the null hypothesis that vector of all coefficients except the constant term is equal to zero.

The coefficient associated to *Dummy_Intlib* is positive and significant at the 10% level of significance. Also, the probability of banking crisis is significantly associated at 1% level of significance with the ratio of debt service (relative to exports). Regarding the structure of the banking system, the likelihood of banking crises tends to be linked with a high ratio of credit to the private sector to GDP. The results also show that financial sector reform remains a significant factor that increases vulnerability of the banking system.

Table 4.3. Interest rate liberalization and banking crisis

Independent variables	Estimated coefficients
Constant	-7.798***
	(-4.55)
Growth	-0.184***
	(-4.44)
Debt	1.508***
	(3.19)
CSPY	1.050**
	(2.10)
Inf	0.907***
	(3.23)
Rrate	-0.065***
	(-3.02)
Dummy_Intlib	0.913*
	(1.68)
Log likelihood[50]	-80.24
Chi-square statistics	63.12***
Observations	294

Notes: the dependent variable is dummy crisis.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

The Table 4.4 presents the results of the test whether the effect of financial liberalization on the likelihood of banking crises depends on both the degree of institutional environment and economic development in the country. We tested whether the effect on the

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[50] The likelihood ratio chi-square test tells us that our model as a whole fits significantly better than an empty model.

fragility of banks is higher when the institutions fail to provide a proper environment that promotes optimal functionality of the financial sector. For this purpose, we introduce an interaction term between the institutional environment quality index and the dummy variable of financial liberalization. The output of the regression in the Table 4.4 shows that the coefficient of the interaction between institutional environment quality (IQ) and dummy financial liberalization is negative and significant at the 5% level of significance. This result shows that if the institutional environment is not sufficiently strong in terms of the legal framework, to protect the banking sector from risks, the financial liberalization policies are likely to have a negative impact on banking sector development and may lead to its fragility (Demirgüç-Kunt and Detragiache, [1997] and [1998]).

Table 4.4. Banking crisis and economic and institutional development

Independent variables	Estimated coefficients	
	(1)	(2)
Constant	-8.260*** (-4.81)	-9.209*** (-4.74)
Growth	-0.184*** (-4.25)	-0.189*** (-4.43)
Debt	1.745*** (3.57)	1.940*** (3.74)
CSPY	1.457*** (2.77)	1.604*** (2.72)
Inf	0.971*** (3.52)	1.118*** (3.55)
Rrate	-0.056** (-2.32)	-0.073*** (-3.01)
Dummy_Intlib	2.434*** (3.31)	1.208** (2.04)
Dummy Intlib* RGDP	-0.0003*** (-2.75)	-
Dummy Intlib* IQ	-	-1.283** (-2.29)
Log likelihood	-74.44	-77.16
Chi-square statistics	74.73***	69.29***
Observations	294	294

Notes: the dependent variable is dummy crisis.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Similarly, high degree of economic development in the country may reduce the adverse effect of financial reforms on banking sector. The output of the regression in the Table 4.4 shows that the coefficient of the interaction between the real GDP per capita $RGDP$ and the financial reform dummy is negative and significant at 1% level.

4.6. Financial liberalization, social capital and banking crisis

In this section and in the Table 4.5 we introduced the social capital, as measured by the level of trust as a factor capable of influencing the degree of which financial liberalization may affect the banking system. Indeed, the role of social capital has been identified in the empirical literature (Knack and Keefer, [1997]; and Zak and Knack, [2001]). Knack and Keefer [1997] attempted to test the relationship between the level of trust, civic cooperation and economic performance for a set of 29 market economies. These authors found that the indicator of social capital is positively and significantly connected with economic growth. This result has been confirmed later by Zak and Knack [2001] for a sample of 41 countries. According to Zak and Knack 15% increase in the level of trust between individuals increase almost by 1% the rate of economic growth (Zak and Knack, [2001]). Similarly, Beugelsdijk et al. [2004] showed robust relationship between trust and economic growth and added that the level of confidence in the economy is likely to explain differences in economic performance between countries.

Following the empirical study of Beugelsdijk et al. [2004] and Zak and Knack [2001], in this section, we will try to analyze the importance of social capital development in the process of financial liberalization reform. The social capital measure used in this section is the variable $Trust$ index taken from the World Values Survey (WVS) database. The estimated result of equation (4.1) presented in the Table 4.5 shows that the coefficient of the interaction between $Trust$ variable and the dummy of financial liberalization is negative and significant

at the 5% level of significance. This result shows that a society with a high level of trust and cooperation between individuals may reduce the harmful effects of financial liberalization policies on the banking system.

Table 4.5. Interest rate liberalization, banking crisis and trust

Independent variables	Estimated coefficients
Constant	-3.062 (-1.34)
Growth	-0.116 (-1.57)
Debt	0.703 (1.07)
CSPY	-0.089 (-0.15)
Inf	0.017 (0.83)
Rrate	-0.110** (-2.55)
Dummy_Intlib	2.368 (1.23)
Dummy_Intlib* Trust	-1.223** (-2.01)
Log likelihood	-37.89
Chi-square statistics	19.57***
Observations	182

Notes: the dependent variable is dummy crisis.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

4.7. Financial development, social capital, institutional environment and economic growth

Financial reforms and banking crises have also their effects on economic growth through financial development. Indeed, the vast literature on finance-growth relationship assumes that the major objective of financial liberalization is the development of the financial sector, which in turn promotes the long-term economic growth (Levine, [1997]). In turn, the banking crisis is likely to affect economic growth through its effect on the level of financial development.

To test empirically whether financial development tends to have positive effects on

economic growth, we compile in what follows, different regressions of economic growth equation, represented as follows:

$$Growth_t^i = \alpha_0 + \alpha_1 ln\left(Y_{0,t}^i\right) + \alpha_2 Trust_t^i + \alpha_3 FD_t^i + \alpha_4 Inf_t^i$$

$$+\alpha_5 Openness_t^i + \alpha_6 Gy_t^i + \varepsilon_t^i, \qquad\qquad (4.2)$$

where the dependent variable is the growth rate of real GDP per capita, $Growth$. The independent variables are initial real GDP per capita, Y_0, social capital measured as before, by the level of trust, $Trust$, institutional environment index and financial development, FD, which will be measured at each time with different indicator to test the robustness of the result. The financial development indicator will be measured either by the ratio of the broad money supply as percentage of GDP LLY, the ratio of financial savings to GDP QMY, or by the ratio of credit to the private sector to GDP $CSPY$. We added two others macroeconomic variables to control other economic phenomena: the inflation rate, Inf, openness rate, $Openness$, which measures the ratio of export and import to GDP, and finally, the ratio of public spending relative to GDP, Gy. The parameters α are coefficients, and ε is the error term. The descriptive statistics of the variables used in the equation are represented in the Table 4.6.

Table 4.6. Descriptive statistics

Variables	Unit	Observations	Mean	Std. Dev.	Min	Max
Growth	%	390	2.235	4.872	-16.550	20.450
Y_0	US$	390	3668.622	2580.116	716.050	9393.010
Trust	%	240	21.199	9.546	5.500	47.050
LLY	%	369	42.1	0.190	12.1	114.1
CSPY	%	368	35.9	0.262	8.4	173.9
QMY	%	366	35.7	0.164	08.1	93.5
Inf	%	390	17.905	21.781	-14.172	131.901
Gy	%	390	6.087	2.767	0.900	14.340
Openness	%	390	48.813	18.782	12.357	108.250

Source: Author's calculation.

The results of the estimation of the equation (4.2), using the ordinary least square method for panel data for the period 1980-2009, are presented in the Tables 4.7, 4.8 and 4.9. Two results emerge from these regressions: the first is that the social capital, as measured by the variable *Trust*, is positively and significantly associated with the growth rate of real GDP per capita. This result is consistent with the empirical literature in this subject (Knack and Keefer, [1997]; Zak and Knack, [2001]; and Beugelsdijk and al. [2004]). The second result shows that social capital is negatively correlated with the financial development coefficient in a significant way.

