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Cooperation, Social Capital and Economic Performance

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The objective of this paper is to define social capital as social infrastructure and to try to include this variable in an economic growth model. Considering social capital in such a way could have an impact on the productivity of production factors. Firstly, I will discuss how institutional variables can affect growth. Secondly, after analyzing several definitions of social capital, I will point out the benefits and problems of each one and will define social capital as social infrastructure, aiming to introduce this variable into an economic growth model. Finally, I will try to open the way for subsequent empirical studies, both in the area of measuring the stock of social infrastructure as well as those comparing economies, with the idea of showing the impact of social infrastructure on economic growth.

Key-words: social capital, economic development, institutions, ethics
JEL classification: A13, O10, Z13.

INTRODUCTION

This article is part of a research agenda covering institutions and growth. The first aim of this paper is to define social infrastructure, by distinguishing it from the broader concept of social capital and try to show how, in subsequent work, such a concept may be included in analytical models of economic growth. I shall also try to speculate on the type of proxies, which might be used to measure it.[1]

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[1] I am going to argue that we must abandon the metaphoric conception of "capital" associated with the social capital definition. As Arrow (1999: 4) justifies: "(…) I would urge abandonment of the metaphor of capital and the term 'social capital'. The term capital implies three aspects: (a) extension in time; (b) deliberate sacrifice in the present for future benefit; and (c) alienability". Social capital does not have these characteristics. As extensive survey about this subject and about the uses (and abuses) of the concept of social capital can be found at Dasgupta & Serageldin (1999).

Nevertheless, I shall argue throughout the article that the use of the concept of social capital is perhaps more suitable in the context of studies on economic and social development and, methodologically speaking, in case studies, for evaluating local development experiences.

Finally, I intend to open the way for subsequent empirical studies, both in the field of measuring the stock of social infrastructure, as well as in cross-section studies among economies, with the idea of gauging the impact of social capital on economic growth.

What are the justifications for such speculation?

First of all, this article is fully justified by the fact that in the literature on economics there is no adequate definition of the concept of social capital and neither there are models, which deal in a clear and coherent way with the relationship between social capital and economic performance in general. As the first part of the article will show, a broad-ranging and extensive examination of the literature on this theme reveals a huge diversity of definitions of what is social capital and the possible ways of "modeling" this concept. My future aim, as I summarize the relevant literature on this subject, will be to build a social capital accumulation model, which comprises the fundamental characteristics that appear in the other modeling proposals.

Secondly, this article is also justified by the fact that it is on the cutting edge of knowledge in an emerging research area on economics and on the theory of organizations (see more about this research agenda in the management of public and governmental organizations, Casson, 1991). I believe that from the economic theory point of view as well as from the point of view of the theory of organizations, the "social capital" topic is appearing increasingly in research agendas, with the idea of furnishing significant practical results, not only for government policies, but also for governance structures within companies and organizations in general.

Finally, from the practical point of view, this type of investigation can be justified by the economic and social importance of the topic. As Hall and Jones (1998) noted, with convincing empirical data, cross-country differences about capital accumulation and about the increase in productivity and product per worker are strongly associated with institutions and the social infra-structure as well as with public policies.[2]

From various aspects, economies differ in terms of growth rates, levels of per capita income, and levels of human and social development. Any cross-section or panel study whatsoever tends to highlight these differences (see Silva, 1997

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[2] The amount of literature, which tries to integrate institutional variables to the study of growth from the quantitative and qualitative point of view, is huge. However, we can find some of the basic references in the following works: Bardhan (1997), Barros (1997), Baumol (1993), Borner,Brunetti & Weder (1992),Burki, Perry et al. (1998), Campos & Nugent (1998), Fukuyama (1995), Hall & Jones (1998), Helliwell (1994), Inkeles & Sirowy (1991), Kapur (1997), Keefer & Knack (1997a, 1997b, 2000), Lebalng (1997), Mankiw, Romer &Weil (1992), Mattews (1986), Mbaku (1997), Murphy, North (1981, 1990,1994), Przeworski & Limongi (1993), Shleifer & Vishny (1991), Silva (1996,1997,1998a).

and Silva, 1998). For example, as Hall & Jones (1998, p.1) point out, in 1998 the per capita income in the USA was 35 times greater than the per capita income in Nigeria:

"In just over ten days, the average worker in the United States produced as much as an average worker in Nigeria produced in an entire year".

We can state however that economies in general differ radically in terms of their economic performance. The idea of performance takes into consideration two dimensions of the economic phenomenon, i.e. economic efficiency and growth (see North, 1990). It is notable how much economic performance, both from a static and dynamic point of view, varies between countries. The inclusion of other indicators in the economic analysis, such as crime, violence, political and institutional stability and corruption, associated with measures of human development, tends to indicate that at least in principle, there is some relationship between non-economic and economic factors, such as efficiency and growth, which represent the two dimensions of economic performance, static and dynamic.

