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THE FUTURE OF CORPORATE GOVERNANCE IN KNOWLEDGE- DISPERSED COMPANIES

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ABSTRACT

Corporate Governance focuses its attention on the structure of the firm and the allocation of decision rights between owners and managers basically, plus other stakeholders. The field has developed extensively during the last decades inspiring reforms and practices as well as learning from them.

Most of the analysis though takes into consideration the XXth Century firm, rightfully so since CG is a very practical field in the overlapping map of law, economics and finance. The firm has probably been one of the most successful institutional innovations of the last centuries. Five hundred years ago only a few of them existed, today they are pervasive. Nevertheless, we cannot expect the firm to be the same a hundred years from now as it is today.

And if companies are going to be different, how will their corporate governance be affected? The present article does not expect to give an answer to such question. It only attempts to provoke debate and speculation about a possible evolution of the firm based on one single aspect of change: the increased use of dispersed knowledge. After suggesting some development and analyzing present innovations in that direction, we will open up to consideration how those potential changes may affect corporate governance. Of course, there are no specific conclusions, just a call to open our minds to future possible scenarios.

JEL: G30

Resumen

El Gobierno Corporativo pone su atención en la estructura de la firma y en la asignación de derechos decisorios básicamente entre propietarios y administradores, más otros "stakeholders". Este campo ha crecido mucho en las últimas décadas inspirando reformas y prácticas, como también aprendiendo de ellas.

La mayor parte de los análisis toman en cuenta a la firma del siglo XX, lo cual se justifica porque el Gobierno Corporativo es una disciplina empírica en el área donde se yuxtaponen el derecho, la economía y las finanzas. La firma ha sido probablemente uno de las innovaciones institucionales más exitosas de los últimos siglos. Hace quinientos años solo unas pocas existían, hoy se encuentran por doquier. No obstante, no podemos esperar que la firma sea la misma dentro de cien años que hoy.

Y si las empresas serán distintas, ¿cómo se verá afectado su gobierno corporativo? El presente artículo no espera dar una respuesta a esta cuestión. Solamente intenta provocar un debate y una especulación sobre la posible evolución de la firma basado en un solo aspecto de ese cambio: el creciente uso del conocimiento disperso. Luego de sugerir algún desarrollo y analizar las presentes tendencias en esa dirección abriremos la consideración de cómo esos cambios pueden afectar al gobierno corporativo. Por supuesto, no hay conclusiones específicas, solo una llamada a abrir nuestras mentes a posibles escenarios futuros.

JEL: G30

Knowledge within companies

In his seminal article “The nature of the firm” (1937), Ronald Coase introduced the concept of “transaction costs” which would, many years later, give rise to an entire new field called transaction costs economics and the economic analysis of organizations. His main point was an attempt to explain the existence and size of companies assigning resources within their borders through mandates considering that economists had already developed a sophisticated theory to explain how markets do precisely that through the price system.

He says: “An economist thinks of the economic system as being co-ordinated by the price mechanism and society becomes not an organization but an organism”, quoting F. A. Hayek (1933) who was at the time a fellow professor at the London School of Economics.

According to Coase, companies exist in order to save transaction costs, the costs of using the market, being the “most obvious” discovering what the relevant prices are. Companies would grow up to the point where the costs of organizing one more transaction within the company equal the marginal cost of such transaction in the marketplace.

Therefore, markets are efficient allocators of resources but companies exist because it is more efficient in some cases to organize transactions within them and save those costs. Coase also argued that there was not a clear cut divide between markets and firms but a continuum of different organizational devices. The borders between firms and markets may become blurred.

But nowadays what we are watching is not only that, but an increased use of “market-like” mechanisms within companies such as compensation schemes, internal prices and now, “information markets”.

As the role of information has become more important, and new technological advances have revolutionized the way knowledge could be tapped, companies are experimenting in many different ways over how to use the knowledge that is dispersed within their own organizations. They are asking themselves the same question Hayek raised in his much quoted article “The use of knowledge in society” (1945), and they are answering it developing market mechanisms.