Table 4.7. The results of the equation with the broad money to GDP as explanatory variable

Independent variables	Estimated coefficients
Constant	4.918** (2.37)
Y_0	-0.589*** (-2.99)
Trust	0.875** (2.35)
LLY	-0.946*** (-2.72)
Inf	-0.031*** (-6.12)
Openness	0.413 (1.20)
Gy	-1.010** (-2.18)
R^2	0.10
Chi-square statistics	75.21***
Observations	716

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

The negative relationship between financial development and economic growth is also found valid with the different the two other measure of financial system development. In Table 4.8 the estimated coefficient by the variable representing credit to private sector as

percentage of GDP is negative and significant at 5% level of significance. However, the coefficient by interpersonal trust index is positively and significant at 5% level of significance.

Similarly, the Table 4.9 reveals that the variable representing the bank deposits to GDP is negatively and significantly linked with economic growth at 5% level of significance. All other macroeconomic control variables introduced in the regression have the expected signs except for the indicator for public spending relative to GDP.

Table 4.8. The results of the equation with the credit to private sector to GDP as explanatory variable

Independent variables	Estimated coefficients
Constant	4.979** (2.47)
Y_0	-0.557*** (-2.87)
Trust	0.877** (2.53)
CSPY	-0.526** (-2.16)
Inf	-0.030*** (-5.95)
Openness	0.411 (1.30)
Gy	-1.054** (-2.50)
R^2	0.09
Chi-square statistics	74.64***
Observations	719

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author′s calculation.

Table 4.9. The results of the equation with the financial savings to GDP as explanatory variable

Independent variables	Estimated coefficients
Constant	5.614***
	(2.86)
Y_0	-0.612***
	(-3.25)
Trust	0.812**
	(2.30)
QMY	-0.693**
	(-2.27)
Inf	-0.030***
	(-5.99)
Openness	0.338
	(1.03)
Gy	-0.960**
	(-2.18)
R^2	0.10
Chi-square statistics	74.44***
Observations	717

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Such negative effect of financial development on economic growth is not new in the empirical literature, especially when it comes to developing countries (De Gregorio and Guidotti, [1995]; Bethélemy and Varoudakiss, [1998]; and Trabelsi, [2004]). This could be due to instability and massive government intervention in financial systems of these countries. In what follows we shall examine the importance of social capital in the development of financial sector and check, whether the impact of the financial system on the economic activity is conditioned by the presence of kind of informal institutional quality like social norms and cooperation. The stylized form of the equation is as follows:

$$Growth_t^i = \beta_0 + \beta_1 ln(Y_{0,t}^i) + \beta_2 FD_t^i + \beta_3 Trust_t^i \times FD_t^i + \beta_4 Inf_t^i$$

$$+ \beta_5 Openness_t^i + \beta_6 Gy_t^i + \mu_t^i, \quad\quad\quad (4.3)$$

where: β are parameters and μ is the error term.

The result of the estimated equation (4.3) is presented in the Table 4.10. It reveals that the coefficients of the variables representing the interaction between financial development (measured as the ratio of broad money to GDP, LLY) and social capital ($Trust$) are positive and significant at 5% level of significance. This result shows that financial development can have a significant effect on economic growth only through a high level of trust in the community. In other words, the positive effect of financial development on economic growth is conditioned by the presence of a healthy social climate with a high levels of trust and cooperation among economic agents. Financial contracts can yield positive effects on capital accumulation, if there are good climates of trust among market players.

The close relationship between interpersonal trust and financial development is found to be valid when we change the measure of financial development. In the Table 4.11 the estimated coefficient of the interaction between the ratio of credit to private sector to GDP, $CSPY$, and interpersonal trust is positive at 5% level of significance. A similar result is also found when we estimated equation (4.3) using another measure of financial development. In the Table 4.12, the estimated coefficient of the interaction between the ratio of quasi money to GDP QMY, and interpersonal trust is also positive and significant at 5% of significance.

Table 4.10. Broad money and social capital

Independent variables	Estimated coefficients
Constant	4.918** (2.37)
Y_0	-0.589*** (-2.99)
LLY	-1.821*** (-3.55)
LLY*Trust	0.875** (2.35)
Inf	-0.031*** (-6.12)
Openness	0.413 (1.20)
Gy	-1.010** (-2.18)
R^2	0.10
Chi-square statistics	75.21***
Observations	716

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Table 4.11. Credit to private sector, social capital

Independent variables	Estimated coefficients
Constant	4.979** (2.47)
Y_0	-0.557*** (-2.87)
CSPY	-1.403*** (-3.20)
CSPY*Trust	0.877** (2.53)
Inf	-0.030*** (-5.95)
Openness	0.411 (1.30)
Gy	-1.054** (-2.50)
R^2	0.09
Chi-square statistics	74.64***
Observations	719

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Table 4.12. Bank deposit, social capital

Independent variables	Estimated coefficients
Constant	5.614***
	(2.86)
Y_0	-0.612***
	(-3.25)
QMY	-1.506***
	(-3.24)
QMY*Trust	0.812**
	(2.30)
Inf	-0.030***
	(-5.99)
Openness	0.338
	(1.03)
Gy	-0.960**
	(-2.18)
R^2	0.10
Chi-square statistics	74.44***
Observations	717

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Further analysis of the relationship between financial development, formal institutional quality and economic growth have been conducted in this chapter to determine whether a suitable formal institutional climate boosts the effect of financial development on economic growth. The model is written as follows:

$$Growth_t^i = \gamma_0 + \gamma_1 ln\left(Y_{0,t}^i\right) + \gamma_2 IQ_t^i + \gamma_3 FD_t^i + \gamma_4 Inf_t^i$$

$$+\gamma_5 Openness_t^i + \gamma_6 Gy_t^i + \pi_t^i, \qquad\qquad (4.4)$$

where: the γ are the coefficients and π is the error term.

The output of the regression (4.4) with the different specifications of financial development shows that there is significant negative relationship between financial system and economic growth. In the Table 4.13 the sign of the estimated coefficient of the variable

representing the ratio liquid liabilities to GDP is negative and significant at 1% level of significance. The coefficients of all other explanatory variables used in the model have the expected signs. The estimated coefficient of the variable $Openness$, institutional quality, IQ, and public spending, Gy, are positive; but, the coefficient of the variable inflation Inf is negative.

Table 4.13. Broad money, institutional environment and economic growth

Independent variables	Estimated coefficients
Constant	1.083 (0.36)
Y_0	-0.316 (-1.10)
IQ	0.821** (2.14)
LLY	-1.674*** (-4.13)
Inf	-0.031*** (-6.18)
Openness	0.823*** (2.11)
Gy	0.004 (0.01)
R^2	0.05
Chi-square statistics	58.83***
Observation	799

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
 Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

The negative connection between financial development and economic growth is also found valid when we change the measure of the financial system indicators. In the Table 4.14, the estimated coefficient of the ratio credit to private sector relative to GDP is negative and significant at 1% level of significance. Similarly, in the Table 4.15 the estimated coefficient of the variable QMY (the ratio of bank deposit to GDP) is negative and significant at 1% level of significance.

Such result can confirm the deficiency in liquidity allocation and the weak financial regulation and supervision. It appears that strong formal and informal institutional qualities are key growth factors. In fact, financial system facilitates the exchange of liquidity, helps to mobilize saving and reduces constraint on investment, enhances risk management, but in the absence of good governance, financial system will have difficulty to allocate and inject efficiently the money liquidity into the economic system.

Table 4.14. Credit to private sector, institutional environment and economic growth

Independent variables	Estimated coefficients
Constant	0.029 (0.01)
Y_0	-0.103 (-0.35)
IQ	0.914** (2.40)
CSPY	-1.268*** (-4.53)
Inf	-0.033*** (-6.48)
Openness	0.833** (2.18)
Gy	-0.282 (-0.51)
R^2	0.05
Chi-square statistics	63.32***
Observation	804

Notes: the dependent variable is the annual real GDP per capita growth rate.
*, **, *** correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Table 4.15. Bank deposit, institutional environment and economic growth

Independent variables	Estimated coefficients
Constant	1.752
	(0.58)
Y_0	-0.291
	(-1.01)
IQ	0.732*
	(1.90)
QMY	-1.216***
	(-3.29)
Inf	-0.030***
	(-6.02)
Openness	-0.680*
	(1.75)
Gy	-0.105
	(-0.19)
R^2	0.05
Chi-square statistics	50.70***
Observation	805

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

To analyze further the importance of formal institutional quality in the financial activity, we will estimate the following model:

$$Growth_t^i = \delta_0 + \delta_1 ln\left(Y_{0,t}^i\right) + \delta_2 FD_t^i + \delta_3 IQ_t^i \times FD_t^i + \delta_4 Inf_t^i$$
$$+\delta_5 Openness_t^i + \delta_6 Gy_t^i + \tau_t^i, \qquad\qquad (4.5)$$

where the δ refers to the coefficients and τ is the error term.