Analyses based on the aggregated production function, such as those carried out by Mankiw, Romer & Weil (1992) tend to show that, in fact, there is a great diversity of factors, which explain the differences in performance among countries.[3] In general, these studies indicate that differences between rates of growth can be associated with different stocks of physical and human capital and with different levels of productivity. However, the questions, which are rarely posed, are: Why do different countries invest more or less in physical and human capital and in new technologies? What can explain these differences? Why, at the end of the day, is Nigeria markedly less productive than the USA?

Perhaps one of the possible explanations lies in the fact that institutions in certain economies do not create adequate systems for encouraging the accumulation of physical and human capital. Variables such as democracy, the guarantee of rights in general, corruption and liberty, for example, show that, at least empirically, there is some relationship between them and these differences in terms of economic performance.

Apparently democracy, as far as rich countries are concerned, is principally related to higher rates of domestic saving and therefore investment. This phenomenon can be explained in various analytical and empirical ways, using causality studies, panels, etc. but one of the explanations might be the relationship between the guarantee of rights in general and incentive for accumulating capital.

It is also possible to show the possible relationship between democracy and the wealth of countries. It is clear that we cannot escape from the "tragedy of social data", or in other words "bad things all turn up at the same time". But, once again, these apparently trivial facts have to induce the researcher to undertake analytical and empirical studies, which try to provide explanations and establish functional relationships between these variables in such a way as to discover whether there is any strong empirical evidence, which might support an argument.

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[3] See Hall & Jones, 1998, p. 1-2.

An important observation has to be made at this point. All measures of liberty and democracy involve a certain degree of arbitrariness. Data from *Freedom House*, for example, measure democracy by what is called the "degree of democracy", which is nothing more than a weighted average of various indicators of freedom of expression (the press), respect for human rights, guarantee of access to certain basic public goods, intensity of legal sanction to certain crimes, among other things.[4]

The notion of democracy we have used here is close to the notion of democracy as freedom, but freedom in the instrumental sense of the word, i.e., which involves no specific value judgment, but only a consequentialist judgment in accordance with one end.[5]

Therefore, as far as this work is concerned, I shall analyze the role of institutions from this point of view, and shall not deviate in any normative way to discuss their role. The questions involving the relationships between institutions in general and economic performance will be looked at from this perspective.[6]

My basic hypothesis is that such questions can be answered by considering the cross-country differences between social infrastructures, or more precisely, between stocks of social capital. Baumol (1990), Murphy, Shleifer & Vishny (1991) and Mbaku (1997), among others, noted that institutions and social infrastructure have a strong connection with economic performance. Institutions are like social technologies, which can create an institutional and social environment that is favorable to those economic activities.

However, traditional economic theory considers the differences between the economic performances of various economies as the result of a phenomenon, which are characterized by broadly, stylized empirical facts. The neoclassical growth model, for example, emphasizes the role played in growth by capital accumulation and technological change (see Silva, 1998a). Even endogenous models, which generally have less empirical adherence than the neoclassical model itself, do not explicitly consider institutional technology as a relevant variable when it comes to explaining cross-country differences in economic performance.

Van Dijk (1997) observes that fundamental questions, associated with the phenomenon of growth, such as the roles of social infrastructure and economic organization, are put to one side in traditional explanations. Van Dijk (1997, p.

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[4] All social and institutional indicators have limitations. They are normally associated with multicolinearity between the social variables. For this reason it is necessary to underline that this quantitative notion of democracy puts on one side qualitative aspects such as those associated with governance and accountability.

[5] For more information on this vision of democracy and liberty, see Sen (1999).

[6] Among the different and divergent positions on democracy and social contract, the following are worthy of note, Rawls (1971), Nozick (1974), Downs (1957) and Dahl (1986). It should be noted that in this work the problem of institutions — and democracy and the social contract, in particular — is not discussed from the normative or the political point of view, or within the limits of political philosophy and the theory of justice. However, and this point needs emphasizing, such a discussion, even though it is outside the scope of this essay, is fundamental principally when the qualitative dimension of economic growth is being discussed.

1) notes that in general the way in which business is actually conducted within the economy is not important to the majority of economic models. But the way in which business is organized, how agents relate one to another, how industrial property is constituted, how incentive structures affect economic action, are in fact relevant variables when we consider a broader understanding of the economic phenomenon in general and economic performance, in particular.

Nevertheless, the construction of such an argument depends on analytical models, which manage to include, from the logical and formal point of view, such institutional variables in an economic model in the strict sense of the word and on the empirical "testability" of these models. This article argues that, despite the fact that it is very attractive the idea of include institutional variables in economic models, whatever they may be, there are a series of theoretical and empirical difficulties which arise when dealing with proxy variables, which might be used to represent parameters as like as social capital. This is a basic argument, which this small critical survey will try to defend.