The article will explore these new mechanisms such as predictive markets, information markets and others to find out how they mimic market mechanisms and whether they could work as markets do.

This means that now not only the borders between companies are blurred but that markets are increasingly being used within companies instead of command and control procedures. Then, we will attempt to suggest a few ways in which the corporate governance of these companies may evolve.

Knowledge disperse companies

In 1994, the Sloan School of Management at MIT started a research and education program called “Inventing the Organizations of the XXIth Century”, one of its main goals was to develop scenarios of possible future organizations. The initiative was not intended to be predictive, it just tried to envision alternative future ways to organize work and the architecture of companies in the arriving century.

Among other products of this initiative one was the paper “Two Scenarios for 21st Century Organizations: Shifting Networks of Small Firms or All-Encompassing ‘Virtual Countries’?” (Laubacher et al, 1997), where the authors imagine one possible way of organizing businesses as “performed by autonomous teams of one to ten people, set up as independent contractors or small firms, linked by networks, coming together in temporary combinations for various projects, and dissolving once the work is done”. As examples of this possible future trend they submit the film industry, textile production in the Prato region in Italy, Semco, a Sao Paulo based diversified conglomerate reputed for its extreme decentralized organization, and the radical outsourcing in producing goods such as athletic shoes, computer displays and software.

The second scenario is the all-encompassing globalized company which meets all the needs of their employees from cradle to grave and operate in almost every industry almost replacing “countries” as the icon of allegiance. Employees would not introduce themselves as being “Japanese” or “American” but as members of Toyota, Sony or General Electric. “Employees own the firms in which they work, through pension plans, stock options, employee participation contracts, and other vehicles. And just as the modern nation states ultimately turned to democracy, many of the corporations of the twenty-first century have moved to representative governance”.

The first of the scenarios may be developing now, among other manifestations of the trend, through what is now called “crowdsourcing” (Howe, 2008), which is basically looking outside the corporation towards the community of fans, customers, or basically anyone in order to organize and develop some of the tasks facing the corporation. These tasks may go from R&D (Innocentive: <http://www.innocentive.com/>; NineSigma: <http://www.ninesigma.com/>, Dell’s IdeaStorm: <http://www.ideastorm.com/>)¹, to software development (Linux: <http://www.linux.org/>; TopCoder: <http://www.topcoder.com/>)²; to advertisement development (there are several tournaments at YouTube to create ads for several different corporations); to product design (Threadless: <http://www.threadless.com/?=>).

The new business concept is very much based on Hayek’s seminal article “The use of knowledge in Society” (1945) where the author affirms that the nature of the problem economic theory wants to solve in order to build a rational economic order is the fact that the knowledge of the circumstances that need to be taken into account is never concentrated in a single mind but is dispersed among individuals in incomplete and often contradictory form. As the specific circumstances of “time and place” are impossible to transmit in a cost effective way, the need to empower the individual “in the spot” through a decentralized system of decisions becomes relevant to allow such information to be considered. But it is not only those particular circumstances that are needed for a well coordinated system of decisions, the man on the spot needs information about what the others are doing, both consumers and suppliers, information that she gets in an abbreviated form through the price system.

¹ InnoCentive describes itself in the following way: “InnoCentive is a global, online marketplace where organizations in need of innovation—companies, academic institutions, public sector, and non-profit organizations—can utilize a global network of over 160,000 of the world’s brightest problem solvers.”. NineSigma: “NineSigma enables clients to source innovative ideas, technologies, products and services from outside their organizations quickly and inexpensively by connecting them to the best innovators and solution providers from around the world. Our unique “Discover-Connect-Solve” approach is based upon the principles of Open Innovation. Our clients access the largest and most comprehensive open network of scientific researchers in the world to solve their business needs.”

² TopCoder describes itself as: “TopCoder is the first massively parallel, non-labor based end-to-end solution for the development of all things digital. No matter how big or small the project, from requirements discovery to design, build and test for applications ranging from small web, mobile and internal departmental apps to large ERP, CRM and decision support development and implementation, TopCoder is a platform that provides instant access to a vast wealth of resource”.

