

# COMPETITION AND CIRCULATION OF ECONOMIC ELITES IN PERU\*

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Abstract. This study aims at understanding the behavior of economic elites. To do so, the paper presents two related theories, one about social networks and the other about economic elites. These theories are constructed in the context of two different kinds of capitalist societies, which would correspond to the First World and the Third World. The paper then examines the empirical data of Peru to see whether they are consistent with the predictions of the elite theory; indeed, they are. Although statistical tests are still pending, the theory of economic elites seems promising for explaining certain facts of the Third World. Economic elites do not circulate endogenously; in addition, reforms in the market/state mix of the economy do not induce this circulation. If economic growth depends on the competitiveness of the economy, which in turn depends on more entrepreneurial elites, policies to help the circulation of elites (competition in this sphere) are badly needed.

**KEY WORDS:** social networks, inequality, economic development, social exclusion, non-Walrasian markets, non-market exchange.

## 1. Introduction

The behavior of economic elites is relatively understudied in the literature. For instance, the topic of social mobility does not include studies about the degree of social mobility towards the top of the income pyramid. Are elites protected against newcomers? Is this protection based on natural barriers or is it constructed by the elites themselves? In general, what do economic elites do in order to maintain their social position? What changes if any has the current processes of globalization and liberalism brought into the circulation of elites and into competition? Such are the questions that this study intends to answer, theoretically and empirically.

The theoretical constructions to be presented are based on two general assumptions about capitalist economies. Regarding the markets system, it is assumed that these economies operate with both Walrasian and non-Walrasian markets. The rationing mechanism operates through prices in the first case and through quantities in the second.

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The second assumption states that there are two types of capitalist societies that differ according to their initial conditions. Individuals who participate in the economic process are endowed with economic and social assets. According to the initial degree of inequality in the individual endowments of these assets under which societies were born to capitalism, two types of capitalist economies are distinguished. The relatively less unequal society will be called “epsilon society” and the relatively more unequal will be called “sigma society.” Economic, political and cultural assets are unequally distributed among individuals in sigma society because its foundational shock is characterized by a conquest or colonization of populations that inhabited its geographical region. The legacy of colonial domination is such that the descendants of those aboriginal populations are subject to political and cultural exclusions. The First World countries are supposed to resemble the epsilon society and the Third World countries the sigma society (Figuerola 2001a).

In epsilon society, social mobility should be very significant. In this society, one should expect that individuals do not inherit their position in the income distribution. The transition matrix between generations should show a trend towards equality in the distribution of incomes. The income distribution process should be similar to the biological process that Francis Galton studied regarding the relationship between the heights of children and those of their parents. As we know, Galton showed that with the passage of time "there is regression towards the mean"; that is, over the generations heights tend toward equality.

In the First World, however, the actual degree of social mobility is still under debate. Initial empirical studies on intergenerational incomes of children and parents tended to show that, in fact, the correlation between these incomes was very low. Thus, based on studies made in Europe and the United States, Gary Becker concluded, "Regression to the mean in earnings in rich countries appears to be rapid... In all these countries, low earnings are not strongly transmitted from fathers to sons" (cited in Solon 1992, p. 394).

A detailed study based on a sample of Connecticut (USA) residents, which used the transition matrix approach, challenged that view and showed that children tend to occupy their parents' position in the income distribution (Menchik 1979). More recent studies for the case of the United States indicate that the correlation between the incomes of children and those of their parents is positive and much higher than what previous studies calculated (Solon 1992; Zimmerman 1992). The conclusion of these studies is that intergenerational income mobility in the United States is much weaker than previous estimates had suggested. No such studies seem to exist for the Third World.

This paper introduces social network as another component of the resource endowment of individuals. The definition adopted here is the following: *social network is the size and strength of the individual's set of personal relations*. Social network is an asset because it enables the individual to take advantage of economic opportunities. It is also assumed that social networks are initially unequally distributed among individuals. The role played by social networks in the reproduction of the initial inequality is the central topic of this paper.<sup>1</sup>

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<sup>1</sup> A distinction must be made between “social network” and “social capital.” The latter usually refers to the degree of trust among individuals in a social group; hence, some may be high-trust groups (operating with low transaction costs), whereas others may be low-trust groups (operating with high transaction costs). The literature on social capital is vast (cf., Coleman 1990, Putnam 1993). In this

The paper content can be summarized as follows. The theory of social networks is developed in section 2 and the theory of elites in section 3, where the macro context refers to an epsilon economy. These theories are presented in a sigma economy in section 4. As a first approximation, the empirical predictions of the elite theory in a sigma society are confronted against the Peruvian data. Section 5 presents the main results. The paper ends with a section of conclusions.

## 2. A theory of social networks in an epsilon society

In standard economics, market exchange constitutes a particular type of social relations. It is impersonal, with no additional social ties beyond the exchange of goods. Just to make sure, market exchange is defined by four main traits: (1) it is voluntary; (2) it is impersonal; (3) the underlying motivation of individuals to exchange goods is self-interest; (4) the only constraint that individuals face to exchange goods is their resource endowments. The main implications of this type of exchange include: (a) only one relative price will prevail for all people in the exchange of each pair of goods; (b) the balance for each exchange is zero.

In addition to market exchange, people practice sociability, people engage in friendships and social connections. Is there an *economic* logic underlying those social connections? The theory proposed here assumes that social networks produce an economic return. Activities that are directed to build and maintain social networks are part of the economic logic of individuals because social networks produce economic returns. The motivation of self-interest induces people to seek social networks.

But, why would individuals need friends in a market economy? It is clear that friendship cannot generate significant economic returns in a situation of Walrasian and perfect markets—where large number of buyers and sellers participate, all price-takers, supplied with perfect information, and where the price of the good is the rationing mechanism to allocate the quantity of goods among buyers and sellers.

