Original Article

Could corporate governance practices enhance social welfare?

Omar O. Chisari
is an Economist and a Research Professor specialized in applied computable general equilibrium models to study microeconomic policies (for example, regulatory adjustments and macroeconomic shocks) in uncertain environments.

Gustavo Ferro
is an Economist and a Research Professor at Instituto de Economía UADE and CONICET dedicated to efficiency and productivity analysis in regulated markets.

Javier A. Maquieyra
is an Economist working on computable general equilibrium models at Departamento de Economía UADE.

ABSTRACT The purpose of the article is to contribute to the quantitative evaluation of economy–wide corporate governance reforms. In the literature quantitative studies on this issue are not common. The computable general equilibrium (CGE) approach offers useful insights, which complement a partial equilibrium (firm level) analysis. In this study, corporate governance is assumed to be costly for those firms that implement it and we model it as an additional cost with spill–over on the rest of the economy through the price system. The model is simulated using 2006 macroeconomic data for Argentina. An additional internal audit body is required of firms implementing corporate governance (public firms) in the country. Auditors are thus the direct recipient of those costs and they provide the possibility of proxy corporate governance incremental expenses for public firms. Simulations assume different scenarios and potential benefits from corporate governance are considered too. The article models potential benefits in terms of reduced cost of capital and simulates various scenarios where: (1) there are no benefits, (2) cost of capital is reduced (permanently), (3) the reduction is temporary and (4) the volatility of the cost of capital is reduced.

INTRODUCTION

A wave of mergers and acquisitions occurred in the United States in the 1980s and in Europe in the 1990s that changed the landscape of greater public corporations. Governments fueled great changes in management practices for different reasons. During the 2000s, corporate scandals like Enron, WorldCom, Tyco, Adelphia, Global Crossing, among others, triggered normative and regulatory changes in the United States, the most famous being the Sarbanes–Oxley Act ('SOX') in 2002. In response, and acknowledging the interconnections with global capital

Correspondence: Omar O. Chisari
Instituto de Economía UADE, and CONICET,
Lima 717, (1073), Buenos Aires, Argentina
E-mail: ochisari@uade.edu.ar

markets, these measures extended to the rest of the world. Many transnational emerging market firms (with headquarters in the United States) or local firms that chose to be listed in the capital markets of developed countries adhered to the new practices. The new rules put in place obligations for directors, managers, accountants and auditors, defined their responsibilities and those of the directors and officers in general, established new penalties for malfeasance and demanded more reports and red tape. Consequently, resources from firms and society as a whole had to be invested in new costly controls and the potential net gains (or losses) had to be evaluated.

For many reasons, the corporate governance discussion is still relevant today. The global wave of privatizations has been an important phenomenon in Latin America, Eastern Europe, Asia and the former Soviet Union. Better practices of corporate governance work to protect foreign investment for individuals and institutional investors. In addition, the financial assets in the hands of institutional investors have grown considerably, and international organizations and forums have subsequently begun to treat the issue as a way to avoid future financial crises.

Corporate governance could be defined as a system of institutions and mechanisms that boosts incentives for public firms, reducing the discretion related to the stakeholders' participation in the profits within a context of asymmetric information and incomplete contracts. Those institutions and mechanisms are built to reduce conflicts of interest. If they succeed, the risk to the firm's investors and creditors is capped, thus reducing the firm's cost of capital. Claessens (2006) points out that better corporate governance practices benefit firms through improved access to financing by lowering the cost of capital and offering shareholders a more favorable treatment. 'Corporate governance good practices' as a concept has to do with public firms listing on a stock exchange, but the notion could be extended to private firms, state-owned enterprises and non-profit organizations.