This “spontaneous order” then succeeds in incorporating the dispersed knowledge to play a role in the coordination of activities in the marketplace. Hayek describes it as a gigantic telecommunications system.

The globalized company

But this article will concentrate on the second prototype of the corporation, the globalized company. We can now find several ingredients of markets “within” the companies. The principle of performance pay is quite similar as the way the market compensates a successful satisfaction of consumer’s needs. Also, as companies decentralize and organize themselves into profits or investment centers the relations between these units raise the issue of pricing products and services going from one to another within the same company.

As the role of information has become more important, and new technological advances have revolutionized the way knowledge could be obtained, companies are experimenting in many different ways not only how to tap the dispersed knowledge within the “community” outside its specific borders, but also over how to use the knowledge that is dispersed within their own organizations. They are asking themselves the same question Hayek raised, and answering it developing market mechanisms.

Jensen & Meckling,(1992), picked up the issue several decades later:

“But the internal organization of the capitalist firm is also an instance of the absence of alienable decision rights. Indeed, we distinguish activities within the firm from activities between the firm and the rest of the world by whether alienability is transferred to agents along with the decision rights. In this view transfers of decision rights without the right to alienate those rights are intra-firm transactions. While firms can sell assets, workers in firms generally do not receive the rights to alienate their position or any other assets or decision rights under their control. They cannot pocket the proceeds. This means there is no automatic decentralized process which tends to ensure that there is no automatic decentralized process which tends to ensure that decision rights in the firm migrate to the agents that have the specific knowledge relevant to their exercise, and that there is no automatic performance measurement and reward system that motivates agents to

use their decision rights in the interest of the organization. Explicit managerial direction and the creation of mechanisms to substitute for alienability is required.”

Actually, managers have taken this late advice and are designing market-like mechanisms “with” alienability, not without it. Take the case of the creation of a market in “talent” (Bryan et al, 2006). The authors point out that most companies allocate decision rights through personal connections or transactions within limited groups. In a large corporation, how do they know where the most talented people for a specific position are? Supposedly senior managers or human-resources departments know it, but as the Hayekian argument would tell us, much information is lost, particularly the local and specific information about a certain human resource. There may be reports, or data bases, but the particular “circumstances” are not going to be there. IT development can certainly improve the search of information, and proposals in this direction have been presented by Idinopulos & Kempner (2003) and Agrawal et al (2003), but the problem is not one of technology but of the use of information that is already available, though dispersed.

That is why they promote the formalization of “talent marketplaces”. How would they work?

“First of all, any marketplace must define what is being traded, how it is priced, and the operating protocols and standards. To facilitate exchanges, a formal talent marketplace also needs ‘market makers’: usually central human-resources staff in the case of managers, or staff assigned to help a format network executive (who might head, say, a center for software design) in the case of specialized professional talent.” (Bryan et al, 2006).

The description of the marketplace is not much different from how a traditional market “outside” the company works: positions required are posted on a website with confidentiality, with a description and all usual specifications related to location, compensation, duration. Will this mean that the company will be encouraging an internal competition that will eventually damage it, since different profit centers will compete among them raising the cost of labor? Actually yes, that is one of the consequences, but such a competition is already present with other employers, or is the result of a personal decision

by a higher ranking manager. The mechanism will make sure that the human resource will be allocated to where it is most valued within the company and compensation may go up as much as any unit is willing to pay for it. Of course, in the presence of limited duration contracts that must be respected the agent will only be able to enter the marketplace for a position after she has completed the present contract.

Bryan et al reject competition through prices, or salaries because the “objective of business, is to maximize profits per worker rather than wages per worker”, but that is inconsistent with their support of a market for talent. As mentioned, the competition already exists with other employers, and if internal employers are not allowed to compete through prices they are going to compete through other fringe benefits or amenities which will eventually be as costly as a higher salary, although the authors believe competition will be only based on the nature of the assignments, opportunities for growth, duration and personal contacts the position offers, which is beyond doubt. Besides, profit centers will be looking at their own returns and will not make a deal if it is not considered a good one.

Information may even be more complete than in regular markets. Internal employers will not only have access to resumes or any other information posted or sent in by candidates, but also all formal evaluations available within the company.