In the case of non-Walrasian markets, where the rationing mechanism is based on quantity-rationing, creating thus exclusions, having friends may help the buyer or the seller to have access to these markets. Non-Walrasian markets arise from the particular nature of some goods, such as social norms that may imply a fixed market price, asymmetric information, or thresholds of resource endowments needed to make transactions.

In particular, labor, credit and insurance markets operate as non-Walrasian. Because these markets are very significant in the reproduction of inequality, they will be called *basic markets* here. The assumption is that there exists a hierarchy of markets within the market system, with basic markets ranking on top. Not all markets have the same importance in the process of production and distribution. Individuals, therefore, need non-market relations (friends and social networks) in order to participate in the basic markets.

It should then be noted that the characteristic of market exchange as impersonal social relations indicated in standard economics correspond to Walrasian markets only.

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paper “social capital” is a trait of social networks, as will be shown below. At the aggregate level, society seen as a large social network, the degree of trust and the corresponding transaction costs will depend most likely upon the degree of inequality.

Non-Walrasian markets require personal relations and social networks. However, Walrasian markets and non-Walrasian markets share the other characteristics of market exchange indicated above.

In other cases, markets may not exist. Take the case of protection against risks. The insurance market is limited to the transaction of insurable risks only. Risks that are uninsurable in the market need another type of solution, based on social networks. Hence, market failures—including here goods that are transacted in non-Walrasian markets and goods for which markets do not exist—induce the development of social networks.

Market failures might be solved by state intervention. The good in question may be taken out of the market and distributed to people in the form of public good. The assumption made here is that the supply of public goods is always limited and cannot solve market failures, even if the supply of public goods were neutral with respect to inequality. State failures also induce the development of social networks.

Another way to solve market failure and state failure is through non-market exchanges. What forms can non-market exchange adopt? Consider *reciprocal exchange*: people exchange goods subject to the norms of reciprocity, which refers to the exchange of favors over time. Expressions such as “you scratch my back and I’ll scratch yours” (“*hoy por ti, mañana por mi*” in Spanish) serve to illustrate the logic of reciprocal exchange.

As in the case of market exchange, reciprocal exchange is still voluntary and based on the individual’s motivation of self-interest. But in contrast to market exchange, reciprocal exchange includes the norm of reciprocity as another constraint. Reciprocal exchange operates under personal social relations, which require a social network. The implications of reciprocal exchange include: (a) relative prices in the exchange of goods need not be uniform for all participants; (b) in each transaction, the balance of the exchange is attained in the long run, not necessarily in the short run. Positive or negative outcomes in a particular exchange can be balanced in the following exchanges. Under reciprocal exchange, a single transaction between two people is just like one star in a firmament of many transactions.

In cases in which both market and reciprocal exchanges are feasible, individuals will choose one of them by evaluating their relative net benefits. If using the market is less profitable than using the network, they will have incentives to use the latter. Hence, higher transaction costs in market exchange create incentives for the formation of social networks; situations where markets are underdeveloped or do not exist would also create incentives for the formation of social networks.

In sum, in an epsilon economy, market failure, state failure, and reciprocal exchanges generate incentives for the development of social networks. Both exchange in non-Walrasian markets and reciprocal exchange require personal social relations and thus social networks. Exchange in Walrasian markets does not require social networks.

Social networks produce economic returns through several mechanisms. Some examples are:

- (a) Social networks increase the degree of trust among individuals and thus reduce transaction costs. Due to the existence of *basic markets*, the individual has to be known and trusted to obtain credit, insurance or a job. Social networks allow the individual to accumulate more physical capital.

- (b) Social networks are valuable where markets do not exist. Individuals get protection against possible losses arising from *uninsurable* risks, those that the market cannot insure due to moral hazard and adverse selection problems. Because profits of firms are uninsurable, markets do not protect people against bankruptcy.
- (c) Social networks allow people to have more efficient access to business opportunities due to economies of scale in information and complementarities in factor endowments of individuals.

Because social network produces an economic return, it may be considered as an asset in the individual's endowment of resources. If it is going to be an asset, a capital good, it must satisfy the following properties:

- (a) Social network is a stock, the stock of social connections.
- (b) It provides an economic return.
- (c) It can be accumulated through investment.
- (d) It needs maintenance to avoid depreciation.

Conceptually, social network complies with these requirements.

The theory of social networks can thus be stated more precisely as follows. Individuals participate in the economic process endowed not only with economic, political and cultural assets, but also endowed with social networks as another asset. People seek to invest in social networks seeking to maximize economic returns (the highest average returns on economic resources with the lowest risk), subject to the constraints given by their initial resources endowments. People invest in social networks with the expectation of economic returns.

But, what does this return depend upon? The assumption is that this return depends upon the group's resource endowments. Social network is an asset that is complementary (not substitute) to the other forms of capital. The higher the stock of physical and human capital is, the higher the return of social network and the investment level in this asset become. There are more profit opportunities when the individuals who are part of the social network are endowed with large stocks of capital. There is more social protection against uninsurable risks when the group's stock of capital is large. On the other hand, the higher the stock of social networks is, the higher the return of economic assets. Another factor influencing the economic returns of social networks is the degree of market and state failures in society. The higher is this degree, the higher the returns, and the higher the investment in social networks.

According to this theory, poor people would have the incentive to become members of the social network of wealthy people, but not vice versa. Exchange of favors can only work among equals. Hence, the poor will form social networks with other poor people and the wealthy with other wealthy people. The economic incentives lead to segregation in the formation of social networks. Individuals cannot "buy" friends in a market. There is no market for friends. Friendship is formed through non-market exchange, where the motivation is not altruism but selfishness. Opportunity for economic success travels along social networks. However, opportunity-enhancing networks cannot be bought in the market place. Social network formation is then business. Individuals can still choose their friends,

but subject to their resource endowments. This theory of social networks predicts segregation by incomes among social groups.