WHAT IS THE IMPORTANCE OF INSTITUTIONS TO ECONOMIC ANALYSIS?

From the middle to the end of the 90s, very probably as a result of the relative failure of the reform agenda of the World Bank for Latin America and Eastern Europe, there was a growing preoccupation with this theme, both in academic circles as well as in international organizations like the World Bank itself and the IMF (see Silva, 1997, and World Bank, 1997).

For example, it is increasingly common in studies like those of Borner, Brunetti and Weder (1992) to note a strong empirical relationship between institutional stability, institutions and economic growth. More recent work, notably that of Van Dijk (1997), Hall & Jones (1998) and Routledge & Amsberg (1996) tends to point in the same direction.[7]

These papers observe that social infrastructure, as defined in terms of the business institutions present in an economy, compliance with contracts, institutional stability, etc. is a variable, which can explain the cross-country difference in economic growth. Nevertheless, these two articles offer no acceptable economic explanation about what in fact social infrastructure is, including mechanisms for cooperation and social capital.

We shall see later that I try to provide a more precise explanation of these concepts and I speculate upon what are really the possible links between them and the economic phenomena, which are relevant for growth theory, and upon something more important, namely economic development.

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[7] The two latter works quoted are the most important in this area since both deal empirically and theoretically with the fundamental question behind this article, which is the relationship between social capital and economic performance.

Following a less analytical, more historical and rhetorical tradition, North (1990) and Fonseca (1994) observe that human cooperation (and therefore the institutions which give rise to it), accompanied by a minimum of moral responsibility, can be fundamental when it comes to explaining difference in terms of economic performance.

North (idem) in particular, considers that institutional evolution can lead an economy into a pattern of virtuous dependence. As Van Dijk (1997), Sen (1987) and Kapur (1997) note, there may be a relationship between moral values, cooperation and growth, to a certain extent, as the Asian experience tends to show. Nevertheless, any speculation about the relationship between values, ethics, cooperation and economic performance must be based on strict adherence to theory, through the construction of models, in such a way as to avoid "formal moralisms", as apparently is the case of Fukuyama (1995).

For example, we might intuitively suppose that in fact some kinds of public policy, to the extent they favor the appearance of cooperation and the formation of social capital, might, in a Paretian sense, improve economic performance and create conditions for a more efficient economic development (see, about this, a very interesting experiment in Tanzania, in World Bank, 1997). In certain circumstances, for example, the local and cooperative production of public goods may be more efficient than "state" production, thereby increasing the rate of social return of some of the investments, which are fundamental for development. However we need greater precision in the use of concepts and analytical formulas, which, within the literature on this subject, are not appropriately constructed.

As Van Dijk (1997, p. 3) observes, there are two types of research agenda, which can be associated with the study of the relationship between social infrastructure and economic performance. The new institutionalism, as expounded by North, for example, pays more attention to institutions, which are defined as social technologies, created either intentionally or not, by men and women of bones and blood (North, 1990). This literature and the tradition of public choice and constitutional economics lay emphasis on the rules, both in the market, in the literal sense of the word, and in the political market (for more information, see Silva, 1998b). The other research current, as Van Dijk (idem) notes, is linked to a tradition, which considers economic behavior as an action buried under the fabric of society, the complex of human relationships and social networks.

As far as the first vision is concerned, the relationship between institutions and efficiency on the one hand and institutions and economic growth on the other can be established as follows.

The world of neo-institutionalism is always behind the first best. Given this fact, in reality, transaction costs are introduced into this world, which are greater than zero, as are incentive structures, which do not necessarily lead the economy to a more efficient *status quo*. In fact, the very notion of efficiency has, to a certain extent, been abandoned by neo-institutionalism and substituted by the notion (vague, by the way) of economic performance.

Within this research program, what are the relationships between institutions

and growth? There are two ways of analyzing the relationship between the institutional apparatus and economic growth.

The first way implies the presupposition that institutions can generate greater or smaller transaction costs. Transaction costs can be translated as the loss of resources, which are economically scarce, including resources for investing in physical and human capital.

The second way presupposes that institutions generate productive or unproductive incentive structures, which might be rent-seeking. In this case, the relationship between institutions and growth arises by means of the allocation of scarce economic resources between productive and unproductive activities. There are numerous examples in literature on this subject, but the most noteworthy are Murphy, Shleifer & Vishny (1991). This paper touches on the relationship between institutions, incentive structures and the allocation of talent, taking into consideration the impact of these variables on economic growth.

However, there is an important epistemological and methodological observation to be made on this vision. Strictly speaking, when we talk about institutions and values we are introducing into traditional economic theory a discussion which, at least in principle, does not belong to it or at least did not up until a very short time ago. It is inevitable — as it is in this article — that there will be speculation about the theories of the formation of endogenous preferences. It is not surprising, therefore, that institutions and values — preferences in economic jargon — are considered exogenous variables, given the difficulty in dealing with these factors endogenously.[8]

If we consider a critical view of the hypothesis of methodological individualism,[9] institutions and the social environment cannot be considered exogenous, but as something which is created by the very interaction between agents. On the one hand we cannot take the preferences literally; on the other hand we cannot abandon the methodological individualism, since preferences and values as well as institutions are the result of the interaction between individuals.