The output of the estimated equation (4.5) in the Table 4.16 shows that if we interact the measure of institutional quality with the financial development indicator, the coefficient of the variable representing the financial development (measured as the ratio of broad money to GDP, LLY) becomes positive and significant. Such result confirms that high level of

institutional environment quality is important to capture the positive return of financial development on economic growth.

Table 4.16. Broad money, institutional environment

Independent variables	Estimated coefficients
Constant	1.083 (0.36)
Y_0	-0.316 (-1.10)
LLY	-2.496*** (-3.99)
LLY*IQ	0.821*** (2.14)
Inf	-0.031*** (-6.18)
Openness	0.823** (2.11)
Gy	0.004 (0.01)
R^2	0.05
Chi-square statistics	58.83***
Observation	799

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

The results in the Tables 4.17 and 4.18 confirm the positive relationship between the quality of institutional environment and the development of the financial system. In the Table 4.17 the coefficient of the variable representing the interaction between the institutional quality and the ratio of credit to private sector relative to GDP reveals to be positive and significant at 5% level of significance. The same result is also valid in the Table 4.18 if we use the variable of the ratio bank deposit to GDP as an indicator of financial development. The coefficient of the variable representing the interaction between the institutional quality and financial development indicator is positive and significant at 10% level of significance. Such result comes in line with Demetriates and al. [2004] and Bousrih et al.[2005] studies of

the positive relation between quality of finance, quality of financial regulation and rule and

economic growth.

Table 4.17. Credit to private sector, institutional environment

Independent variables	Estimated coefficients
Constant	0.029 (0.01)
Y_0	-0.103 (-0.35)
CSPY	-2.183*** (-4.13)
CSPY*IQ	0.914** (2.40)
Inf	-0.033*** (-6.48)
Openness	0.833** (2.18)
Gy	-0.282 (-0.51)
R^2	0.05
Chi-square statistics	63.32***
Observation	804

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
 Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

Table 4.18. Bank deposit, institutional environment

Independent variables	Estimated coefficients
Constant	1.752 (0.58)
Y_0	-0.291 (-1.01)
QMY	-1.949*** (-3.27)
QMY*IQ	0.732* (1.90)
Inf	-0.030*** (-6.02)
Openness	0.680* (1.75)
Gy	-0.105 (-0.19)
R^2	0.05
Chi-square statistics	50.70***
Observation	805

Notes: the dependent variable is the annual real GDP per capita growth rate.
∗, ∗∗, ∗∗∗ correspond to 10%, 5% and 1% of significance, respectively.
 Figure between brackets represents values of Student's t-statistics.
Source: Author's calculation.

4.8. Concluding remarks

This analysis attempts to test empirically whether financial reforms tend to have adverse effects on the stability of the banking sector. To this end, we chose a sample of 33 developed and developing countries with the different levels of institutional development that have experienced financial liberalization during the period 1980-2009. Regressions were performed using the multivariate logit model based on panel data.

Three results are highlighted in this chapter:

- *First*, the probability of occurrence of banking crises is higher in countries that have reformed their financial systems.

- *Second*, the development of the institutional environment plays an important role in reducing the likelihood of banking crisis.

- *Third*, the development of social infrastructure with high levels of trust and cooperation between individuals and agents within the economy may reduce the risk of banking crises.

- *Finally,* the level of confidence in an economy constrains the impact of financial development on economic growth for the set of countries in the sample.

Favorable formal and informal institutional environment can play a key role for the consolidation of financial institutions by strengthening the regulatory framework and improving the performance of backbone infrastructure of the sector in terms of governance and financial transactions management. The development of financial institutions requires not only an increase in the monetary resources, but also an amelioration of the level of social capital that provides the basis for collective action and generates a better sense of community spirit between people that have respect for rules of laws.

Conclusions

The research conducted in this thesis emphasises on the positive relationship between social capital, institutional quality and economic growth. In fact, the basic idea is that social capital dynamic can improve communication between people, generates cooperation that can later have benefits for individual's social life and also for the community in general. Colman [1988] one of the leading pioneers in the field suggested that there is: "*some aspect of the social structures facilitates certain actions of actors within the structure*". However, this statement was subject to different critics because of its ambiguous mechanism to understand how social network, trust and loyalty of people can influence economic activity and impact positively on the economic development. Also, how can good social environment and high level of trust between people in the community can lead to better functionality of institution in the country.

In the current work, we tried to address one of the issues of the theoretical and empirical literature relative to the mechanisms through which social capital can on the one hand secure individual well-being in the society and on another influence economic growth positively. To analyze this concept of social capital, we developed three different empirical models, each highlighting one of the mechanisms through which individual network, trust, and civic society can impact positively on economic performance.

The first empirical model carried out in chapter, *first*, for a set of 85 countries, and *second* for sub-set of countries with different levels of income and institutional quality during the period 1980-2009 and relative to the transmission channels of social capital to economic growth highlights the following findings:

First, the level of trust, as a measure of social capital, and economic growth are significantly and positively correlated. *Second*, a high level of trust also may influence positively economic activity in the country through its effect on financial development, human capital, investment and institutional quality. Such results are found to be robust statistically with the extreme bound analysis (EBA). It corroborates the fact that an improvement of the social infrastructure with high levels of trust and cooperation between individuals has not only a direct but also an indirect effect on economic growth through financial developments, investment, human capital, and institutional quality in the economy.

It is also worth mentioning that the corresponding analysis of the impact of social capital and its transmission channels on economic growth shows that for the subset of countries with different levels of institutional quality and different levels of income the result of the positive impact of social capital on economic growth is still valid, however, differences are noted with the other determinant of economic growth like the financial development. In some cases the estimated coefficient enters with unexpected negative sign. Such finding led us to examine deeply such relationship, try to explain what are the reasons behind the weakness effect of the financial system on economic growth? and show the importance of the development of informal institutions, as measured by the indicator of social capital, and the development of formal institutions, as measured by the institutional quality index calculated by Kaufman and Kraay, to the development of the financial system and long-term economic growth.

In chapter three we analyzed the association between financial developments, formal and informal institution and long-term economic growth using the dynamic panel system GMM model for a sample of 85 countries and subset of groups with the criteria of high

income and medium to low income countries, also for groups of countries with high control of corruption and medium to low control of corruption during the period of 1980-2009.

The output of the regression reveals two main results: *first*, there is a positive relationship between social capital, measured by trust, financial development and long-term economic growth. *Second*, there is a positive relationship between the quality of formal institutions, financial development and long run economic growth. These results are statistically robust. In addition, improvements in the quality of formal institutions such as rules of laws and in the quality of informal institutions such as the levels of trust and cooperation among individuals in society also play an important role in the development of financial institutions and economic growth in the long run.

The third and final empirical model addresses a particular case and attempts to test the link between financial liberalization and banking crises as well as to analyze if the probability of banking crises depends on factors other than those related to market conditions, i.e. on the quality of the environment institution or the degree of trust between different actors within the economy. For this reason, we chose a sample of 33 developed and developing countries with different levels of institutional development using Kaufman and Kraay index [2010]. Regressions were performed using the logit model and multivariate panel data.

Three results are highlighted in this chapter: *first*, the probability of occurrence of banking crises is higher in countries that have reformed their financial systems. *Second*, the development of the institutional environment plays an important role in reducing the likelihood of crisis. *Finally*, the development of social infrastructure with a high level of trust and cooperation between individuals and agents of the economy may reduce the risk of banking crises. The level of confidence in an economy constrains the effect of financial development on economic growth for the set of countries in the sample.

Although there is clearly strong attention of the importance of social capital in improving institutional quality and long-term economic growth; however, further research needs to be done in the field to refine the framework which comprises different dimensions and components of social capital in a way that will facilitate its measurement. It may be difficult to find a unique and more concrete measure of social capital but researches methodologies including quantitative and qualitative factors that influence social capital can be helpful to calculate a standard proxy for social capital. Why is it important?