Under a different theoretical approach, neoclassical choice theory, Akerlof (1997) and Becker and Murphy (2000) have constructed models of choice under social interactions. Referring to the case of the US economy, a society without colonial legacy but a legacy of ethnic minorities, they have shown that individuals choose their social groups and that this choice leads to segregation in incomes and neighborhoods between different ethnic groups (blacks and whites). Although these results coincide with the predictions reached here, the causal factors are different: subjective preferences in the neoclassical theory and objective economic returns in the theory presented here.

In sum, two empirical predictions can be derived from the theory of social networks: investment in social networks will be higher when (a) the degree of market and state failures is higher and (b) the endowments of economic assets of the group are higher. The size of social networks is then endogenous. The existence of segregation is another empirical prediction of the theory.

In an epsilon capitalist society, social networks may play different roles depending on the social class of individuals. Most workers are excluded from credit, insurance and labor markets. These market failures are not compensated by the supply of public goods by the state. Hence, workers will seek to satisfy their necessity for life security—a human primary necessity in the Maslowian theory—not only through markets or the state, but also through social networks; they will seek to invest in social networks as part of their life survival strategy. This protection will be the basic economic return of social networks.

What about the economic elites' behavior to invest in social networks? What type of returns they seek when joining social networks? These questions are analyzed in the next section.

### **3. Economic elites in an epsilon society**

In the standard literature, elites are defined as those social groups at the top of any rankable social-power scale (Bodley 1999, p. 596). The rankable scale includes various types of assets, such as economic or social. Elites are important to understand society because they have social power. Social power refers here to a group of individuals' ability to impose their will upon others. This is the well-known Weberian definition of social power. In this definition, however, power appears unconstrained.

In economics, social power is subject to constraints. Take the case of the theory of the monopolist. The monopolist acts guided by a motivation—maximization of profits—and has the ability to impose a market price to consumers, but subject to the constraints of demand conditions and cost of production conditions. Actually, given these constraints and given the motivation of profit maximization, the monopolist could use his power to set, say, the highest price, but he will not. The monopolist is compelled to choose what is good for him, according to his motivation. There will be one and only one price that will satisfy his goal of profit maximization. The price cannot be arbitrarily chosen. If demand or cost conditions change, the monopolist will choose another price. Price is endogenously determined in a monopoly market.

The monopolist case shows that power structure may be exogenous to the economic or political process, but the particular actions taken to exercise that power are endogenous. In this study, social power of the elites will be considered as a constrained power. The Weberian definition will include now the actions and reactions of the people that the elites seek to impose their will upon. Because power has a purpose, the elites are prisoners of their goals, much like the monopolist.

Many years ago, Bottomore proposed a theoretical hypothesis about the existence of elites. His assumption was that in every society there is, and there must be, a small group that rules over the rest of society. This group is the elite (Bottomore 1964).

But, why do elites constitute small groups? In his classic study on political elites, Mosca presented an interesting empirical hypothesis: the size of the political elite does not increase proportionately to the size of the society. Therefore, the proportion of the governing body in relation to the total population will decline as population increases. This relationship implies that the power of political elite will also rise as population increases. Mosca, however, did not explain the reasons (the theory) underlying his empirical hypothesis (Bottomore 1964).

A theoretical proposition that has been largely developed in the literature is based on biology and bio-cultural processes. Memory restricts the number of people who can rule. In fact, information management and decision-making are inherently more difficult in large groups. This is summarized as follows: “If members of a decision-making elite must interact with each other face-to-face, we would expect that it never exceed 500 people, regardless of the total size of a society...Political elites necessarily become a smaller, more powerful proportion of any society as scale increases, just as Mosca predicted” (Bodley 1999, p.596).<sup>2</sup>

The same principle should apply to economic elites, as Bodley has argued. As we all know, Pareto defined the economic elite by the concentration of economic resources. Therefore, it follows that “The Pareto elite will almost invariably be a proportionately smaller and powerful minority as either the scale of society or its wealth increases” (Bodley 1999, p.596). Accordingly, economic elites must exist in societies and they must be small groups of individuals that rule over the rest of the society in the economic process.

In the political science literature, it is usually proposed that political elites are able to affect political outcomes regularly and substantially (Higley and Gunther 1992, p. 8). Similarly, one can establish the proposition that economic elites affect the income of many people because they concentrate so much physical capital and income flows in the form of profits. The behavior of the economic elites regarding the use they make of profits—consuming, investing abroad, investing domestically—affects the level of incomes of the masses regularly and substantially. In complex and modern societies, the exercise of economic power and its consequences operates through the market system. Thus, unlike other systems such as slavery or feudalism, economic power under democratic capitalism is impersonal.

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<sup>2</sup> Granovetter (2005) also puts forward this hypothesis: “Larger groups will have lower network density because people have cognitive, emotional, spatial, and temporal limits on how many ties they can sustain” (p. 34). Another force to have a small elite group is that it is easy to enforce norms against free riding, making collective action more likely to succeed.

The empirical implication of this theory that elites must exist and must be small is that the only change that elites can undergo is the change in membership over time. This is called “the circulation of elites” hypothesis. How could this happen? “The elite undergoes changes in its membership ordinarily by the recruitment of new individual members from the lower strata of society, sometimes by the incorporation of new social groups, and occasionally by the complete replacement of the established elite by a ‘counter elite’, as occurs in revolutions” (Bottomore 1964, p.12). Bottomore is referring here to the concept of political elite, but it may also be applied to study economic elites. Now, is the circulation of economic elites endogenous or exogenous? A theoretical answer is provided below.

On the individual motivations of the economic elites, the assumption proposed here is that economic elites in an epsilon society seek not only to maximize profits but also to maintain their privileged position in society; moreover, between these two objectives, elites have lexicographic preferences, by which maintaining the social position is a priority. They prefer more profits than less, but without losing social position; that is, they are not willing to substitute more profits for a fall in their social position.