A 'partial equilibrium' or a 'firm-level' view of 'good practices' targets all those procedures that reduce risk to creditors and shareholders. Yet, that reduction implies costs for the firms under study and probably for the rest of society. Resources must be devoted to increasing controls, auditing, and so on (Zhang, 2005). Part of these costs could be passed through to other markets or be met by other productive sectors or consumers that demand goods that are 'corporate governance-intensive'. The 'general equilibrium' view is a complementary perspective to address the social impact of new corporate governance (that is, on the whole set of stakeholders). Although 'good practices' could decrease the risk to the firm's financiers, they could impose additional costs on the whole of society (Chisari and Ferro, 2009).

But the corporate governance mechanisms also redistribute income. If conflicts exist between minority and majority shareholders (as can be seen in countries where capital is concentrated) or between shareholders and managers (in countries with atomized capital), then the implementation of 'good practices' (as conceived in the 'partial equilibrium' view) improves the relative situation of the weaker party.

In this article we calculate net gains and trace the distributive consequences of introducing more demanding standards of corporate governance in a specific economy.

The implementation of corporate governance firm-level good practices is, therefore, subject to a social cost-benefit analysis. The approach is the same as a social investment project: spend today to reap the fruits in the future, considering the pecuniary externalities of the project. 'Good practices' of corporate governance intend to reduce asymmetric information between firms going public and their financiers to secure that all stakeholders receive their share of the firm's results. How costly are the mechanisms used to redistribute the information rents for society? The implicit assumption in most of the literature is that they are negligible, or that they are overwhelmingly outweighed by the benefits.

In fact, the implementation of corporate governance is costly, even at the firm level.

We ask whether such costs are beneficial to society as a whole. Higher costs are easy to see; future and conditional benefits are not. To obtain the necessary figures for our exercise, we focused on some quantifiable elements to exemplify and summarize the problem.

We employ a recursive dynamic general equilibrium model to try to evaluate the cost–benefit of the implementation of new practices in a specific economy. They are costly but have some expected benefits (for example, a decrease in the cost of capital due to fraud control, a limit on abuses of minority shareholders, less discretion of the managers, and better quantity and quality of information disclosure).

After this introduction, the next section briefly synthesizes the context in which we develop our exercise. In the subsequent section we present our methodology. We develop the model in the later section, present the simulations in the fifth section and discuss the results in the last section. Finally, the last section concludes.

THE CASE UNDER STUDY

Corporate governance is related to information failures: one part (that is, managers in an atomized shareholder environment, majority shareholders in a concentrated property ambience, and so on) can confiscate wealth from other stakeholders. The risk of these events increases financing costs. Expensive screening and signaling mechanisms try to solve the asymmetric information problem. For example, a regulation that puts more responsibility on directors and managers, making them subject to fines or prison in case of abuse, or the introduction of a new mandatory Audit Committee composed of independent directors for public firms (not previously in place) can help with the information problem and cap risks for investors and creditors. But those mechanisms are costly for the firms and society as a whole (because of the dead weight losses of the regulations). Also, some sectors could unexpectedly benefit from the regulations. Hence, we will examine whether expected gains justify the cost of corporate governance.

Our 'laboratory' is a medium-sized South American economy with a limited stock capitalization. A recent reform mandates that public firms hire an Audit Committee composed of independent directors. Private firms are exempted. Said Audit Committee is our proxy to Corporate Governance costs since it is quantifiable. Some reforms are qualitative, very conjectural or not easily measurable, for example, new penalties for directors because of insider trading practices or the obligation to include a proportion of independent directors on the board. Of course, this is a simplification but we are concerned with illustrating the potential use of the methodology for rational and informed social decisions on corporate governance. We have a limited approximation of the real cost of going public, which involves more decisions concerning information disclosure (for instance, quarterly and not annual balance sheets for private firms), more disciplined tax behavior, and so on. Public firms are generally more exposed than private companies. Exposure means less discretion for managers and majority shareholders (control groups), stricter regulatory and tax compliance, more expectations of the social responsibility of the firm, among others.