In fact, the measurement of social capital can help at certain point economist, sociologist as well as politician to evaluate how well country's socioeconomic strategies and policy instruments are benefic for the well-being of people in the community. At the same time, it can ease the way for policy maker to set proper reforms that promote "*good governance*" and build healthy institutional systems where people obey the law and work together for the benefit of the community, and also provides conducive atmosphere for long-term economic growth. At the aggregate level, promoting institutions that foster community, take measures that facilitate mutual trust appear important to the economic development, as institution is the central pillar of economic activity and can be related to both, incentives and factors, which may inhibit the positive evolution of economic activity and also people well-being.

In fact, an extensive future research studies theoretical as well empirical are requested to narrow these gap between micro and macro themes especially related to institution issues. Also, construct theoretical model of social capital and economic growth for a separate group of countries with different levels of income, developed and developing, can be useful to analyze deeply the mechanism through which social capital can have a positive influence on economic activities and taking into account the composition and some structural components that specify each group of countries.

References

Acemoglu, D., Johnson, S., Robinson, J., and Thaicharoen YunYong [2002], "Institutional Causes, Macroeconomic Symptoms, Volatility, Crises and Growth", *NBER WP* 9124.

Ahlerup, Olsoson and Yanagizawa [2009], "Social Capital vs. Institution in the growth process", *European journal of Political Economy*, 25: 1-14.

Alesina, Alberto F and La Ferrara, Eliana, [2000], "Who Trusts Others?", CEPR Discussion Papers 2646, C.E.P.R. Discussion Papers.

Anderson, T.W. and Hsiao, C. [1982], "Formulation and Estimation of Dynamic Models Using Panel Data", *Journal of Econometrics*, 18: 47.82.

Arellano, M. and Bond, S. [1991], "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations", *Review of Economic Studies*, 58, 277-297.

Arellano, M. and Bover, O. [1995], "Another Look at the Instrumental Variable Estimation of Error Components Models", *Journal of Econometrics*, 68: 29-51.

Arellano, M. [2003], "*Panel Data Econometrics*", Oxford University Press.

Arrow, K. [1972], "Gifts and Exchanges", *Philosophy and Public Affairs,* 1: 343-362.

Backhouse, R. [1991], "*A history of Modern Economic Analysis*", Oxford, UK: Basil Blackwell.

Bagehot, W. [1873], "*Lombard Street: A Description of the Money Market*", London: John Murray.

Banfield, E.G. [1958], "*The moral basis of a backward society*", New York: Free Press.

Barbier, E.B. [1987], "the concept of sustainable economic development", *Environmental Conservation*, vol.14, no.2.

Barro, R.J. [1991], "Economic growth in a cross section of countries", *The Quarterly Journal of Economics*, vol.106, no. 2: 407-43.

Barro, R.J. and Lee, J.W. [1994], "Sources of Economic Growth", *Carnegie Rochester Conference Series on Public Policy*, vol. 40: 1-46

Barro, R.J. [1996], "Determinants of economic growth: A cross-country empirical study", NBER Working Paper no. 5698. Cambridge, MA: National Bureau of Economic Research.

Barth, J. R., Nolle, D. E., Phumiwasana, T. and Yago, G. [2002], "A Cross-Country Analysis of the Bank Supervisory Framework and Bank Performance", *Economic and Policy Analysis Working Paper* 2002-2.

Bartlett,W., Čučković,N., Jurlin, K., Nojković,A. and Popovski,V. [2013], "Institutional quality and growth in EU neighbourhood countries", *European Commission Research Area WP5/11.*

Becker, G. [1974], "A theory of social interactions", *Journal of Political Economy* 82: 1063–93.

-------------- [1996], "*Accounting for tastes*", Cambridge, MA: Harvard University Press.

Bekaert, G., Harvey, C. R. and Lundblad, C. [2001], "Does Financial Liberalization Spur Growth?", *NBER Working Paper* n° 8245.

--[2003], "Equity Market Liberalization in Emerging Markets", *Journal of Financial Research*, Southern Finance Association & South western Finance Association, vol. 26, no.3: 275-299.

Bénabou, R. [1996], "Heterogeneity, stratification and growth: Macroeconomic implications of community structure and school finance", *American Economic Review* 86: 584–609.

Bencivenga, V. R. and Smith, B. D. [1991], "Financial Intermediation and Endogenous Growth", *Review of Economic Studies,* 58: 195-209.

Berthememy, J.C. and Varoudakis, A. [1998], "Développement financier, réformes financières et croissance : Une approche en données de panel", *Revue économique,* vol. 49, no.1: 195-206.

Beugelsdijk, S. [2006], "A note to the theory and measurement of trust in explaining differences in economic growth", *Cambridge Journal of Economics* 30: 371–87.

Beugelsdijk, S., and T. Van Schaik. [2005], "Social capital and growth in European regions: An empirical test", *European Journal of Political Economy*, vol. 21, no. 2: 301–24.

Beugelsdijk, S., H. De Groot, and T. Van Schaik. [2004], "Trust and economic growth: A robustness analysis", *Oxford Economic Papers* 56: 118–34.

Beugelsdijk, S. and Smulders, S. [2009], "Bonding and Bridging Social Capital and Economic Growth", *CentER discussion paper* no. 2009–27.

Bjornskov, C. [2009], "Social trust and growth of schooling", *Economic of Education Review*, vol 28: 249-257.

Blundell, R. And Bond, S. [1998], "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, 87: 115-143.

Bofota Y. B. [2012], "Social Capital, Human Capital and Economic Development: Theoretical Model and Empirical Analyses", *Presses Universitaires de Louvain, These de l'Universite Catholique de Louvain.*

Bourdieu, P. [1980], "Le capital social", *Actes de la Recherche en Sciences Sociales*, vol.31:2–3.

------------------ [1986], "The form of capital", In *Handbook of theory and research for the sociology of education*, ed. J.G. Richardson. 241–58. New York: Greenwood Press.

Bowles, S., and H. Gintis. [2002], "Social capital and community governance", *Economic Journal* 112: 419–36.

Buchel, F., and Duncan, G. [1998], "Do parents' social activities promote children's schooling attainments? Evidence from the German socio-economic panel", *Journal of Marriage and the Family* 60: 95–108.

Barth, J.R., Nolle, D.E., Phumiwasana, T., and Yago, G. [2002], "A Cross-Country Analysis of the Bank Supervisory Framework and Bank Performance", *Economic and Policy Analysis Working Paper* 2002-2.

Berthelemy, J.C., Varoudakis, A. [1995], "Thresholds in Financial Development and Economic Growth", *Manchester School of Economic and Social Studies*, 63, 70-84.

Blundell, R., and Bond, S. [2000], "GMM Estimation with Persistent Panel Data: An Application to Production Functions", *Econometric Review*, 87, 115-143.

Bjørnskov, C. [2009], "Social trust and the growth of schooling", *Economics of Education Review*, Elsevier, vol. 28: 249-257.

Boulila, G., and Trabelsi, M. [2004], "The Causality Issues in the Finance and Growth Nexus: Empirical Evidence from Middle East and North African Countries", *Review of Middle East Economics and Finance*, vol.2, no. 2: 35- 50.

Bousrih, L. and Trabelsi, M. [2005], "Financial Liberalization, Financial development and Banking Crises: the Role of Social Capital", *Revue d'Economie Financière*, vol.81: 83-106.

Bousrih, L., Boulila, G. and Trabelsi, M. [2008], "Social Capital and Economic Growth: Empirical Investigation on the transmission channel", *International economic journal*, vol. 22: 399-417.

Bousrih, L. [2012], "Finance and Long Run Growth: The Role of Formal and Informal Institutions", *Gospodarka Narodowa*, no. 9: 1-13.

Bousrih, L. [2013], "Social capital, human capital and sustainable economic development", *Poznan University of Economics Review*, vol. 13, no. 3: 43-54.

Brundtland Commission [1987], "Our Common Future", Report of the *World Commission on Environment and Development, United Nations.*

Calderón, C., A. Chong, and A. Galindo. [2001], "Structure and development of financial institutions and links with trust: cross-country evidence", *Inter-American Development Bank*. Research Department Working Papers no. 444.