It is usual to say that economics has the correct method (methodological individualism) but the wrong questions (the formation of preferences is not studied), and that sociology have the wrong method and the right questions. Up to a certain point, there is a lot of truth in this. The institutional and social environment, which restricts economic behavior, is an important variable to explain the differences in economic performance. However there is a trade off implicit in this tacit acceptance, which is that preferences need to be endogenized even if we lose the ability to construct models or general theories.[10]

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[8] Despite the fact that the objective of this article is to speculate on how the social environment, represented by one of its aspects, social capital, affects economic performance, I shall not be able to undertake a deep epistemological analysis here of the limits and frontiers between economics and sociology.

[9] On this concept, see Silva, 1994.

In this article I shall limit myself to an analysis of how to include the concept of social capital within a growth model, taking as a starting point the first vision, even though I recognize that elements of what would be the second form of analysis of the relationship between institutions might be relevant to the subject. This vision was called "Social Economics" by Schumpeter (see Silva 1998). This is the vision that Swedberg (1990, pp 3-29) considers fundamental to the formulation of an all-embracing economic theory.

WHAT IS SOCIAL CAPITAL?

Social capital and social infra-structure are concepts, which, as far as is possible should be differentiated. Both include social and institutional factors, which are generally considered exogenous variables in traditional economic analysis. For example, not only in endogenous growth models, but also in neoclassical ones, the concepts of physical capital and human capital do not include these institutional and social dimensions.

The ideal is to seek a definition of social capital, which is both clear and broad-ranging, as well as being capable of being measured. To do this we need to see what are the advantages and disadvantages of series of definitions. In this respect, it should be noted that there are basically three series of definitions of social capital, as pointed out by Van Dijk (1997, p. 4).

Firstly, social capital can be defined as a set of relationships and social networks which an agent — an individual — has and all the resources, which she/he can muster in the market-place using such relationships. This type of definition is proposed by Bourdieu (1980). Social capital can be seen therefore as the expected present value of future support. A further way of considering this vision[11] of social capital is to define it in terms of the expectations and obligations between individual agents; this lead to the approximation of the concept to the idea of *confidence* (see Coleman, 1990, and Fukuyama, 1995).

This set of definitions and visions of social capital implies that, when it comes to analyzing economic growth, we have to consider how stocks of this capital affect transaction costs in the economy as well as their impact on the investment in human and physical capital. If we consider the vision of Bourdieu and Coleman,

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[10] It is important to underline an fundamental methodological question related to the question of the endogenization of preferences. It is not at all reasonable to suppose that scientific work can be reduced to the building of models, when this activity becomes an end in itself. This vision of scientific work is almost Parnassian. Analytical work becomes simpler if we can rely on analytical structures, which can be placed in the model form. But this is not always possible and it's not for this reason that we are simply obliged to ignore phenomena, which "cannot be placed in mathematical models". This is precisely the case of ideology, of belief systems, of their formulation and alteration, something that cannot be ignored in social science in general and in economics in particular.

[11] It is important to note that the term "vision" is intentionally used here in the Schumpeterian sense of the word. See Silva, 1998b.

social capital involves every sort of horizontal relationship which is established, either tacitly or explicitly, between individuals and groups of individuals with the aim of creating relatively stable economic relationships, which are underpinned by some type of mutual confidence and respect for a certain set of rules.

To a certain extent, confidence, and the rules, which guarantee it, represent privately produced public goods in a world where the conditions of the Coase Theorem prevails. In this case, laws and norms are the public goods.

This definition has the advantage of indirectly associating the notion of social capital with cooperation. However, there are collective actions underpinned by confidence and sometimes restricted by repressive rules (for example, criminal gangs), whose economic impact in terms of efficiency and economic performance is ambiguous. Rent-seeking groups, for example, can organize themselves to prevent constitutional reforms, which would guarantee greater economic efficiency and even distributive justice (regardless of what definition of distributive justice is used).

Furthermore, clientelist economic structures and those where there are cartels may have their origins in cooperative actions and therefore may be the product of the existence of social capital in society. It is obvious in this case that, from the economic point of view, cooperation has a bad economic effect.

In second place, social capital can be defined, within the tradition of constitutional economics and public choice, as the stock of rules and laws (presupposing there is the sanction — enforcement — of the law). This vision of social capital, as established by Buchanan (1975), considers norms (informal laws) and rules (including laws and constitutions, etc.) as elements, the stock that defines this concept of capital. North (1990, 1994) and Ostrom (1994) have a similar vision.[12]

The great advantage of this vision, obviously contractionist/constitutionalist, is that it defines social capital as the minimum of necessary altruism, using the Smith vision, for the reasonable functioning of an economy driven by the market, i.e. by the so-called private vices.