A similar proposal has been made with regard to a market in knowledge (Bryan 2004). Raising the Hayekian problem of the use of dispersed knowledge Bryan points out three ways in which companies have tried to manage it: big investment in document-management systems with the hope that employees will eventually use them, distribution from the top which is not altogether useless since best-practices or new products can be reported from the top down and letting the organizational units solve their own knowledge problems. The third, a decentralized way, works but the localized solutions multiply standards and protocols and lack the second component of the price system: the distribution of information.

The solution may lie in the institutionalization of an internal market in knowledge. The knowledge to be traded must be “distinctive”, in opposition to “common” knowledge which, by definition, is available to all, and must be in a form that allows its exchange. That is, it must become “formal” knowledge or a “knowledge object”. Consistent with the proposal on a talent market considered before, the author disregards money as one side of the exchanges to take place in the market for knowledge, and proposes instead a

reward structure based on recognition, pay and promotion in order to incentive those with the knowledge to offer it. In one way or the other, that is through payments or rewards, intellectual property rights must be considered, though an internal market for knowledge does not necessarily have to mimic a patent system, a General Public License may be in order.

Futures markets and predictive markets

Future markets give us the best estimates that we can have at a certain moment with regard to a future event, since they take into account the information and expectations of all market participants. Nevertheless, is that correct? What kind of information do future prices give to us? Spot sales and purchases report us on the degree of scarcity or surplus in a market at a certain time, but future prices are “visions” or “opinions” on what the situation could be at a future date. Can we, therefore, say that the aggregated opinion of many, as reflected in a price, gives us better information? Is it not better the information an “expert” may have? Majorities can make mistakes and they usually do. For centuries they thought the Earth was the center of the Universe until an “expert”, such as Copernicus, showed them it was not so (Surowiecki, 2004).

Prediction markets, also called “information markets”, are specifically organized markets where contracts with payoffs tied to a certain future event are traded by participants. As with any other market, this trading leads to a market price that can be interpreted as the aggregated forecast of all participants.

There are already many of these markets, though probably the most researched is the Iowa Electronic Markets at the University of Iowa. Markets are organized for the sale and purchase of contracts based, among others, the results of future elections, the performance of some economic indicator, FED decisions on interest rates, the impact of flu or coming hurricanes. The market is (Berg, et al, 2001) defined as that organized with the goal to profit from the informational content in market valuations in order to make predictions over future events. In these markets, the price of contracts is dependent on those events and, therefore, they give information on their probability.

The utility of these markets is related to the information they give to decision making. As an example, predictive markets could help political parties to select candidates

looking at their “quotations” in these markets. In 1996, the Republican party selected Robert Dole as a candidate, a weak rival against Bill Clinton, but predictive markets were signaling, instead, that Colin Powell could have been a more powerful rival.

Of course, the same kind of information is usually collected by polls, but polls are answered by anyone. In these markets, since there are gains and losses to make, it is expected that only those with more accurate information will participate.

Media entertainment companies make regular use of predictive markets, and they can anticipate future revenues and adjust their marketing campaigns. They do it through the Hollywood Exchange Market (www.hsx.com), where one can find markets for the revenues of a certain film in the first six months after release, or six weeks, or weekly for the ten most important already released. In 2002 the HSX selected 35 of the eventual 40 winners of the Oscar prize.

Comments Hal Varian (2003):

“Most political questions involve a combination of facts and values. One example might be: Does global warming exist and, if so, what should we do about it? The first question is about facts; the second is about values.

Or consider a narrower economic question: What would be the impact on tax revenue of a cut in the dividend tax rate, and should we enact such a cut? There is presumably a factual answer to the first question, while the second depends on the value one puts on who gains and who loses from such a tax.

There is no shortage of experts who will opine on the impact of global warming or dividend tax cuts, but it is often difficult for a nonexpert to evaluate their judgments.

Whom should you believe? How can a decision maker -- or a voter -- appropriately weigh all those expert opinions?