Caprio, G., and Klingebiel, D. [1996], "Bank Insolvencies. Cross-Country Experience", *Policy Research WP* 1620, World Bank.

Caprio, G., and Klingebiel, D. [2003], "Episodes of Systemic and Borderline Financial Crisis", Word Bank.

Caprio, G., and Summers L. [1994], "Finance and its Reform: Beyond Laissez-Faire", *World Bank Policy Research Working Papers*, no. 1171.

Cass, D. [1965], "Optimum growth in an aggregate model of capital accumulation", *Review of Economic Studies* 32: 232-240.

Chari, V. and Jagannathan, R. [1988], "Banking Panics, Information and Rational Expectations Equilibrium", *Journal of Finance,* 43: 749-761.

Chenery, H. (1975) "The Structuralist Approach to Development Policy", *The American Economic Review*, vol. 65, no.2: 310-316.

Coleman, J.S. [1988], "Social capital in the creation of human capital", *American Journal of Sociology* 94: 95–120.

-------------------- [1990], "*Foundations of social theory*", Cambridge, MA: Harvard University Press.

Dasgupta, P. [2000], "Economic progress and the idea of social capital", In *Social capital: A multifaceted perspective*, eds P. Dasgupta and I. Serageldin. 325–42. The World Bank.

Dasgupta, P. [2005], "Economics of Social Capital", *The Economic Record*, vol.81, no.255: 2-21.

De Gregorio, J. and Guidotti, P. [1995], "Financial Development and Economic Growth", *World Development,* 23, March: 433-438.

Demetriades, P.O. and Andrianova, S. [2004], "Finance and Growth: what we know and what we need to know", Goodhart, C.ed, *Money, Finance and Growth*, Routledge.

Demirguça-Kunt, A. and Detragiache, E. [1997], "The determinants of banking crises in developing and developed countries", *IMF Staff Papers,* 45: 81-109.

Demirguça-Kunt, A. and Detragiache, E. [1998], "Financial Liberalization and Financial Fragility", *IMF Working papers* WP/98/83. Washington DC, International Monetary Fund.

Diamond, D. W. and Dybvig P. H. [1983], "Bank Runs, Deposit Insurance, and Liquidity", *Journal of Political Economy,* 91: 400-419.

Domar, E. (1946). "Capital Expansion, Rate of Growth, and Employment", *Econometrica* vol.14, no. 2: 137–147.

Durlauf, S.N. [2002], "Symposium on Social Capital: Introduction", *Economic Journal,* 112: 417-418.

Durlauf, S.N. [2002], "On the Empirics of Social Capital", *Economic Journal,* 112: 459-79.

Edison, H. [2003], "How Strong are the Links between Institutional Quality and Economic Performance", *Finance and Development,* [June]: 35-37.

Edwards, S. [2001] "Capital Flows and Economic Performance: Are Emerging Economies Different?", *NBER Working Paper* n° 8076 [January].

Fukuyama, F. [1995], *"Trust: The Social Virtues and the Creation of Prosperity"*, New York, United Free Press.

Fry, M. J. [1997], "In Favour of Financial Liberalization", *Economic Journal,* 107: 754-770.

Gavin, M. and Hausmann, R. [1996], "The Roots of Banking Crises: the Macroeconomic Context", *Inter-American Development Bank working paper*: no.318.

Glaeser, E.L.; Laibson, D. And Sacerdote, B. [2000], "The economic approach to social capital", *NBER working paper* 7728.

Glick, R. and Hutchison, M. [1999], "Banking and Currency Crises: How Common are Twins?", *Pacific Basin Working Paper series* WP N° PB 99-07.

Goldin, C., and L.F. Katz. [1999], "Human capital and social capital: The rise of secondary schooling in America, 1910 to 1940", *Journal of Interdisciplinary History* 29: 683–723.

Goldsmith, R.W. [1969], "*Financial Structure and Development*", New Haven: Yale University Press.

Goodland, R. [1995], "The concept of Environmental Sustainability", *Annual Review of Ecology and Systematic,* vol. 26:1-24.

Gradstein, M., and M. Justman. [2002], "Education, social cohesion and economic growth", *The American Economic Review*, vol.92, no. 4: 1192–1204.

Granovetter, M. [1985], "Economic Action and Social Structure: The Problem of Embeddedness", *American Journal of Sociology*, vol.91, no. 3: 481–510.

Gratton. L. and Ghoshal, S. [2003], "Managing personal human capital: New ethos for the 'volunteer' employee", *European Management Journal*, 21: 1-10.

Greenwood, Jeremy and Jovanovic, Boyan [1990], "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, vol.98, no.5: 1076-1107.

Grossman, G. M., and Helpman, E. [1991], "Trade, Knowledge Spillovers and Growth", *European Economic Review*, vol:35, no:3: 517-26.

Guiso, L., Sapienza, P., and Zingales, L. [2000], "The Role of Social Capital in Financial Development", *NBER Working Papers* no. 753.

Gurley, J.G., and Shaw, E.S. [1955], "Financial Aspects of Economic Development", *The American Economic Review*, 45: 515-538.

Hanifan, L.J. [1916], "The rural school community centre", *Annals of the American Academy of Political and Social Sciences* 67: 130–138.

Helliwell, J. [1996], "Economic growth and social capital in Asia", NBER Working Papers, no. 5470.

Helliwell, J., and R. Putnam. [1999], "Education and social capital", NBER Working Paper no. 7121.

Hellmann, T., M. and Stiglitz, J. [1994], "Addressing Moral Hazard in Banking: Deposit Rate Controls vs Capital Requirements", *unpublished paper*.

Holdren, J. P., Daily, G. C. and Ehrlich, P. R. [1995], "*The meaning of sustainability: biogeophysical aspects*", The Bio geophysical Foundations, ed. Mohan Munasinghe and Walter Shearer, Distributed for the United Nations University by the World Bank, Washington, D.C.

Homans, G. [1961], "*Social behaviour: its elementary forms*", New York: Harcourt, Brace and World.

Hong, H., Kubik, J. D. and Stein, J. C. [2001], "Social Interaction and Stock Market Participation", *NBER Working Papers* n° 8358.

Ian Falk [2000], "Human Capital and Social Capital: What's the difference?", *Adult Learning Commentary,* N.28, the Centre for Research and Learning in Regional Australia (CRLRA) University of Tasmania, Launceston.

Israel, G.L. and Beaulieu, [1995], "Influence of social capital on public high school dropouts: Re-examining the rural-urban context", Paper presented at the Annual Meeting of the Rural Sociological Society, Washington, DC.

Jacobs, J. [1961], "*The death and life of great American cities*", New York, Random House.

Kaminsky, G. L. and Reinhart, C. M. [1996], "The Twin Crises: the Causes of Banking and Balance-of- Payments Problems", *International Finance Discussion Paper* no. 544.

Kaufmann, D., A. Kraay, and M. Mastruzzi. [2010], "The Worldwide Governance Indicators: Methodology and Analytical Issues", The World Bank.

Keynes, J.M. [1936], "*The General Theory of Employment, Interest and Money*", Palgrave Macmillan.

Kindleberger, C. P., Robert Z. Aliber [2011], *"Manias, Panics and Crashes: A History of Financial Crises"*, Palgrave Macmillan.

King, R. G. and Levine, R. [1993a.], "Finance and Growth: Schumpeter Might be right", *Quarterly Journal of Economics,* 108: 717-737.

------------------------------------- [1993b], "Finance, Entrepreneurship and growth: Theory and evidence", *Journal of Monetary Economics,* 32: 513-542.

Kiyotaki, N. and Moore, J. [1997], "Credit Cycles", *Journal of Political Economy,* 105: 211-48.

Kling, J. and Pritchett, L. [1994], "Where in the world is population growth bad?", *World Bank. Policy Research Working Paper* 1391.

Knack, S., and P. Keefer. [1997], "Does social capital have an economic payoff? A cross-country investigation", *Quarterly Journal of Economics*: 1252–87.

Koopmans, T. [1965], "On the concept of optimal economic growth", *Pontificae Academiae Scientiarum Scripta Varia*, vol. 28: 225-287.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny. [1997], "The Legal Determinants of External Finance", *Journal of Finance,* 52: 1131-1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny. [1997], "Trust in large organizations", *American Economic Review* 87: 333–338.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny. [1998], "Law and Finance", *Journal of Political Economy,* 106: 1113-1155.