From my point of view, to define social capital in this way allows us not only to escape from the traps associated with the first set of definitions, as well as opening the way for measuring the possible efficiency of a particular stock of norms and laws. This can be done, for example, by constructing proxies for the sanction of the law, such as the number of broken contracts, the speed with which cases are brought to justice, etc.

The problem with this second definition is that there may be sets of rules, which are more or less efficient. This greater or lesser efficiency would be evaluated in accordance with the capacity, associated with a given set of rules, to lead the economy towards or away from the first best *status quo* position. Perhaps therefore it becomes impossible to define and organize different legal and normative systems.

Thirdly, social capital, within the theory of organizations, can be simply

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[12] In fact, it is noticeable that there is a common *Weltanschauung* between the constitutional economy and the new institutionalism, associated with the Austrian origins of both research programs. See Silva, 1998a, pp. 43-4.

defined as organization. Coleman (1990) suggests this possible interpretation and definition, which includes both organizations which appear in a Coasian environment, such as in the *club theory,* for the voluntary production of public goods, as well as private companies in general, or non-governmental organizations, civil entities and foundations. Obviously, such a vision of social capital considers that organizations have ways to overcoming the problem of collective action, as suggested by Olson (1995). The virtue of such a vision, within the theory of transaction costs, is that it considers social capital as a mean of reducing transaction costs in the economy.

Finally, there are definitions of social capital, which tend to bring together various different elements of the sets of definitions mentioned above. Putnam (1995, 1993) defines social capital as something which refers to the characteristics of social organization, such as confidence and the norms and networks which may improve the economic efficiency and functioning of democracy due to the fact that they encourage coordinated, collective and cooperative actions.

Finally, in literature there is certain identification between the concepts of social infra-structure and social capital (see van Dijk, 1997, p. 5). However, as was pointed out above, one of the aims of this paper is precisely to look for a broad and measurable definition of social capital. I am going to do it using social capital defined as like as social infra-structure. As Van Dijk (1997, p. 5-6) points out:

> "It follows from these interpretations that social capital and infra-structure are diffuse concepts, and are often used in a metaphorical sense rather than as precise, mensurable variables (...). The different interpretations lead to a number of issues. It is not clear whether — and how — these interpretations are interrelated, or in the case of Putnam, whether or not incomparable objects are jointed together. In the first meaning social capital is an attribute of the individual, but in the second a characteristic of society. For the level of society, social capital and infras-tructure seem to merge. The first approach which deals with social networks of individuals is the most concrete, and offers the possibility to define social capital as a precise concept".

On the other hand there is no consensus within literature on the impact of social capital on economic efficiency and growth (see the most recent literature on this topic, such as Campos & Nugent, 1998, Hall & Jones, 1998, Hayami, 1997, chapter 9 and Routledge & Amsberg, 1996). In general, there is in fact consensus over the fact that social capital is positively related to the accumulation of physical and human capital and with technological advance. Nevertheless, the models and even the visions implicit in each theoretical set are extremely different.

The concept of social capital is ambiguous.[13] Why use the term "capital" for this concept, which refers to notions, which cover everything from horizontal

[13] See Arrow (Idem).

cooperative relationships to social infra-structure? To define social capital as social infra-structure or the set of rules, laws, and norms, is perhaps the most interesting way of dealing with this economic vision, which is undoubtedly important.

In saying this I am not suggesting that the alternative visions of social capital are worthless. On the contrary, when it comes to case studies, perhaps applying such concepts to local development experiences is really fundamental (I believe so). Nevertheless, capital, at least in economics, is a production factor and has a very restricted and clearly defined meaning which does not fit in with the intuitions and concepts implicit in the traditional concepts of social capital.

THE ECONOMY

The objective here is to show that there is a relationship between social capital, taken as social infra-structure, and growth. Social infrastructure involves a set of institutions such as laws, justice itself and the enforcement of laws and rules, which can reduce transaction costs and uncertainty within the economy.

In this study, the inclusion of such a variable within an economic model is made in the neoclassical growth model, or the Solow's model. I am going to suppose a closed economy. Domestic savings governs the accumulation of capital: technological progress is exogenous and, *coeteris paribus*, represents the only mean of changing the steady state. By introducing social infra-structure into the model I shall try to show how social capital defined in this way can be seen as a type of social technology.

The neoclassical model assumes that savings determines growth, since capital accumulation depends on the size of savings *coeteris paribus.* However, as like as classical models (Ricardo and Malthus) the economy will always tend towards a steady state. In the absence of technical progress, the economy will inexorably slip into a steady state.

As in the Solow' model, I shall consider a production function with constant returns of scale and decreasing marginal returns for capital (and therefore for the stock of capital per worker or *per capita*, since I am also assuming that the economically active population is the same as the total population of the country). From this point of view, *per capita* income depends on the stock of capital *per capita*.