What are the mechanisms that reproduce the elites’ privileged position in an epsilon society? This is done through various mechanisms:

- (a) The economic elites invest in projects that have high returns even if they are subject to high risks because these groups have the economic capacity to bear those risks.
- (b) They use the insurance market to protect their capital stock against insurable risks.
- (c) In addition to profits, they use their access to capital market to finance investment.
- (d) Influence on government policies.
- (e) Protection against uninsurable risks.

The first mechanism comes from the elites’ initial endowments of physical capital. The large size of their wealth gives the elite a significant economic advantage over any other groups. Mechanisms (b) and (c) refer to their privileged access to basic markets. The same can be said about the last mechanism because politics is all about big money and big connections. Mechanism (e) comes from the direct effect of high social networks.

Social networks play a significant role in the reproduction of the economic elites, either directly or indirectly through the market system. Social mobility is blocked by the mechanisms of market exclusions, which facilitate the social reproduction of the economic elites. Market exclusions can then be seen as “natural” barriers to social mobility because they are built in the economic process. The political system is an additional mechanism. As to the direct effect, social networks give elites a higher degree of social protection, reducing greatly the risk of an economic disaster, as of being expelled from the elite. Members whose firms may go bankrupt will be able to maintain their membership in the economic elite. In fact, the firm may disappear, but the capitalist may not. In this manner, economic elites construct additional barriers to social mobility to the top.<sup>3</sup>

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<sup>3</sup> A simple illustration of this theory can be presented as a modified model of the monopoly firm’s theory. The relevant set of equations can be shown as follows:

$$\text{Maximize } P_j = P_{bj} Q_{bj} - H(Q_{bj}; V)$$

#### 4. Social networks and elites in sigma society

In addition to market exclusions, sigma society operates with strong social exclusions. Descendants of aboriginal or slavery populations are second-rate citizens; therefore, the distribution incidence of public goods is not neutral. These populations are excluded not only from basic markets, but also from the supply of basic public goods (education, health, social protection, justice). In addition, they are poorly endowed with the asset of social networks.

The social structure of a sigma society is represented in Table 1. Column 1 lists the  $n$  individuals that make up society, ranked by resource endowments. Individuals  $1$  to  $m$  constitute the capitalist class as an elite group, and the rest are the workers. Workers are endowed with unequal quantities of human capital, the ranking of which is shown in the third column. The fourth column shows inequality in political and cultural rights, called social rights. There are three large ethnic groups in society A, B and C, who are ranked according to their endowments of social rights ( $S_A > S_B > S_C$ ). The capitalist class belongs to ethnic group A, workers  $m+1$  up to  $r$  belong to ethnic group B and workers  $r+1$  up to  $n$  belong to ethnic group C.

These are the initial conditions of sigma society. This initial inequality in the distribution of stocks of resources is going to generate inequality also in the distribution of the flows of national income. Ethnic group C will be the poorest. The question is whether this initial inequality tends to reproduce itself or tends to disappear in the process of economic growth.

In general, the social network theory developed for epsilon economy also applies to sigma society. In particular, both exchange in non-Walrasian markets and reciprocal exchange require social networks. There is, however, an important difference. Due to the higher degree of state failure in sigma society, social networks play a more significant role in the survival strategy of workers and in the reproduction of the initial inequality. As in the case of epsilon society, economic incentives lead to segregation in the formation of social networks in sigma society. Given the hierarchical social structure of sigma society, social networks cannot change the initial inequality in asset endowments. Ethnic groups subject to a high degree of exclusion will have no choice but to form separate social networks. The

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Subject to

$$P_{bj} = G(Q_{bj}; Z), G_1 < 0$$

$$Q_{bj} = F(K_j, L_j, N_j), F_i > 0$$

The first equation shows the profit equation of the monopoly firm, where  $P_j$  represents nominal profits,  $P_{bj}$  is the nominal price of good B,  $Q_{bj}$  is the quantity of good B produced, and  $H$  is the cost function. The firm seeks to maximize profits subject to the inverse demand function for good B and the production function, which appears as the third equation. Output depends upon physical capital  $K_j$ , labor  $L_j$  and the social network  $N_j$ , which the owner of the firm  $j$  belongs to. Social network appears as an input in the production process. The larger the quantity of input  $N$  (a social network of a larger size and power) the higher is the quantity of output and, for given quantities of capital and labor inputs, the higher the returns of these resources (as mean and risk). The terms  $V$  and  $Z$  represent exogenous variables of the system. Profits depend now upon the social network of the owners of the firm and part of profits can be seen as returns to social networks.

degree of segregation in sigma society will be much stronger than in epsilon society. To a large extent, segregation in sigma society is exogenous.

This conclusion is represented in Table 1. In sigma society, social network endowments among individuals are also unequally distributed. Thus social networks reinforce the social reproduction of the initial inequality. In the process of the income growth of individuals, there is path dependence; that is, their initial conditions count. Sigma theory predicts strong segregation. The last column shows just two social networks (*I* and *II*) in each of the segments of social structure to indicate that every social network includes only individuals from the same class and the same ethnicity.

In the process of economic growth, social mobility can take place but within the same class and ethnicity. There are no social networks that are cross-class or cross-ethnic groups. Segregation is the general feature. Segregation is not the result of economic choice—either in the form of independent individual choice or in the form of individual choice under social interactions, as studied by (Akerlof 1997) and Becker and Murphy (2000)—; it is rather the result of social exclusion, a social imposition. Segregation is exogenously determined.

In epsilon societies, there may also exist ethnic groups but they all share the same rights. Thus, in Table 1, the relation becomes  $S_A = S_B = S_C$ . The last column is not segmented now and it simply reflects the inequality in capital endowments. Thus, in the process of growth there can be social mobility even to the top, that is, to the elite group. Economic elites are strongly challenged because there is no social exclusion. The empirical hypothesis of circulation of elites is then logically derived.