La Porta, R., Lopez-de-Silanes, F., and Shleifer, A., and Vishny, R.W. [1999], "The Quality of Government", *Journal of Law, Economics and Organization*, 15[1]: 222-279.

Leamer, E.E. [1985], "Sensitivity analysis would help", *American Economic Review* 75: 308–313.

Levine, R. [1997], "Financial Development and Economic Growth: Views and Agenda", *Journal of Economic Literature,* 25: 688-726.

Levine, R. [1998], "The Legal Environment, Banks, and Long-Run Economic Growth", *Journal of Money, Credit, and Banking,* 30: 596-613.

Levine, R., and D. Renelt. [1992], "Sensitivity analysis of cross country growth regressions", *American Economic Review* 82: 942–963.

Lingren,C. J, Garcia, G. and Saal, M. [1996], "Bank Soundness and Macroeconomic Policy", IMF, Washington D.C.

Ljungberg, J. [2002], "About the Role of Education in Swedish Economic Growth, 1867-1995", *Historical Social Research*, vol. 27(4): 125-139.

Lynch, J. W., Kaplan, G. A. and Salonen, J. T. [1997], "Why do poor people behave poorly? Variations in adult health behaviour and psychosocial characteristics, by stage of the socioeconomic lifecourse", *Soc Sci Med*, 44: 809–820.

Lynch, J.W., P. Due, C. Muntaner, D. Smith [2000], "Social Capital - Is it a good investment strategy for public health?", *Journal Epidemiology Community Health* 54, 404-408.

Loury, G. [1977], "A dynamic theory of racial income differences", In *Women, minorities, and employment discrimination*, eds P.A. Wallace and E. Le Mund. Lexington, MA: Lexington Books.

Luc Laeven and Fabian, V. [2010], "Resolution of Banking Crises: The Good, the Bad, and the Ugly", IMF WP/10/146.

Lucas, R.E. [1988], "On the mechanics of economic development", *Journal of Monetary Economics* 22: 3-42.

Malthus, T. [1798], "*An Essay on the Principle of Population*", Joseph Johnson, London.

Malaga, K. [2011], "The main strands and dilemmas of contemporary economic growth theory", *Argumenta oeconomica* , vol. 1: 17-42

Mankiw, G., D. Romer, and D. Weil. [1992], "A contribution to the empirics of economic growth", *Quarterly Journal of Economics* 107: 407–437.

McKinnon, R.I. [1973], "*Money and Capital in Economic Development*," Washington D.C.: The Brookings Institution.

McKinnon, R.I. [1988], "Financial liberalization in Retrospect: Interest Rate Policy in LDC's", in *The State of Development Economics* [eds. G. Ranis and T. P. Stulz]. Oxford: Basil Blackwell: 386-415.

Menard, C. [2004], "The Economics of Hybrid Organizations", *Journal of Institutional and Theoretical Economics*, vol.160:345-376.

Menard, C. and Shirley, M.M. [2005], "*Handbook of New Institutional Economics*", Springer.

Miguel, E., P. Gertler, and D. Levine. [2005], "Does social capital promote industrialization? Evidence from a rapid industrialize", *Review of Economics and Statistics* 87(4): 754–762.

Mishkin, F. [1978], "The Household Balance Sheet and the Great Depression", *Journal of Economic History,* 38: 918-37.

Mogues, T. and Carter, M. R., [2005], "Social Capital and the reproduction of economic inequality in polarized societies", *Journal of Economic Inequality*, vol.3: 193 – 219.

Nahapiet, J. and Ghoshal, S. [1998], "Social Capital, Intellectual Capital, and the Organizational Advantage", *The Academy of Management Review*, vol. 23, no. 2: 242-266.

North, D.C. [1990], *"Institutions, institutional change, and economic performances"*, Cambridge: Cambridge University Press.

North, D. [2005], *"Understanding the Process of Economic Change"*, Princeton University Press.

Nunes, A. B., [2003], "Government Expenditure on Education, Economic Growth and Long Waves. The Case of Portugal", *Paedagogica Historica*, vol.39, no.5: 559-581.

OECD, [2001], *"The Wellbeing of Nations: The Role of Human and Social Capital, Education and Skills"*, OECD Centre for Educational Research and Innovation, Paris, France.

Olson, M., [1982], *"The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities"*, Yale University Press.

Organization for Economic Cooperation and Development [1990], *"Issues papers: On Integrating Environment and Economics"*, OECD, Paris.

Olson, M. [1982], *"The rise and decline of nations"*, New Haven: Yale University Press.

Ostrom, E. [2000], "Collective Action and the Evolution of Social Norms", *The Journal of Economic Perspective*, vol. 14, no.3: 137-158.

Paldam, M., Svendsen, G.T. [2004], *"Social capital and economics"*, Cpt 12, 231-52, in Flap, H., Völker, B., eds., *Creation and returns of social capital.* Routledge (Advances in Sociology), London and NY.

Patrick, H.T. [1966], "Financial Development and Economic Growth in Underdeveloped Countries", *Economic Development and Cultural Change,* vol.14, no.2: 174-189.

Portes, A. [2000], "The two meanings of social capital ", *Sociological Forum*, 15, 1: 1-12.

Putnam, R. [1995], "Tuning in, Tuning out: The Strange Disappearance of Social Capital in America", *Political Science and Politics*, vol.28, no.4: 664-683.

Putnam, R., Leonardi R. and Nanetti R. [1993], *"Making Democracy Work: Civic Traditions in Modern Italy"*, Princeton, NJ: Princeton University Press.

Pryor, F. [2005], "National values and economic growth", *American Journal of Economics and Sociology* 64, no. 2: 451–483.

Ramsey F.P. (1928), "A Mathematical Theory of Saving", *Economic Journal*, Vol. 38, No 152: 543-559.

Ricardo, D. [1951], *"On the Principles of Political Economy and Taxation"*, 1st ed. 1817, 3rd ed. 1821. In vol. I of *The Works and Correspondence of David Ricardo*, edited by Piero Sraffa with the collaboration of Maurice H. Dobb, Cambridge: Cambridge University Press.

Rogers, Adam [1993], *"The Earth Summit: A Planetary Reckoning"*, Global View, Los Angeles.

Romer, P. M. [1986], "Increasing Returns and Long-Run Growth", *The Journal of Political Economy*, Vol. 94, No. 5: 1002-1037.

Rose, R., [2000], "Getting things done in anti modern society: social capital networks in Russia", in *Social capital: A multifaceted Perspective*, ed. P. Dasgupta and I. Serageldin, The World Bank.

Rupasingha, A., Goetz, S. J. and Freshwater, D., [2006], "The Production of social capital in U.S. countries", *The Journal of Socio-Economics*, vol.35: 83 – 101.

Roubini, N. and Sala-I-Martin [1992], "Financial Repression and Economic Growth", *Journal of Development Economics,* 39: 5-30.

Roubini, N. and Sala-I-Martin [1995], "A Growth Model of Inflation, Tax Evasion and Financial Repression", *Journal of Monetary Economics,* 35: 275-301.

Routledge, B., and J. von Amsberg. [2003], "Social capital and growth", *Journal of Monetary Economics*, vol. 50, no. 1: 167–93.

Saint-Paul, G. [1992], "Technological Choice, Financial Markets and Economic Development", *European Economic Review*, vol.36, no.4: 763-781.

Sala-I-Martin, X. [1997], "I just ran two million regressions", *American Economic Review* 87: 178–183.

Schumpeter, J. [1912], *"The Theory of Economic Development"*, Leipzig: Dunker & Humblot, translated by R Opie. Cambridge, MA: Harvard U. Press, 1934.

Sen, A. [1999], *"Development as Freedom"*, Oxford: Oxford University Press.

Shaw, E.S. [1973], *"Financial Deepening in Economic Development"*, New York: Oxford University Press.

Sheng, A. [1995], "Bank Restructuring", Washington D.C, the World Bank.

Shleifer, A. et al. [2003], "The New Comparative Economics", *Journal of Comparative Economics*, vol. 31: 595-619.

Smith, A. (1776), *"An Inquiry into the Nature and Causes of the Wealth of Nations"*, (1st ed.), London: W. Strahan.