The production function in the neoclassical model states that the aggregate product [Y (t)], in any given period of time, is *coeteris paribus* function of the stock of productive factors, capital [K (t)] and labor [L (t)]. In a modified version, product is also considered as a function of knowledge [A (t)]. Distribution assumptions are valid: it is assumed that there are markets of competitive factors and therefore, each factor is remunerated in accordance with its productivity.

As is usual, I specify the production function as a Cobb-Douglas and the product will be a function of capital and labor.

I shall make a fundamental assumption, i.e., social capital affects the

productivity of factors. Labor productivity increases when there is technological innovation (or an accumulation of technical knowledge) or when there is some type of institutional change or change in the social infrastructure, which implies greater productivity. We shall come back to this point later.

We can define the following generic function:

$Y(t) = F(K(t),L(t).A(t)$

Calling it Cobb-Douglas, we have:

$Y(t) = K(t)^{a}.[A(t).L(t)]^{1-a}$ (I)

As this is a common assumption, L and A grow at constant rates, *n* and *g*.

However:

$L(t) = L(0).e^{nt}$ (II)

$A(t) = A(0).e^{nt}$ (III)

Productivity grows at the rate of (n + g).

Given the hypothesis of the neoclassical model, the equation (I) can be redefined in per capita terms:

$y(t) = f[k(t)]^{a}$ (IV)

and

$y(t) = Y(t).[A(t).L(t)]^{-1}$ (V)

$k(t) = K(t).[A(t).L(t)]^{-1}$ (VI)

The function (IV) follows the traditional conditions, which are:

$f(0) = 0, f'[k(t)]>0, f''[k(t)]<0$

$\lim_{k\to 0} f'[k(t)] = \infty$

$\lim_{k\to \infty} f'[k(t)] = 0$

The evolution of capital per unit of labor per worker [k(t)] determines the evolution of the product per worker [y(t)]. Furthermore, as is usual in the neoclassical model, k(t) depends on the savings rate (s) per worker.

The rate of depreciation of capital is equal to δ, where $0< \delta <1$:

$k(t) = s.Y(t) — \delta.K(t)$ (VII)

Differentiating, this equation becomes

$k(t) = s.f[k(t)]-(n+g+\delta).k(t)$ (VIII)

The dynamic of the steady state, therefore, is described in equation (VIII). The rate of variation of the capital per unit of factor per worker is the difference between the current investment per worker and zero net investment. The stock of steady state capital (k*) is determined by the following equation:

$$K^* = \left[\frac{s}{n+g+\delta}\right]^{1/1-\alpha} \quad \text{(IX)}$$

This stock k* increases with the increase in savings per worker and falls with population growth. The path of *k* defines the path of growth of the income per capita of the economy. The *per capita* product tends towards a steady state product (y*), *coeteris paribus.*

Only a change in an exogenous parameter, technical progress, can alter the

steady state product. In these circumstances the technical progress rate *g* determines the growth in income *per capita*. In the absence of technical progress, the *per capita* product grows if *s* (rate of saving per worker) increases, thereby increasing k*.

Rearranging (IX) we can define the product *per capita* in a steady state:

$$\ln\left[\frac{Y(t)}{L(t)}\right] = \ln A(0) + g(t) + \frac{\alpha}{1-\alpha}\ln(n+g+\delta) \qquad (X)$$

This is the general vision of the neoclassical growth model. The question now is how to include social capital, here understood as social/institutional infrastructure, in the model. As we saw at the beginning of this paper there are various visions about what social capital is. As I argued, amongst them the one, which is most useful when it comes to analyzing growth, is the one which allies social capital to the notion of social infra-structure. Such a point of view is justified because we can consider laws, rules and institutions in the strict meaning of the words, as devices, which can reduce transaction costs in general, and risks, other than uncertainties, within the economy.

On the other hand institutions can create incentive systems for investment, such as, for example, in research and development and in productive activities.

In this analysis I shall only deal with the first vision, which is that social infra-structure can reduce transaction costs and increase the productivity of the economy. As we shall see later, we can include this variable in the model in a way, which is analogous to technical advance. Meanwhile the second vision, whilst not examined here, is important.[14]