By contrast, the challenge of reaching the position of economic elites is not so strong in sigma societies. The blockages are the effect not only of market exclusions but also of social exclusions. Ethnically, aboriginal businessmen may be successful but that fact does not place them immediately into the membership of high social networks of society. The empirical hypothesis that emerges is that in sigma societies the endogenous circulation of elites can hardly occur.

Evoking the famous dialogue between writers Fitzgerald and Hemingway, one may conclude that “the only difference between the rich and the poor is money” is a sentence that seems to apply properly to epsilon societies, but not to sigma societies. In terms of social mobility, one could also conclude that in epsilon societies “money talks”, whereas in sigma societies “money alone does not talk.”

In sigma society, elites are highly endowed with all types of assets, including social networks, and have lexicographic preferences on social position and profits (as in epsilon society); however, in sigma society, elites operate in a society full of blockages to social mobility. From these assumptions, two empirical predictions can be derived from the elite theory. The first prediction is that social network is a factor that contributes to the reproduction of the social position of the elite (as in epsilon society). The second prediction is that elites do not circulate endogenously, but only as a result of major upheavals in society (contrary to epsilon society).

## 5. The behavior of economic elites in Peru

The empirical data needed to test the hypotheses presented above for the Third World are not available. Some basic data have been constructed for the case of Peru, which will allow us to present some evidence on the behavior of the elite regarding the formation of social networks.

### 5.1. Empirical definition of the economic elite

Peru is a very unequal society. The economic elite, therefore, represents a very small fraction of the population. Using even a very ample definition of the elite families, which includes the owners of large firms (with more than 20 workers) and the professionals with university degrees attached to them, the estimate one gets is around one-percent only (Figueroa 2001b).

The particular sample of elite families drawn for this study comes from a list of Peruvians who participate in the ownership of the largest firms in Peru. The universe is the set of firms that ranked at the top 40, according to their sales, in any year during the period 1992-1998. This set contains 93 firms. The owners were defined as the members of the directory of each firm as of February 2000. This information is available in the Office of the Public Registry, National Commission for the Supervision of Firms (CONASEV). In the period of analysis many firms went into property changes (takeovers and mergers) (8), others were taken over by multinational corporations (11), others were state firms (2) and others lacked information (33); therefore, the total number of firms studied is only 39 (Figueroa 2001b).

The next step consisted in identifying Peruvians from the set of directors of these 39 firms. Considering ten different directors per firm, on average, this would imply a set of near 400 people. The group size estimated is, however, only 37 Peruvians. Part of this gap is explained by the presence of multinational corporations in the economy, which in turn implies the presence of foreigners in the directories; another part is due to the incomplete information of directors per firm, but the most notable reason is the *pronounced overlaps of directors*. The conclusion is unavoidable: given the cut off value in the ranking of firms, the local economic elite is very small in Peru. (Peru's population is around 27 million.)

Within the group of the top 1,000 firms in Peru, the top 4% (40 firms) concentrated 36% of total gross sales and 64% of total profits before taxes in the period 1993-1998. This is depicted in Table 2. These figures show the high degree of concentration of businesses in Peru, even among the largest firms. Nearly 40 Peruvian families and few multinational corporations concentrate a large magnitude of sales and profits.<sup>4</sup> Another estimate based on data from the Government Revenue Service (SUNAT) shows that the largest 0.4% of contributors (around 6,000 firms) accounted for 92% of total sales tax revenue in 1994 (Durand 2003, Table 2.3 and p.99).

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<sup>4</sup> Regarding the degree of concentration of profits, the mean Gini coefficient within the top 100 firms with positive profits during the period 1997-1999 is 0.88(!).

## 5.2. *Overlaps in positions of board of directors as social networks*

What is the economic organization adopted by elite families in Peru? The elite theory presented above is consistent with the view that elite families operate forming economic groups. The concept of economic group refers to a group of families who own and control a group of firms and operate as a single economic unit. The classical work of Leff (1978, 1979) puts forward the hypothesis that in the Third World elite families will operate in the form of economic groups. Leff's theory assumes that this is a rational way to overcome factor-market imperfections that characterize the Third World, in which capital markets and credit markets are either non-existent or under developed.

Table 3 shows the network of social relations among the elite regarding the overlaps in positions of board of directors of Peru's largest firms. In Table 3, the same people are presented horizontally and vertically, and thus each entry says whether or not the two persons share the control and ownership of at least one firm; if the cell is marked 1, they do, and if it is marked 0 they do not. For instance, person 1 is connected to other 18 Peruvians in the control and ownership of several firms. This information can be read either horizontally or vertically. Person 25 is connected to other five Peruvians. Person 37 is connected to no one, and so on.

Table 3 shows the existence of a group where the network is very dense, the group 1-25. This is a highly interlocked group. The group 29-31 constitutes a separate sub-group (the fishing industry). And the group 32-37 is made of individual owners of single firms, with no connections with the rest of the Peruvian elite.

If there were no social networks among individuals, cells with the value of 1 would appear only in the diagonal of the Table 3. If all individuals formed one single network, all cells would have the number 1. Thus, a simple index of the degree of density ( $d$ ) in a social network can be established as follows:

$$(1) \quad d = (m - n)/(n^2 - n)$$

The term  $m$  is the number of cells in the matrix with number 1, that is, where nodes are present; the term  $n$  is the number of individuals. This index varies from zero (no networks, where  $m = n$ ) to one (all belong to a single network, where  $m = n^2$ ).

For the total 37 Peruvian elite families, the calculation from Table 3 results in  $d=0.20$ ; for the group of families 1-25, we get  $d=0.43$ ; for the group of families 1-10, the value is  $d=0.60$ . These results suggest that the group 1-10 operates as a very dense economic group; the group 1-25 operates as a less dense economic group; and the total 37 families as a weak economic group.