Economists believe financial markets do a pretty good job of aggregating information in part because they offer strong incentives to those who make good predictions. Prices of oil futures contracts predict future spot prices well because traders who make better predictions can make a lot of money.”

And Vernon Smith in his Nobel Lecture (2002, p. 519):

“What evidence do we have that the laboratory efficiency properties of continuous double auction trading apply also in the field? One of the best sources of evidence, I believe, is found in the Iowa Electronic Market (IEM) used widely around the

world. (Forsythe, *et al.*, 1992, 1999) These markets are used to study the efficacy of futures markets in aggregating widely dispersed information on the outcomes of political elections, or any well defined extra laboratory event, such as a change in the discount rate by the FED. The 'laboratory' is the internet. The 'subjects' are all who log on and buy an initial portfolio of claims on the final event outcomes; they consist of whom ever logs in, and are not any kind of representative or 'scientific' sample as in the polls with which they are paired. The institution is the open book double auction."

Predictive markets within companies

Since predictive markets can be developed to get accurate forecasts over any future event, it is not strange that they have started to be used within companies, since they certainly need good forecasts not only on the economic situation in general but on their own product and services' markets.

Companies like Microsoft, Eli Lilly, Google and Hewlett-Packard are already using these markets in one way or another. The idea is to tap the great amount of knowledge that is dispersed within the many people working at these companies.

Charles Plott from the California Institute of Technology and Kai-Yut Chen from the Hewlett-Packard Research Lab designed an experiment, a market through which managers of different divisions would buy and sell bonds related to the expected increase of sales for the coming year. They could buy a bond for an increase of 1-2%, another for 3-4%, or for 5-6% and on. During certain time of the day managers could enter the marketplace and buy and sell bonds, which eventually led to a "market price" reflecting the aggregate evaluation on a sales forecast. Six of the eight events as this that were organized showed more accurate results for markets than the traditional process of aggregation of information within the company, usually meetings and reports from different units to a hierarchical top where the information is collected and a general forecast is defined.

Eli Lilly organized an experiment with 50 employees from the R&D area asking them to buy and sell bonds representing the market chances for new drugs under development. The market predicted correctly three of the most successful. "Intel used a market to make a coordination decision: which factories should produce computer chips and when. In the experiment, a centralized, strategic plan was replaced with a market in

which salesmen and a plant manager traded future contracts representing chips. The result was nearly 100% efficiency in allocating manufacturing capacity. That experiment echoed another, real-life market triumph. In 1998 oil giant BP set out to reduce company-wide greenhouse emissions 10%. Instead of issuing plant-by-plant dictums, the company let plant managers trade permits to produce emissions. Managers who could quickly get their plants into compliance and reduce emissions even further could sell their permits to other plants. BP hit its reduction target – nine years early.” (Kiviat, 2004)

Chan et al (2002) did the same for marketing research. They used bonds trading in order to measure preferences over new product concepts, in spite of the usual focus groups, concept tests or conjoint studies. The participants received an initial portfolio of cash and virtual stocks, they were also provided with detailed information on the products (and their corresponding stocks) including specifications, images and multimedia illustrations. Participants made trading decisions as they would do in a stock market: assessing the values of the stocks, selling those overvalued and buying those undervalued. While doing that they were essentially voting on the forecasted value of the underlying products, and the price of the stock becomes an index of the product's consumer value. The experiment was made on nine concept bike pumps and then with eight crossover vehicles (part SUV, part minivan, part luxury car), including, in the case of the cars, three existing products (Lexus, Mercedes and BMW) and five to be released (Pontiac, Acura, Buick, Audi and Toyota).

Internal markets

Markets, as knowledge aggregation devices, are not only extending but they are also growing within companies. The entrepreneur not only has to evaluate each employee but also, as long as his company grows, will have to do the same with different divisions: business units, profit or investment centers. Such evaluation has basically two goals: to determine in what measure each business unit is contributing to generate value for the company; and to incentive the group to achieve whatever goals are selected.

In order to do this, the entrepreneur or manager faces the problem of how the relations and exchanges among the different units and between these and the general management will be. Each company has a certain structure of production, a process

through which certain resources are turned into products or services. Some will certainly be “core” activities, while others will support these. “Core” may include the purchase of inputs, processing, packaging, sales and post-sale services; services may include legal, accounting, human resources, maintenance, public affairs and others.