For example, rent-seeking activity can be found in the creation of trade

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[14] The rent-seeking theory was basically developed by Krueger (1974) and Tullock (1967). According to this vision, economic agents have a basic motivation, which is to maximize their economic well-being, as the traditional theory puts it out. However, this maximization takes place according to a pre-determined set of rules, in accordance with individual preferences and is restricted to an income: this is the nub of the argument. Agents will seek to obtain the greatest possible income, within the rules of economic and social conduct (or out of them). However, this acquisition of income may imply transfers within society, via monopolies and different forms of privilege. The activity linked to the procurement of this income is called rent-seeking. For example, let us consider the case where agents seek income legally. In a determined economy there is a constitutional monopoly for producing a particular good. The traditional theory of imperfect market structures argues that the monopolist will increase his surplus (producer's surplus) at the cost of reducing the well-being of consumers. Society as a whole (including managers, workers and shareholders of the monopoly company) loses a part of its well-being, because in a monopoly situation a certain quantity of the good produced will not be negotiated. Strictly speaking, over and above this dead weight loss, the transfer between consumers and the producer implies a zero net loss.
However there is a net loss for society. The monopoly organization will allocate productive resources to obtaining and maintaining its monopoly. This action involves lobbying, propaganda and the investment of talents in other unproductive activities associated with political pressure and the formation of an image of the company, which is strictly linked to its interest in maintaining the monopoly. On the one hand, there is an opportunity cost associated with this inefficient allocation of resources; finally, there is the long-term impact produced by this allocation.

barriers and protectionism. In this case, traditional microeconomic theory considers social costs in terms of the loss of well-being due to the dead weight loss generated by the protection and notes that there are transfers from consumers to domestic producers. Besides the dead-weight loss there is no net loss to society. But, as in the case of the monopoly, companies that enjoy a reserve of market use financial and human resources in unproductive activities, principally lobbying.

The rent-seeking activity produces a competitive market, i.e., various agents try as far as is possible, to obtain privileges and transfer income from other groups. However, only some of the agents or groups of agents will obtain these privileges; the final result implies a waste of economic resources.

The cost associated with the rent-seeking activity has an important qualitative dimension. A lot of highly talented people are allocated to these unproductive activities, which are extremely lucrative and for this reason transfers of income within society tend to penalize the talents allocated to productive activities. This transfer of income is accompanied, therefore, by a considerable waste of resources and talent: there is a high opportunity cost associated with the rent-seeking activity, principally as far as the capacity for increasing the productivity of the economy is concerned.

The existence of these income transfers generates additional costs. In a competitive economy, production factors tend to be remunerated in accordance with their respective productivities. But a reallocation of income obtained from the rent-seeking activity might reward the power of influence of determined pressure groups. Therefore, in a society divided into competitive factions, which seek to transfer income, the final result of the economic game tends to be negative: the rent-seeking activity costs are greater than the private benefits obtained by some agents or groups.

Agents look for more rent-seeking activities than productive activities because the social capital or social infra-structure (institutions, laws, government rules, moral values/self-imposed rules) produces an incentive system, which determines how economic resources should be allocated. Institutional technology creates pay-offs within individuals and groups take their decisions. These rules can also directly oblige agents to undertake rent-seeking activities.

The important question is how an institutional technology, like a set of institutions, can create an incentive system, which affects economic growth. Shleifer & Vishny (1993) consider that there is a relationship between institutions, rent-seeking (and corruption, in particular) and economic growth.[15]

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[15] An important observation needs to be made about rent-seeking visions and on the relationship of this phenomenon with economic performance. The Public Choice or Constitutional Economy tradition, associated mainly with James Buchanan, tends to define the political process as essentially based on rent-seeking. Politics is an unproductive activity par excellence because it is an activity where the ultimate objective is the transfer of income. This "economistic" vision of the political process has been strongly attacked by political scientists and economists (see Kuttner, 1997, and Przeworski, 1987).
I support there is a serious misunderstanding in this debate. If we define political activity as a service,

In economic terms, the greatest impact of the rent-seeking activity, whether it is legal or illegal (crime/corruption) is its cost as far as growth is concerned. Rent-seeking activities in general create transfers, which contrary to taxes, involve considerable distortions and the allocation of resources to activities which do not translate into productive investment, into investment in education or investment in research and development. So, if we only consider the Solow' model, we can speculate that a given set of institutions, by providing incentives for unproductive activities, would have an impact on the rate of technical advance and, on decisions about saving and investment. The result of generalized rent-seeking created by any institutional infra-structure can lead to a reduction in economic productivity.

We might therefore speculate about what would be the influence of the institutional infra-structure on the *per capita* product and on economic factors of productivity.[16] In accordance with the above vision, institutions might affect the productivity of the physical capital and work.

Let us consider capital, for example. The social infrastructure can represent greater or lesser transaction costs, thereby decreasing or increasing the "efficiency" of the investment. According to Garcia and others (2001) this hypothesis can be defined as the hypothesis of effective capital. Everything happens as if we could adjust the capital to the social infra-structure, which can be quantified by means of the comparative rankings between countries and in accordance with the transaction cost criteria. According to Garcia and others (idem) and Bandeira & Garcia (2002), such a variable can be included in this economy in the following way:

$$Y_t = \left(I_t K_t\right)^a H_t^{\beta} \left(A_t L_t\right)^{1-a-\beta}, a, \beta > 0 \text{ and } a + \beta < 1 \qquad \text{(XI)}$$

Considering an amount of fixed capital, an institutional infrastructure A_t can generate smaller transaction costs in the economy: with a smaller quantity of capital the same quantity of product *per capita* can be produced as in any other

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we should attribute to such an activity the characteristic of an action that adds value to the aggregate product. The question is to know up to what point activities, which produce pure income transfer, can be defined as productive. I understand that rent-seeking activities are unproductive. However, democracy presupposes that a few choose for the majority of the population and that this public choice naturally involves the reallocation of budgetary sums within the economy. So the discussion is what types of public resource allocation system are more or less inefficient.