Argentina has a small market, low capitalization, scarce transactions, few listed firms, and a stock market that has declined in recent decades as a resource to find finance in the country.[1] Many firms have recently de-listed locally and chosen to list in foreign markets. CEF (2005) examines the property structure and the quality of the country's corporate governance of public enterprises. Bebczuk (2005) analyzes the empirical evidence concerning past and expected results compared with qualitative indexes of good corporate governance. The property pattern shows that half of the public firms are family owned and the rest are transnational companies. In both cases, capital is concentrated in the control group and there are no atomized-capital companies. The number of independent directors generally amounts to the minimum stipulated in the regulation.

Important changes in property and control have taken place during the past two decades.

Some local families have sold their companies to international capitals. Many of the largest firms have begun to quote abroad. Some firms have chosen to de-list and go private. Institutional investors, created in the 1990s to manage private pension funds, were key shareholders in the main public companies; however, these were nationalized in 2008 and their holdings are currently in state-run social security administration hands.

In recent years, some new regulations on corporate governance were adopted. In particular, Decree 677/01 made two important innovations: It assigned new duties to directors and enforced responsibilities with heavier penalties. Directors are engaged with loyalty and diligence, the interests of all the shareholders being the principal focus. They must abstain from personal benefits, should control the independence of the auditors, and should establish internal controls to ensure a prudent management and reduce possible conflicts of interest.

The Decree was regulated by Resolution 400/02 of the Securities Commission (CNV), which allocated new functions to the Audit Committee. This is integrated by three or more members of the Board of Directors. They are appointed by the Board and should have expertise in accountancy, finance and management. Their main activities are to supervise the risk control activities, to evaluate the financial reporting process, to monitor the internal control system, to review the internal audit plan, to advise on the internal auditor nomination (including the assessment of its independence, review its plan and evaluate its performance). The Audit Committee was incorporated in 2000 to parallel a pre-existing body (The Monitoring Council enacted in 1972).

The body of knowledge on corporate governance costs is not very extensive. See IDEA (2004).

METHODOLOGY: THE CGE MODEL AND SIMULATIONS

We conducted a computational simulation applying better practices in corporate governance in Argentina using a dynamic computable general equilibrium (CGE) model. It is a quantitative representation of equilibrium conditions at an aggregate level in all of the economy's markets where behavior hypotheses about producers and consumers are modeled (and a diversity of policies could be evaluated, as reported by Carlstrom and Fuerst, 1997, and Bourguignon and Ferreira, 2003). Social Accounting Matrixes (SAM) are their main input, listing expenditure in columns and receipts in rows for households, firms, government and the rest of the world (Shoven and Whalley, 1992).

Our sample is based on firms with the potential to 'go public'. The universe of firms considered were those (i) organized as corporations ('*sociedades anónimas*', limited liabilities firms which issue shares); (ii) currently listed on stock markets (locally or abroad) or not publicly quoted; and (iii) comprising large- and medium-sized companies ('large' and 'medium-sized' relative to the local context). Taking a traditional local ranking by the business magazine *Mercado* (in decreasing order by capitalization), we identify the universe covering the three above items for 2006. We separate private (PRI) from public firms (PUB) in the universe. The sample is composed of 415 large firms and 4000 medium-sized firms. We cap our sample to the 415 large plus 2500 medium firms which can potentially afford 'to go public'. Why that cap? First, the local exchange used to list 550 firms in the 1960s; second, in Brazil the local exchange was successful at incorporating a special panel of small- and medium-sized enterprises by limiting duties on corporate governance; and third, the Australian exchange counted with over 1900 firms listed and an economy that is twice the size of Argentina's. We designate the sample as POT (Potentially Public) to differentiate the firms from the PRI universe.

Local regulations distinguish listed and unlisted corporations. The former have to present quarterly balance sheets, must spend on an Audit Committee of independent members (obligation that is not mandatory for private companies), and, in general, are more exposed

to information disclosure duties and scrutiny by the tax agency. The decision to go public involves a set of new explicit and implicit costs for the firm. Since some of those costs are not easy to quantify, we proxy the costs of going public by the cost of the Audit Committee that PUB companies face.