The manager or businessman will try to achieve the goals before mentioned with each of his business units. In order to do this, each input going to a business unit or the product or service coming out of it must have a certain measurable value: a price. This means we are going to find a certain price structure “within” the company.

Economic calculation is what the entrepreneur must do, but she needs prices since otherwise, how could she do it? Production Unit A buys fruits and converts them into marmalade; which goes into unit B where they are packaged in glass recipients; going to unit C where they are packaged into cardboard boxes to be distributed by unit D. The entrepreneur must know that at the end of the process she gets a profit, good enough to continue with the process. But she does not know how much of it comes from each unit, or how much do any of them lose.

She could have such information, for example, adding up the costs generated at each stage, but she would still have to allocate general and fixed charges. The price of an intermediate product or service is a cost for the unit receiving it and revenue for that sending it, in both cases it is a price. And as in the external market, these prices are an essential incentive guiding the production process and indicating to each unit how much to produce in order to get as much value as possible.

“The problem is an important one, because the prices which are set on internal transfers affect the level of activity within divisions, the rate of return on investment by which each division is judged, and the total profit that is achieved by the firm as a whole” (Hirshleifer, 1956)

If the entrepreneur takes only into account unit’s costs she cannot achieve the abovementioned goals. Let’s see this through a simple example: a single production unit transfers a product to a sales unit which puts it in the market:

Production
0 300

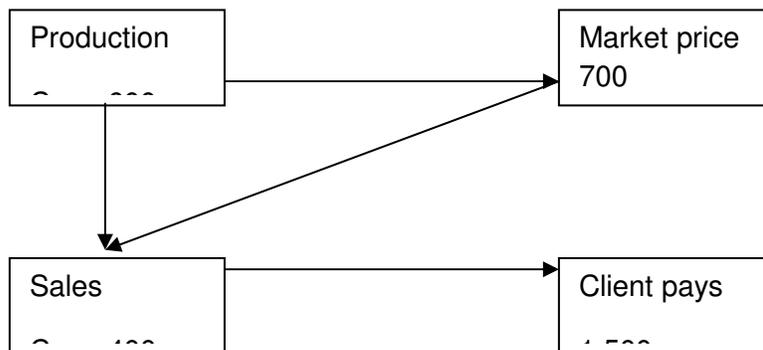
Sales
0 100

Client pays
1 500



The production unit has a marginal cost, that is, of producing one additional unit, of 600, and the sales unit, of 400; total cost is 1,000, and a sale of 1,500 produces a total profit of 500. How do we evaluate who generated more value and how do we incentive them? If we base our decision on costs, Production gets 60% and Sales 40%, but are they contributing in such proportion? Furthermore, are we not giving them an incentive to generate more costs in order to have a larger proportion? Paradoxically, we would be unleashing a competition among them to see who is more “inefficient”.

On the contrary, if we now introduce “internal prices”, and these reflect market prices, we will have such information and we will generate the right incentives.



In this case there is a market Price. The Production Unit can sell the intermediate product to the external market for 700 and get a profit of 100. The Sales Unit can buy the intermediate product to Production at 700 and then complete the process to have it ready for sale at a cost of 400; its total costs are 1,100 and its profit is 400. That is Production gets 20% of profits and Sales 80%.

This is a very different situation. The entrepreneur now knows the contribution margin for the Sales Unit is much higher than the one of the Production Unit, signaling something must be done with this late one or that the comparative advantage lies with marketing and sales. On the other hand, if each unit gets a retribution linked to its own generation of value, they will be incentive to increase it.

When transfers between units are made at market prices, they will reflect better their real economic contribution to the total profits of the company. As long as the Production Unit is able to compete with external production, it will always be better to get

the supply from them, and Production will also prefer to sale internally, giving it an additional margin of competitiveness saving Coase's "transaction costs" (including sales taxes).