Another point, which creates confusion, is the misunderstanding about the concept of rent-seeking, which is that politics is a rent-seeking activity with normative judgments on what is — or should be — democracy. This type of confusion appears in Kuttner, for example (1997, pp 333-42). No one, in the Constitutional Economics tradition fails to recognize that the benefits of democracy — immeasurable as far as human rights and rights in general are concerned — far outweigh the rent-seeking "costs", which are inexorably part of it and of any regime. To conclude, as Kuttner does, that in these visions there is the implicit idea of a "market" theory, which is politically anti-democratic — idem, p 333 — is, at the very least, from my point of view, the result of an incorrect reading of this tradition.

[16] For a detailed examination of this topic, see Bandeira & Garcia, 2002.

economy, where the social infra-structure generates more inefficiency. I suppose, this is the most appropriate vision as far as introducing social infra-structure into the model is concerned.

Despite this, there are other possible ways of looking at the same problem and of introducing this institutional variable into the model. For example, social infra-structure can also be defined as a stock, using the concept of social capital as if it is a production factor. Income *per capita* is a function of K and L factors and the stock of human capital (*I*). The function of production can be redefined like a Cobb-Douglas:

$$Y_t = I^{y}{}_t K^{a}{}_t H^{\beta}{}_t \left(A_t L_t\right)^{1-a-\beta}, a, \beta, \gamma > 0 \text{ and } a+\beta+\gamma < 1 \qquad \text{(XII)}$$

The problem with this type of approach is that it becomes difficult to measure the stock of social capital A_t, in addition to the fact that, as was argued in the first part of this paper, the more restricted concept of social infra-structure seems more appropriate for inclusion in a growth model. That is to say, the quality of institutions affects the productivity of production factors.

Finally social infra-structure can also be introduced into the model, presupposing that there is an accumulation of social capital and that this requires effort, in the same way that a savings effort is necessary for the accumulation of physical capital (for more detail, see Bandeira & Garcia, 2002). According to this concept, effort is measured by the abdication of consumption and therefore, by the investment of part of national income in institutional infra-structure. Examples of this type of investment are constitutional reforms in general, including administrative, taxation, legal-judicial reforms, the reform of regulation systems, supervision and control by agents, the creation of institutions which reduce transaction costs within the economy, institutions linked to foreign trade policy and reforms of the financial system, and even reforms of issues linked to the consolidation of stabilization plans. We can also include this type of approach in the traditional form model, by supposing that the "stock" of institutions *per capita* varies with time (accumulation of social capital) if there is a tendency to save resources for investment in social infrastructure.[17] The following equation describes this particular situation:

$$1_t = s_1 . Y_b \, 0 < S_1 < 1 \qquad \text{(XI)}$$

[17] Bandeira & Garcia (2002) works in the same way when they try to include institutions, in the broad sense of the word, in a growth model. This vision is interesting, even though, in my opinion, it is difficult to measure the savings effort.

These possible forms of including the institutional variable, in the specific case of this paper, in the social infra-structure, may lead to the establishment of empirical tests. From such tests we can define more clearly in what precise way social infra-structure affects growth quantitatively.

Growth has two dimensions: quantitative and qualitative (Rodrik, 1999). It would appear that there is little doubt about the fact that institutions — their attributes — affect growth from the point of view of their qualitative dimension. Economic development depends on the quality of the institutions. What needs to be investigated empirically in future — and the purpose of this work is to open the way for new research — is if *per capita* income increasing is also affected by social capital, here understood to be social infra-structure.

CONCLUSION

This paper tried to introduce a problem, which is: there is a prevalent idea that there are relationships between something we can define as social capital and economic performance; in particular, that there is a relationship between this variable and economic growth. What needs to be discussed is how we can model such a concept and how we can measure it. This is a necessary step for the development of new researches.

In summary, we can conclude that the main hypotheses to be put forward on this subject are: apparently (i) social capital is a relevant variable in models of economic performance and (ii) social capital can be included in models and measured within an analytical-empirical structure which seeks to explain economic growth.

I have argued in this work that social capital should be seen as a set of rules, which generate smaller transaction costs for the economy and increase the productivity of factors. For this reason, I believe that the concept of social capital as social infra-structure is more accurate.

In my point of view, future research in this field has to involve econometric studies to measure how such a variable affects growth.

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