We simulate various scenarios with different benefits attached to those costs. The POT firms are not equally distributed across all sectors of the economy; the degree of firm concentration in some sectors is higher, so the incidence of the decision to go public (that is, defraying the cost of an Audit Committee) is lighter. In addition, one sector of the economy sells (as an input for other sectors) the auditing services carried out by the Audit Committees ('Sector 25'). Note that the Audit Committee partly overlaps with the role of the Monitoring Council in corporations. Moreover, both PUB and PRI companies routinely employ external audit services. Private companies also need auditing services for contracting purposes, for monitoring and for private borrowing. Indeed, a firm going public has the extra cost proxy by the Audit Committee, which does not occur in PRI firms.

Note also that Argentina has experienced long periods of high inflation, some episodes of hyperinflation and lacks indexed instruments. In the past, medium- and long-term credit was dollar-denominated. Since 2001, when the country entered in default, local financial markets have become thin and firms tend to finance from retained profits to a higher degree than in countries with a similar level of development. PUB firms generally have easier access to credit, to bond issuing and to foreign loans, while PRI firms depend more on retained profits and on short-term bank loans. In times of economic instability, banks cut their credit lines and PRI firms suffer credit shortage.

Finally, another difference between PRI and PUB companies is their perception of tax compliance. Informally, PBU firms are believed to be more exposed to tax enforcement mechanisms. This hypothesis goes beyond this article; yet, the perceptions affect small- and medium-sized firms' decisions to go public.

We constructed a sample of POT firms that can possibly go public (that is, to convert from a PRI into PUB) and charged them with the support of an Audit Committee to proxy the costs of going public. The cost of supporting the Audit Committee mandated by law for PUB companies differs for small- and medium-sized POT firms.

The audit provider sector uses all inputs that are specific to the sector (reflecting the specificity of the human capital allocated to that task). PUB and PRI outputs have four possible destinations: intermediate consumption, final consumption, investment and exports

In the sample, 'large' enterprises are those whose annual sales surpassed AR\$ 50 million (US\$ 16 million) in 2006, the year the model was calibrated. 'Medium-sized' enterprises in the sample comprise those whose annual sales reached between AR\$ 10 million and 50 million (US\$ 3.3 million to 16 million) in 2006.

After that, the firms were classified by activities among the SAM. For 'large' POT firms an additional auditing cost of AR\$ 0.6 million (US\$ 0.2 million) was imputed, while the additional cost totaled AR\$ 0.3 million (US\$ 0.1 million) for 'medium-sized' POT firms. Those figures were surveyed in the market (for the year 2006) as a proxy of the cost of an Audit Committee integrated by three independent directors. Before 2006, the same sources informed that external auditing services had not increased since the Decree 677/01. The costs of listing on the Buenos Aires Stock Exchange are mostly fixed, having an incidence only at the beginning of the process. Indemnity D&O insurance is relatively cheap since the coverage is lower than in developed countries. The local market does not cover bad faith, and white glove felonies are not punished with the same severity as in Anglo–Saxon countries.

Why is CGE useful here? Costs and benefits are not evenly distributed since the potentially public firms are more concentrated in sectors with larger firms and costs also depend on the quantity of firms which adopt the standards, this being subject to the concentration of firms in each sector. The model distributes costs in each sector, computes their incidence and can trace spreading. Also, the redistributive effects depend on the initial distribution of property rights of the firms affected by the reform. The model also allows us to distribute the expenses and the gains over time. As only some of the expenses and gains are quantifiable, we concentrate on a cost we can measure and on its probable consequences.

We assume a fixed cost for auditing (AR\$ 0.2 million for large firms and AR\$ 0.1 million for medium firms).[2] This assumption of fixed cost results in different relative production costs for different industries given that the total cost per industry will vary. The variation in the cost in each industry is due to the different levels of industry concentration: for example, the Agriculture sector has more firms than Mining. Also, the sample is not regularly distributed in different productive sectors: retail commerce is relatively atomized compared with chemical or rubber products. Thus, there are fewer POT firms in the former than in the latter.