The last column of Table 3 shows the connections of the Peruvian elite with multinational corporations. Only 8 out of 37 families do not show direct relations with any corporation as member of the board of directors in any firm. But indirect relations do exist, because their Peruvian partners are connected to corporations through the board of directors. Thus, the Peruvian elite is strongly connected to multinational corporations.

In relation to the hypotheses put forward above, economic groups—not family firms—seem to be the main form of business organization of the Peruvian economic elite. Hence, families join in establishing a multifamily and multi-firm industrial organization.<sup>5</sup>

It seems then that the major reason behind the formation of economic groups is the positive social network effect upon non-insurable risks. Social networks are part of a survival strategy of elites in order to protect themselves against economic disasters and also as a development strategy, at the same time. In fact, the present Peruvian elite has survived all the vicissitudes of the society, such as the hyperinflation and severe recession of the 1980s, the political violence of the 1980s and first part of the 1990s, the liberal reforms of the 1990s, the current recession that started in 1998, and the political crisis of 2000-2001.

The evidence commonly cited in the literature that the mean death rate of large firms is much smaller than the counterpart rate of small firms seems to be the other side of the coin. Economic elites are socially more protected against economic disasters. The majority of the 26 families that Alcorta identified as the economic elite in 1983 (Alcorta 1992) also belong to the core of the economic elite around the year 2000. The members of the economic elite may lose control of a firm or may close a firm, but as economic agents they will hardly disappear.

### 5.3. *Circulation of elites*

The work of Thorp and Bertram (1977) presents the general economic history of Peru in the period 1890-1975. The economic history of this period is mainly the history of the oligarchic families.

Gilbert (1982) studied three of the most traditional families of the Peruvian economic elite: Prado, Aspillaga and Miro Quesada. He showed that the behavior of family firms had strong social ties with other families of the elite. Intermarriage within the elites was also the norm. The Prado and Aspillaga families disappeared in the sixties, while the Miro Quesada family runs one of the principal newspapers of Peru up until now. Another finding of Gilbert's study is the identification of almost thirty families as the core of the oligarchic political-economic system of Peru in the 1960s.

A more recent study has been made on the Prado family, one of the most long lasting traditional families in Peru (Portocarrero 1995). This family played a significant role in the Peruvian economy in the period 1890-1970. The economic assets of this family included firms in different sectors, including a bank. The family reproduced itself by following certain rules, such as the intermarriage within the Peruvian elite, the allocation of certain family members to particular sectors to have a control of the firms of the empire, and by giving the male who is primogenitor the leadership of the empire.

General Velasco's revolution (1968-1974) marked the end of the old oligarchy, which was largely based on land ownership. The agrarian oligarchy practically disappeared

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<sup>5</sup> It should be noticed that Peruvian legislation uses a different definition of economic group: group of *firms* that are under the control of a firm or of individuals that operate as a single decision unit. This definition has the purpose to set limits to bank credit directed to particular firms. The literature on economic groups in Latin America also uses this definition. In this study, the economic group refers to group of *families*, that is, refers to the economic agents.

as a result of the agrarian reform. Today's economic elite includes few survivors of those traditional families; it mostly includes new families that emerged after this revolution.

Velasco's revolution also marked the end of a period of an economy with a higher mix of market/state context and initiated a new context with a lower mix. Around 50 large state firms were created, mostly as part of a program of nationalization of foreign capital (Peru, Banco Central, *Memoria 1977*, Table 14, pp. 43-44). Protection was given to the industrial sector. The government of President Fujimori started in 1990 a program of liberal economic reforms to increase the mix of market/state. Most state firms were privatized and acquired mostly by foreign firms again. Today few firms still remain in the hands of the state. The five largest state firms include: PETROPERU, ELECTROPERU, SEDAPAL (water and sewage services) and CENTROMIN (mining) (Peru, Banco Central, *Memoria 2004*, Annex 61, p. 239). State development banks were closed. Land markets were opened. The degree of openness of the economy increased, particularly in the capital markets. Thus, Peru has completed a kind of full cycle in economic reforms since 1950.

Have the neo-liberal reforms had any effect on Peru's economic elites? Not a significant one. The new core of the Peruvian elite that appeared after the Velasco's revolution has been able to survive the neo-liberal reforms. As was shown in Table, the strategy was to join the multinational corporations that took over many state firms and open new firms in Peru. The share of the Peruvian elite in capital ownership has possibly declined, but they remain as the domestic elite group and also as a small group.

In Peru, thus, there has been a circulation of the elites due to external shocks—a nationalist military revolution—not due to the process of neo-liberal economic reforms. Economic growth, which was significant in the 1950s and 1960s, did not bring changes in the elites either. This result is in accord with one of the predictions of elite theory in the sigma society.

#### 5.4. *Collective action*

Olson's classical theory on collective action predicts that small groups have a higher likelihood to overcome the free rider problem (Olson 1965). The group of economic elites is small and their organizations should therefore be strong. Is this proposition empirically consistent with the behavior of economic elites?

The major organization of firms in Peru is called CONFIEP (Confederación Nacional de Instituciones Empresariales Privadas). Even though there are also associations by economic sectors, 26 in total now, CONFIEP includes them all; moreover, this is the major confederation of business organizations in Peru.

CONFIEP was founded in 1984. It offers several services to its members. But its basic purpose is to operate as the voice of the economic elite. According to its statutes, CONFIEP must change its boarding directory every year. For the period of 1987-2001, the number of total posts to be filled amounts to 1,260. These posts were filled by only 361 people. This gap shows that there is a concentration in the distribution of posts among the economic elite. The concentration is even higher if one takes into account the fact that 243 businessmen participated in the directorate only once; that is, for one single year only. In sum, only 118 businessmen have been in charge of CONFIEP in 15 years.

CONFIEP operates as the major pressure group in today's Peruvian society. This organization is in charge of protecting the group interests of the elite from undesirable

government interventions and from the pressure of workers. The collective action of the economic elite can be seen through the behavior of this organization.