Solow, R. M. [1956], "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics*, vol. 70, no. 1: 65–94.

Stiglitz, J.E. [1994], "The Role of the State in Financial Markets", in M. Bruno and B. Pleskovic [eds]. Proceeding of the World Bank Annual Conference on Development Economics Washington D.C. World Bank.

Swan, T. W. [1956], "Economic Growth and Capital Accumulation", *Economic Record*, vol. 32, no. 2: 334–361.

Szreter, S. [2000], "*Social capital, the economy, and education in historical perspective*", P: 56-77 in *Social Capital: Critical Perspectives*, edited by Tom Schuller. Oxford: Oxford University Press.

Temple, J., and P.A. Johnson. [1998], "Social capability and economic growth", *Quarterly Journal of Economics* 113, no. 3: 965–990.

Temple, J., and P.A. Johnson. [2001], "Growth effects of education and social capital in the OECD countries", *OECD Economic Studies* 33: 57–101.

Todaro, M. P. [1995], "*Reflections on Economic Development: The Selected Essays of Michael P. Todaro*", Edward Elgar Pub.

Todaro, M. P. and Smith, S. C. [2009], "*Economic Development*", Pearson education limited.

Torsvik, G. [2000], "Social capital and economic development: a plea for the mechanism", *Rationality and Society* 12: 451–476.

Trabelsi, M. [2004], "Finance et croissance : évidence empirique des pays en développement 1960- 1990 ", *Économie appliquée,* no.2, P: 171-197.

Williamson, O. [2000], "The New Institutional Economics: Taking Stock, looking Ahead", *Journal of Economic Literature*, vol. 38: 595-613.

Williamson, O. E. [2008], "Outsourcing: Transaction Cost Economics and Supply Chain Management", *Journal of Supply Chain* Management, vol. 44: 5-16.

Whiteley, P.F. [2000], "Economic growth and social capital", *Political Studies* 48: 443– 466.

Woolcock, M. [1998], "Social Capital and Economic Development: Toward a Theoretical Synthesis and Policy Framework", *Theory and Society*, vol. 27, no.2:151–208.

World Bank [1998], "The initiative on defining, monitoring and measuring social capital", *Working* Paper, no.2.

World Bank, [2011], "What is Social Capital?"

http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/E XTTSOCIALCAPITAL/0,,contentMDK:20185164~menuPK:418217~pagePK:148956~piPK: 216618~theSitePK:401015,00.html

Wurgler, J. [2000], "Financial Markets and the allocation of capital",Journal *of Financial Economics* 58:187-217.

Zak, P.J., and S. Knack. [2001], "Trust and growth", *Economic Journal* 111: 295–321.

Appendices

A. List of countries by categories:

A.1 List of countries with different levels of institutional quality environment

List of countries with high control of corruption		List of countries with medium and low control of corruption			
Code	Name	Code	Name	Code	Name
AUS	Australia	ALB	Albania	MYS	Malaysia
AUT	Austria	DZA	Algeria	MLI	Mali
BEL	Belgium	ARG	Argentina	MEX	Mexico
CAN	Canada	ARM	Armenia	MDA	Moldova
CHL	Chile	AZE	Azerbaijan	MAR	Morocco
CYP	Cyprus	BGD	Bangladesh	NGA	Nigeria
DNK	Denmark	BLR	Belarus	PAK	Pakistan
EST	Estonia	BIH	Bosnia and Herzegovina	PER	Peru
FRA	France	BRA	Brazil	PHL	Philippines
GER	Germany	BGR	Bulgaria	POL	Poland
HKG	Hong Kong	CHN	China	PRI	Puerto Rico
ISL	Iceland	COL	Colombia	ROM	Romania
IRL	Ireland	HRV	Croatia	RUS	Russia
JPN	Japan	CZE	Czech Republic	RWA	Rwanda
MLT	Malta	DOM	Dominican Republic	SAU	Saudi Arabia
NLD	Netherlands	EGY	Egypt	SRB	Serbia
NZL	New Zealand	SLV	El Salvador	SVK	Slovak Republic
NOR	Norway	ETH	Ethiopia	ZAF	South Africa
PRT	Portugal	FIN	Finland	TZA	Tanzania
SGP	Singapore	GEO	Georgia	THA	Thailand
SVN	Slovenia	GHA	Ghana	TUR	Turkey
ESP	Spain	GRC	Greece	UGA	Uganda
SWE	Sweden	HUN	Hungary	UKR	Ukraine
CHE	Switzerland	IND	India	VEN	Venezuela
GBR	United Kingdom	IDN	Indonesia	VNM	Vietnam
USA	United States	IRN	Iran	ZMB	Zambia
URY	Uruguay	ITA	Italy	ZWE	Zimbabwe
		KGZ	Kyrgyzstan		
		LVA	Latvia		
		LTU	Lithuania		
		MKD	Macedonia		

Note: to classify these two groups of countries we used the World Bank indicator of governance measured by control of corruption index defined by "the degree to which corruption is perceived to exist among businesses, public officials and politicians". Countries with ranking above 50th percentile are considered strong institutional environment with high control of corruption, and countries with ranking lower than 50th percentile specify weak institutional environment and with medium and low control of corruption
Source: World Bank Database and author's calculation.

A.2 List of developed and developing countries

Developed countries		Developing countries			
Code	Name	Code	Name	Code	Name
AUS	Australia	ALB	Albania	NGA	Nigeria
AUT	Austria	DZA	Algeria	PAK	Pakistan
BEL	Belgium	ARG	Argentina	PER	Peru
CAN	Canada	ARM	Armenia	PHL	Philippines
CYP	Cyprus	AZE	Azerbaijan	POL	Poland
CZE	Czech Republic	BGD	Bangladesh	PRI	Puerto Rico
DNK	Denmark	BLR	Belarus	ROM	Romania
EST	Estonia	BIH	Bosnia and Herzegovina	RUS	Russia
FIN	Finland	BRA	Brazil	RWA	Rwanda
FRA	France	BGR	Bulgaria	SAU	Saudi Arabia
GER	Germany	CHL	Chile	SRB	Serbia
GRC	Greece	CHN	China	SGP	Singapore
ISL	Iceland	COL	Colombia	ZAF	South Africa
IRL	Ireland	HRV	Croatia	TZA	Tanzania
ITA	Italy	DOM	Dominican Republic	THA	Thailand
JPN	Japan	EGY	Egypt	TUR	Turkey
MLT	Malta	SLV	El Salvador	UGA	Uganda
NLD	Netherlands	ETH	Ethiopia	UKR	Ukraine
NZL	New Zealand	GEO	Georgia	URY	Uruguay
NOR	Norway	GHA	Ghana	VEN	Venezuela
PRT	Portugal	HKG	Hong Kong	VNM	Vietnam
SVK	Slovak Republic	HUN	Hungary	ZMB	Zambia
SVN	Slovenia	IND	India	ZWE	Zimbabwe
ESP	Spain	IDN	Indonesia		
SWE	Sweden	IRN	Iran		
CHE	Switzerland	KGZ	Kyrgyzstan		
GBR	United Kingdom	LVA	Latvia		
USA	United States	LTU	Lithuania		
		MKD	Macedonia		
		MYS	Malaysia		
		MLI	Mali		
		MEX	Mexico		
		MDA	Moldova		
		MAR	Morocco		

Note: The IMF uses the following criteria to classify the list of developed and developing countries. This classification system is based on: (1) the per capita income level, (2) the export diversification and (3) the degree of integration into the global financial system. The World Bank classifies countries according to their level of GNI (gross national Income) per capita.
Source: The International Monetary Fund's World Economic Outlook Report, April 2012 and World Bank data.