THE MODEL

Let us now focus on a simplified version of the model to highlight the basic elements of its structure.

Domestic agents

Let us consider an economy with one representative agent, whose utility function depends on domestic tradable goods c, services and non-tradable goods a, imported goods m and bonds held by households b^h, labor supply L^s, and investment goods, I^d:

$$u(c, a, m, b^h, L^s, I^d). \qquad (1)$$

The budget constraint of the domestic agent can be written as:

$$p_T(1 + t)\, c + p_m^*(1 + t_m) m + p_{NT}(1 + t_a) a + p_b b^h + p_I I^d$$
$$= w L^s + \eta(\pi_T + r K_{MT} + r_T K_T)$$
$$+ \theta(\pi_{NT} + r K_{MNT} + r_{NT} K_{NT}) \qquad (2)$$

While w represents wages, π_T and π_{NT} are benefits in the industries producing goods and services, respectively. Parameters η and θ represent shares of domestic agents in profits of each one of those sectors ($0 < \eta, \theta < 1$), and, for the sake of simplification, we also assume that the participation in capital (specific and mobile) ownership coincides with them (the rest of the world retains the complementary shares). K_T and K_{NT} are specific capital of tradable and non-tradable sectors, respectively; instead, K_M is capital freely mobile between sectors. Taxes paid are represented as t, t_a and t_m (the model includes other taxes, for example, on profits, not shown here. Although I^d in expression (1) enters in the utility function directly, it is possible to include Q-investment functions (making investments a function of r, r_T, r_{NT} and prices of investment goods) or specific investments to remedy or anticipate shocks.

Tradable goods

The production functions of tradable domestic goods c and exports x in terms of capital and employment are given by:

$$x + q_T = F(L_T, K_T, K_{MT}). \qquad (3)$$

Profits of the tradable industry are given by:

$$\pi_T = p_T q_T + (1 - t_x)\, p * x - p_{NT} a_{NT}$$
$$-(w L_T + r_T K_T + r K_{MT})(1 + t_{VT}) \qquad (4)$$

In this expression $p_{NT} a_{NT}$ are the expenditures in non-tradable goods (inputs in fixed coefficients), t_x are export taxes, and t_{VT} corresponds to VAT and other taxes on value added.

Non-tradable goods and services

The respective analog equations for the production function of non-tradable goods and services are the following:

$$q_{NT} = G(L_{NT}, K_{NT}, K_{MNT}). \qquad (5)$$

Profits of the tradable industry are given by:

$$\pi_{NT} = p_{NT} q_{NT} - p_T a_{NT} \\ - (w L_{NT} + r_{NT} K_{NT} + r K_{MNT})(1 + t_{VNT}) \qquad (6)$$

In this expression q is total production, $p_T a_{TN}$ are the expenditures in tradable goods (inputs in fixed coefficients), t_x are export taxes, and t_{VT} corresponds to VAT and other taxes on value added.

Investment goods

Investment goods are produced using tradable, imported goods and services. The VAT is not applicable in most cases for those goods and in some cases special exemptions can be applied for imported capital goods. They are taken into account in the specific models of the countries. For the sake of simplicity, we assume that they are produced using only tradable goods.

Public sector

The public sector has a budget constraint given by:

$$w L^G + p_b b^G + p_I I^G = (w L_T + r_T K_T + r K_{MT}) t_{VT} \\ + (w L_{NT} + r_{NT} K_{NT} + r K_{MNT}) t_{VNT} \\ + p_T tc + p_m^* t_m m + p_{NT} t_a a + p_b b^0. \qquad (7)$$

The right-hand side represents tax revenue, including export taxes and bonds sales. The left-hand side represents the purchases of labor and bonds (so that there is a net position in bonds). Note that we assume that the government is not actively participating in the markets for goods or services, although that does not occur in the general model. In this simplified case, the government collects taxes and uses the proceeds to hire workers and repay domestic debt in the hands of domestic agents (the general model includes investments and government consumption).