Of course, the members of the economic elite also seek individually access to government decision-makers. This relation can take many forms, including corrupt practices, as they were made public in 2000-2001, when the population could watch on television many videos in which important entrepreneurs (Peruvians and foreigners) appeared making illegal dealings with Mr. Vladimiro Montesinos, the powerful advisor of President Alberto Fujimori.

#### 5.5. *Social networks as “exclusive clubs”*

The economic elite together with the upper middle class has created other forms of social networks that operate as exclusive clubs.

Exclusive schools are one of them. It is not rare to find some families who send their children to foreign schools. If their children are going to study in Lima, there are around fifteen exclusive schools. These schools offer international diplomas, which allow high school graduates admission to colleges and universities in the First World—and direct admission, without entrance examination, to Peruvian private universities as well. (These schools are nine: one is American, three British, two German, one French, and one Italian.)

Exclusive social clubs also constitute another form of social network. There is around twelve exclusive social clubs in Lima. These include three country clubs, two golf clubs, one yacht club and three more general social clubs.

Residential neighborhoods should also be considered as part of the networks. There are areas in certain districts of Lima (La Molina, Surco, San Isidro, and Miraflores) where the wealthy and only the wealthy live. These are areas where free transit of cars and people are not allowed. These areas can be viewed as islands of prosperity in a sea of poverty. As may be expected, these “islands” are highly protected areas, and residents share a more or less common life within these wealthy ghettos. Similar neighborhood structure is found in the rest of the largest cities of Peru.

The Peruvian economic elite have also constructed international networks. This takes the form of business networks with their foreign counterparts. This is the case of bilateral “chambers of commerce and industry”. It also takes the form of more personal business relations with foreign investors in the First World. It is well known that many families from the Peruvian elite own houses in cities like Miami, Los Angeles, and Madrid. They seem to seek entrance to social networks in the First World and thus must own houses in both Peru and abroad.

#### 5.6. *Economic power and the allocation of profits*

The economic power of the elite is based on the concentration of physical capital. But in the sigma society, this initial condition creates also concentration in political and cultural assets. As shown above, the social networks that are highly profitable are also concentrated in this group.

The elite families also concentrate profits, the income flow of capital. They decide on the use of profits, whether to invest locally or abroad. They have economic power in the sense that they impose their will upon others. Hence, they affect the incomes of millions in

society. In spite of much globalization and free mobility of capital, private investment in the Third World depends to large extent on domestic profits, that is, on the behavior of the domestic economic elite. Foreign investment takes place basically among First World countries. As Markusen (2002) has shown “Not surprisingly, the developed countries are the major source of [foreign direct investment], but perhaps less known, they are the major recipients as well” (p. 8).

The concentration of capital implies that the economic elite can impose ultimately their power on the government or workers by threatening to reduce investment. This power can be called the *Kaleckian threat*, for this proposition was initially presented by Kalecki (1943).

The behavior of elite families regarding investment in Peru has not been possible to measure. Information at family level is unavailable. At the aggregate level, national accounts calculate private investment as a residual of many other calculations. For what they are worth, national accounts show that nearly 75% of total investment was originated in the profits of firms in the period 1960-1974 (Peru, Banco Central 1975, *Cuentas Nacionales*, Cuadro 5, p. 20). This information is not available for the following years. In the case of Chile, where information is more complete, 60% of total investment was originated in the profits of firms in the period 1960-1997 (Benett, Loayza and Schmidt-Hebbel 2002, Cuadro 1, p. 53).

These pieces of information suggest that the behavior of the local elite is critical for investment in the Third World countries. This result is surprising in the face of increasing globalization in the world economy. One would expect that, with the liberalization of capital markets since the 1980s in the world economy, domestic investors should be displaced by foreign investment. But this does not seem to be the case. Paul Streeten has indeed made a striking observation: “in the light of globalization, it is a puzzle to find that domestic savings and investment are closer together for most countries than they were before 1914” (Streeten 2001, p. 103). It seems that the fraction of domestic profits that flight abroad is somehow compensated by the inflows of foreign direct investment. Hence, the behavior of investment is as if most of it came from domestic profits.

## 6. Conclusions

Social network is another important asset endowment with which individuals participate in a capitalist society. Social networks produce an economic return; it is an asset. The theory is that individuals seek to invest in social networks. The empirical predictions of this theory say that the investment in social network will be higher when the degree of market and state failures is higher and when the group endowments of other assets are higher. The poor and the rich invest in social networks. The poor invest in social networks mostly as part of their *physical* survival strategies, whereas the elites invest in social networks as part of their *social* survival and development strategies. In general, therefore, social networks contribute to the reproduction of inequality in society. As an asset, it is not an equalizing factor. Non-market factors play a significant role in market outcomes, but non-market factors (as social networks) are endogenous

This conclusion applies to epsilon and sigma societies. There is a difference, however. In sigma society, social networks play a larger role in the economic process

because the degree of state failure on inequality is higher than in the epsilon society. The degree of segregation and social exclusion is higher in sigma society than in epsilon society. Thus, the contribution of social networks to the reproduction of inequality is higher in sigma society than in epsilon society.

Economic elites are placed at the top of all rankable assets. The theory proposed here is that members of the elites act guided by self-interest motivations, which in their particular case include two objectives that are lexicographically ordered: they seek to maintain their privileged position in society and, only when this objective is assured, they seek profit maximization. The predictions of the elite theory depend on the kind of the capitalist society: the circulation of elites is endogenous in an epsilon society, but it is exogenous in a sigma society.