This turns most companies into a set of business units with "market-like" relations between them. There is not much difference from the coordination the *impannatori* do with the textile producers in the Prato region in Italy, although this is not meant to say that such a direction is not needed.

The future of corporate governance

If companies, at least with respect to the use of knowledge, are evolving in such direction, how will their corporate governance be affected? Laubacher et al (1997) imagine it in the following way:

"Employees own the firms in which they work, through pension plans, stock options, employee participation contracts, and other vehicles. And just as the modern nation states ultimately turned to democracy, many of the corporations of the twenty-first century have moved to representative governance. Our firm is one where employee-shareholders have the right to elect the management of the company, not just the board of directors, but managers at almost every level throughout the organization. Decisions are made hierarchically, but every year, on election day, we choose from slates of managers who vow to do the best job for the company as a whole. Since our livelihoods depend on the choice, nearly all of us take advantage of the keiretsu's 'open books' financial reports, which provide a constantly-updated overview of the business's priorities and assets.

Some people think of the system as paternalistic and bureaucratic. But actually, there is very little 'fat' in the system. Nepotism, ossified command structures, and sinecures don't last long, since everyone benefits from improved performance. Specialist 'organization designers' travel through the massive alliances, brokering partnerships and helping make sure that people communicate effectively across boundaries. All of us tend to get along, because our companies attract people who agree with the prevailing attitudes. We all know the "Shell/Daewoo way", and we live and die according to it."

Such scenario is possible, although considering all *Public Choice* has already said with regard to the functioning of democracies, and looking at the populist slogans or the campaign expenses of the modern democracies one has to wonder whether such arrangement will be efficient enough to survive in the competition of the marketplace. It is, certainly, incomplete, but it may give us a good start to consider ideas that, by its nature, must only be speculative.

Actually, once all employees become shareholders there may not be a need to regular elections since they can express their preference by selling at any time. The election of a new management could be sparked by the fall in the price of stock below a certain level, but taking into account how stock prices are affected by an economic policy situation way beyond the management's reach, more sophisticated indicators should be devised: for example a certain percentage deviation from the industry's stock index, allowing then to filter the general economic conditions.

A futures or "predictive" market on the possibilities of the price of stock reaching such "trigger" clause could probably give advance information on the aggregate evaluation all employees may have on the performance of top managers and whether the strategies they are following or the policies they are implementing will keep them at their jobs or will take them to the electoral test.

But the assumption that only employees own the firm is limited. Besides, if they do it through their pension funds the decision to buy and sell will be made by them, and it will not reflect the specific knowledge the employees may have. Certainly, the pension funds play an important role in CG by setting up the standard of "best practices", and it will probably still be important that a certain percentage of the company's capital is owned by outsiders of the firms since their decisions to buy and sell transmit the market perspective on the future performance of the firm.

Therefore, if employees are not going to be the sole owners a new way should be considered in order to elicit their knowledge, meaning, a new or separate market. Outside shareholders may be willing to set up a specific kind of shares, employees' shares or rights to regular stock that may trade in a specific market, allowing them to reach that information. And they may have a chance to participate at the "predictive" market themselves.

A number of issues arise: should the employees receive the same amount of shares or different as part of their compensation packages? What will the role of the Board be?

It certainly looks like information technology will push or allow companies to move in the direction of more democracy, although rather than “representative democracy”, the present model where shareholders elect Board members, it will be “direct democracy”, where shareholders elect managers directly or even decide strategic issues. It cannot reach the point where most of the decisions are taken through polls; one of the main problems of direct democracy is that it asks voters to decide on very complex issues which they would not be able to grasp without professional training and sophisticated information. Defenders reply that it is because they will have to decide that they will get informed but definitely voters cannot get the expertise managers have, that is where the Board gets a role.

But the advantage of predictive markets is that it does not rely on votes, and even less on “one person, one vote”, but people “putting their money where their mouth is”, a much stronger incentive to be informed and use your local knowledge.

The real evolution of firms and their corporate governance structures will certainly be different than this, we cannot anticipate what the ingenuity of institutional entrepreneurs will bring to us, but at least we can play with some ideas and speculations. That is what entrepreneurs do, only that they bet on them.

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