B. Data sources:

Variables	Description	Sources	Link Website
G_Y	Real GDP per capita growth rate	Penn World Table [2010]	https://pwt.sas.upenn.edu/php_site/pwt70/pwt70_form.php
Trust	Percentage of people trust each other in the country	World Value Survey	http://www.wvsevsdb.com/wvs/WVSData.jsp
HK	Average secondary school enrollment (% gross)	World Development Indicators	http://data.worldbank.org/data-catalog/world-development-indicators
IY	Average gross capital formation to GDP ratio	World Development Indicators	http://data.worldbank.org/data-catalog/world-development-indicators
FD	Average ratio of liquid liabilities to GDP	World Bank	http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20696167~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html
IQ	Institutional quality	Kaufmann et al. [2010]	http://www.nsd.uib.no/macrodataguide/set.html?id=50&sub=1

C. Econometric appendix

C.1. Seemingly unrelated regressions model

In chapter 2 we propose to use seemingly unrelated regressions model to estimate the following system of equations:

$$\begin{cases} G_y^i = \alpha_0 + \alpha_1 ln(Y_0^i) + \alpha_2 Trust^i + \theta TC^i + \varepsilon^i, \\ TC_j^i = \beta_{0,j} + \beta_{1,j} Trust^i + \mu_j^i, \end{cases}$$

where G_y^i refers to the average growth rate of real GDP per capita, Y_0 refers to the initial real GDP per capita, $Trust$ is the social capital indicator, measured by "*the percentage of people trust each other in the country*". Also, TC means the vector of other explanatory variables that include human capital, measured by the average years of secondary schooling HK, the average gross capital formation to GDP ratio IY, financial development, measured by the average ratio of liquid liabilities to GDP FD, the institutional quality environment IQ are introduced in the estimated equation.

The $\theta = (\alpha_3, \alpha_4, \alpha_5, \alpha_6)$ − the vector of estimated parameters by explanatory variable describing the different transmission channels, HK, IY, IQ, FD, respectively.

α_0 − is the estimated constant term and α_1, α_2 are the estimated coefficient by the initial real GDP per capital, and trust indicator, respectively.

In the second equation $\beta_{0,j}$ and $\beta_{1,j}$ are the vectors of estimated value of the constant term and trust indicator for each of the transmission channel. ε^i and μ_j^i are the error term[51], where j varies from 1 to 4. Although the error terms are serially uncorrelated (i.e. the error terms for different observations are uncorrelated), unlike in standard simultaneous multi- equation models, the error terms in subsequent equations can be dependent. The vector of error terms $(\varepsilon^i, \mu_1^i, \mu_2^i, \mu_3^i, \mu_4^i)$ is normally distributed with mean vector 0 and correlation matrix Σ, $N(0, \Sigma)$.

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[51] The error terms in the subsequent regressions are dependent.

The set of equation of the estimated system can be written as:

$$\begin{cases} G_y^i = \alpha_0 + \alpha_1 ln(Y_0^i) + \alpha_2 Trust^i + \alpha_3 HK^i + \alpha_4 IY^i + \alpha_5 IQ^i + \alpha_6 FD^i + \varepsilon^i, \\ HK^i = \beta_0^{HK} + \beta_1^{HK} Trust^i + \mu_1^i, \\ IY^i = \beta_0^{IY} + \beta_1^{IY} Trust^i + \mu_2^i, \\ IQ^i = \beta_0^{IQ} + \beta_1^{IQ} Trust^i + \mu_3^i, \\ FD^i = \beta_0^{FD} + \beta_1^{FD} Trust^i + \mu_4^i, \end{cases}$$

C.2. Dynamic panel GMM system model

During the recent decade the GMM (Generalized Method of Moments) dynamic panel methodology has drawn a lot of attention after the publication of Arellano and Bond [1991], Arellano and Bover [1995], Bond and Blundell [1998].

The representation of the model is as follow:

$$Y_t^i - Y_{t-1}^i = \alpha Y_0^i + \beta' X_t^i + \gamma Z_t^i + \mu_i + \varepsilon_t^i,$$

where $Y_t^i -$ refers to the logarithm of the annual real GDP per capita in country i in year t, Y_0^i is the initial real GDP per capita, X_t^i is a set of explanatory variables, including the ratio of investment to GDP INV_t^i, the population growth rate POP_t^i, and the liquid liabilities to GDP LLY_t^i, Z_t^i is the interaction variables between the financial development indicator and either the trust index as proxy of the social capital indicator $Trust_t^i$ or the general institutional environment quality index IQ_t^i. μ_i captures unobserved country-specific effects, and ε_t^i is an error term.

In chapter three we used the method presented in the paper of Arellano and Bond [1991] and Blundell and Bond [1998] using the generalized method of moments for dynamic panel. The use of the GMM dynamic panel model has the advantage to remove the issue of

simultaneity and endogeneity bias that can result from estimation of dynamic equation. As instrumental variable in the estimation I have used lagged values of independent variables. To verify the hypothesis of non-correlation of the error terms and the validity of instrument I used the difference Sargan test and lagged differences of the explanatory variables as instrument.

It is worth mentioning that such methodology has many advantages and benefits, start from the utilization of panel data to the choice of instrumental variables. In fact, the first point to highlight is that the use of panel data to analyze the relation between financial development and long term economic growth can provide us with more consistent results by taking into account not only the individual dimensions between countries but also by allowing us to analyze the evolution of the above relation over time and within countries, such techniques can increase the variability of the data used and the degree of freedom. The second point is that unlike cross-sectional analysis, the use of panel estimates can take into account the country specific effects and therefore reduce bias of the estimated coefficient.

The third point refers to the problem of correlation between the error term and the explanatory variable introduced in the model. In fact, in an autoregressive model, all traditional estimators may be inconsistent, what requires the use of other econometric method like the instrumental variable method proposed by Anderson and Hsiao [1982]. However, sometime the use of such methodology may have some weaknesses because it does not take into account all the moment conditions. Also, in practice it may give quite unsatisfactory result and outlier values. Therefore, the use of the generalized moment method on dynamic panel proposed by Arellano and Bond [1991] and Blundell and Bond [1998] is considered a solution to resolve all these problems especially the problem of endogeneity of all the explanatory variables introduced in the model like in our case the financial development indicator, the capital accumulation, population growth rate and others.

C.3. Logistic regression

The logistic model used in chapter four considers the case where the response y_{it} is binary and takes only two values with code one or zero. For example:

$$y_{it} = \begin{cases} 1, & \text{if banking crisis happen at the moment t in the country i,} \\ 0, & \text{otherwise.} \end{cases}$$

We view y_{it} as a realization of a random variable Y ($DummyCrisis$), that can take the values one with probability π_{it} and zero with probability $1 - \pi_{it}$. Thus Y has the Bernoulli distribution with the probability π_{it}.

$$Pr(Y_{it} = y_{it}) = \pi_{it}^{y_{it}}(1 - \pi_{it})^{1-y_{it}},$$

Assuming we have observations from I countries for T moments. The joint probability function of a random sample $y = (y_{1,1}, y_{2,1}, y_{3,1}, \ldots \ldots \ldots \ldots \ldots y_{I,T})$ is then:

$$P(y|\pi_{1,1}, \ldots \ldots \pi_{I,T}) = \prod_{\substack{i=1,\ldots I \\ t=1,\ldots T}} P(Y_{i,t} = y_{it}) = \prod_{\substack{i=1,\ldots I \\ t=1,\ldots T}} \pi_{it}^{y_{it}}(1 - \pi_{it})^{1-y_{it}},$$

We assume that the probabilities π_{it} depend on some set explanatory variables X_{it}:

$$\pi_{it} = f(\beta'X_{it}),$$

where $f(.)$ is increasing function of variables taking values between 0 and 1. β is the vector of coefficients that captures the effects of the independent variable on the probability of crisis. X_{it} refers to the set of explanatory variables introduced in the model including: the real GDP per capita, $RGDP$, the real interest rate, $Rrate$, the inflation rate, Inf, the ratio of total debt service to export, $Debt$, and the ratio of loans to the private sector relative to GDP, $CSPY$. In the list of explanatory variables we also added other qualitative indicators like the quality of

institutional environment, as computed by Kaufman, Kraay and Zoido-Lobatón [2010], IQ, the liberalization dummy variable, $Dummy\_Intlib$, and the measure of social capital collected from the World Value Survey Database, $Trust$.

The sign of the coefficient indicates the positive or the negative impact of the explanatory variables while the magnitude depends on the slope of the function f and the value of $\beta' X_{it}$.

In the logit model we assume that f is the logistic function:

$$f(x) = \frac{e^x}{1+e^x}.$$

The log likelihood can be calculated using the following formula:

$$lnL = \sum_i \sum_t \{y_{it} ln[f(\beta' X_{it})] + (1 - y_{it})ln[1 - f(\beta' X_{it})]\}.$$

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