As a first attempt to confront theory with reality in this line of research, the empirical side of this study presents the case of Peru. Given the available data, the result is that Peru's economic elite operates in accordance with the predictions of elite theory. For an empirical definition of the elite, using a specific threshold in the ranking of firms, and using overlaps in the positions on boards of directors of the major firms as an indicator of the size of the elite group, the observed economic elite is small, and has remained so for the entire period of observation, since the beginning of the 1970s. The elite have constructed an interlocked business organization in the form of economic groups. The elites' networks take the form of "exclusive clubs." Collective action is stronger in the elites than in workers organizations. Collective action is found also among the poor, but it is relatively very weak due possibly to their strong physical fragmentation and social exclusion.

As the theory predicts, some elite circulation has occurred in Peru as a result of major upheavals. The land reform applied by the revolutionary military government during 1969-1974 eliminated the traditional oligarchy. The circulation of elites does not come endogenously from economic growth; it does not come from reforming the market/state mix of the economy either.

Finally, the power of the elite appears in their investment decisions. The life of many people depends upon those decisions. In spite of a higher degree of globalization in the world economy, including the liberalization of international capital markets, domestic investment still depends, to a large extent, on the allocation of profits by the domestic economic elite. Foreign direct investment still originates mostly in the First World and goes mostly to the First World as well. Since market/state reforms do not change the composition of the economic elites, towards more entrepreneurial agents, the degree of competitiveness of the economy will not increase significantly with those reforms.

Although more empirical work is needed, the policy implications of the theory presented here challenge the conventional views on development. The poor and the wealthy seek to accumulate social networks. But they form different social networks with different economic returns, in relation to mean income and risk reduction. In terms of risk reduction, the poor use social networks as part of their physical survival strategy. The elite group uses it as a device to maintain social privilege in society and expand capital accumulation.

In the Third World, the economic elites are endowed with larger quantities of economic and social assets, which give them capacity to build the most advantageous social networks. This superiority in social networks generates additional blockages to social mobility and contributes to the reproduction of income inequality. As in the theory of human capital formation in the schools, the "peer effect" in social networks is positive and

stronger for the elites. This conclusion is not in accord with the more optimistic view about the potentiality of social network to fight inequality that is found in the literature. For instance, in the *World Development Report of 2001/2002*, the World Bank says, “social networks are key assets in the portfolio of assets [for the poor and the rich], but their relative importance is greater for poor people” (World Bank 2001: 129). This wrong insight originates, it seems, from the “poverty approach” followed by the World Bank; an “inequality approach”, as followed in this paper, leads us to different results.

Although statistical tests are still pending, the theory of economic elites seems promising for explaining certain facts of the Third World. Economic elites do not circulate endogenously; in addition, reforms in the market/state mix of the economy do not induce this circulation. If economic growth depends on the degree of competitiveness of the economy, which in turn depends upon more entrepreneurial elites, policies to help the circulation of elites—that is, the competition in this sphere of the economy—are badly needed. Hence, changing the inequality in the individual endowments of economic and social assets in the Third World countries will do more for their development than reforms on the market/state mix or just social programs trying to increase the social network of the poor. This is what the theoretical and empirical results presented in this study suggest.

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Table 1. Social Structure in Sigma Society

Individual	Endowments			Social Networks
	Physical Capital	Human Capital	Social Rights	
1 2 · · m	$K_{b1}$ $K_{b2}$ · · $K_{bm}$	$K_{h1}$ $K_{h2}$ · · $K_{hm}$	$S_A$	$N_A$ (I) $N_A$ (II)
m + 1 m + 2 · · r	$\emptyset$	$K_{h(m+1)}$ $K_{h(m+2)}$ · · $K_{hr}$	$S_B$	$N_B$ (I) $N_B$ (II)
r + 1 r + 2 · · n	$\emptyset$	$K_{h(r+1)}$ $K_{h(r+2)}$ · · $K_{hn}$	$S_C$	$N_C$ (I) $N_C$ (II)

Table 2. Peru: Share of Top 40 Firms in Total Sales and Total Profits among Top 1000 Firms (percentages)

Year	Gross sales	Profits before taxes
1993	32.6	74.0
1994	33.8	56.0
1995	35.3	28.0
1996	36.3	72.7
1997	37.4	63.8
1998	37.5	88.0
Mean (1993 – 1998)	<u>35.5</u>	<u>63.8</u>

Source: Figueroa (2001b), Table 2.1, p.45, and Table 2.3, p.52.

Table 3. Peru: Elites as Economic Groups

Families	Romero	Graña	Miro	Quesada	Moreyra	Fort	De La Puente	Wiese	Onrubia	Brescia	Nicolini	Montero	Picasso	Bentin	Benavid	Bustamante	Woodman	Raffo	Piazza	Berckemeyer	Llosa	Beoutis	Ledesma	Rizo Patron	Montori	Sotoma	Cilloniz	Ferreyro	Michell	Wong	Batievsky	Matos	Galsky	Lucioni	Rodriguez	Custer	Ikeda	Cogorno	Arias	Multinational		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	MN				
Romero	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		
Graña	2	1	1	0	1	1	1	0	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Miro	3	1	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	
Moreyra	4	1	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Fort	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
De La	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Wiese	7	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Onrubia	8	1	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Brescia	9	1	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Nicolini	10	1	0	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Montero	11	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Picasso	12	0	0	0	1	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Bentin	13	1	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Benavides	14	1	0	1	1	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Bustamante	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Woodman	16	1	0	0	0	1	0	0	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Raffo	17	1	0	0	1	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Piazza	18	1	0	0	1	0	1	1	1	0	0	0	0	1	0	0	1	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Berckemeyer	19	1	0	0	1	0	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Llosa	20	1	0	0	0	1	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Beoutis	21	0	1	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Rizo Patron	22	1	0	0	1	0	1	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Montori	23	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sotomayor	24	0	0	0	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Cilloniz	25	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Ferreyros	26	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Michell	27	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
Wong Lu	28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	
Batievsky	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Matos	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Galsky	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Lucioni	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rodriguez	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Custer	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ikeda	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cogorno	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Arias Davila	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	

Source: Figueroa (2001b)