External balance

Note that in this version, the external sector neither buys domestic bonds nor sells bonds to domestic agents. Given these assumptions, we can obtain a balanced current account as:

$$p^* x = p_m^* m + (1 - \eta)(\pi_T + r K_{MT} + r_T K_T) \\ + (1 - \theta)(\pi_{NT} + r K_{MNT} + r_{NT} K_{NT}). \qquad (8)$$

Market equilibrium conditions

The above expressions include the implicit assumption of equilibrium in markets for specific and mobile capital, as well as for the export market. Additional market equilibrium conditions require:

$$a + a_{NT} = q_{NT}. \qquad (9)$$

$$c + x I^d + I^G + a_{TN} = q_T. \qquad (10)$$

As regards the labor market, the presence of unemployment implies in most cases that:

$$L_T + L_{NT} + L^G \leqslant L^s, \qquad (11)$$

and

$$w \geqslant w^0, \qquad (12)$$

where w^0 is a minimum wage constraint (in the case of this model we assume that it is indexed to prices so that real wages are constant). On several occasions the solution implies (9) as an equality, for example when the population growth falls below job creation due to rapid accumulation of capital per capita. So, w is determined as the rest of the prices of the economy via market forces.

Growth

There are three sources of growth in the model: technological progress (disembodied), net investments and population growth (at a constant rate). Net additions of (mobile) capital are given by private and public investments, net of depreciation of installed capital: $\Delta K_M = I^d + I^G - \delta \ (K_T + K_{NT} + K_M)$, where δ is the rate of depreciation of capital.

Simulations

The growth in expenses in auditing are represented as an increase in the coefficients a_{Taudit} and a_{Naudit}, which represent the demand for auditing by the tradable and non-tradable industries. A reduction in the cost of capital is equivalent to a reduction of p_I relative to the rest of the goods of the economy.

Data and calibration

The model is based on 2006 data[3] with a baseline growth of an annual 4 per cent as reference. There are two kinds of agents in the model: producers and consumers. Productive sectors are divided into various sub-sectors. Our CGE model has all the basic properties of the Walrasian perspective and is numerically solved using GAMS/MPSGE.

Relative prices and the mobility of resources can explain why certain industries and technologies expand or contract. Therefore, in the model, production is neither mandatory nor inevitable; it is determined by market forces and relative prices.

For every period, prices are computed to simultaneously clear all markets. The model used is a recursive dynamic model that simulates growth for the economy. It is not a model of optimal growth; instead, agents make savings decisions in period t using information for only that same period; savings are used in the following period $t+1$ as additional capital. This new capital is not specific by sector but malleable and is fully mobile between sectors of production. Therefore, it is allocated at the same time as the prices that are being determined by the model; the final allocation of 'brand-new' capital responds endogenously to the relative profit opportunities and it is reallocated until the reward to new capital is the same in all industries. Henceforth, the final industrial scale depends on market incentives determined by the model itself.[4]

On the supply side, the production function in each sector is a Leontief function between value-added and intermediate inputs: one output unit requires an x per cent of an aggregate of productive factors (labor, physical capital, financial capital and land) and $(1-x)$ per cent of intermediate inputs. The intermediate inputs function as a Leontief function of all goods, which are strict complements in production. Instead, value-added is a Cobb-Douglas function of productive factors.

Regarding factor endowment, both types of capital are fully employed, while there is labor unemployment. Wages are assumed to be fixed in real terms. The modeling of unemployment is quite important for the case of Argentina. The full-employment assumption could modify the cost/benefit evaluation. Increased labor demand in full-employment models leads to higher real wages; but in models with unemployment, real wages remain constant until unemployment disappears and the labor shortage increases real wages.

Financial capital and labor are perfectly mobile while physical capital is sector specific, involving some cost between sectors for the first two factors and a sector specific cost for the last factor.

The demand side is modeled through 10 representative households, a government and

an external sector. Households buy or sell bonds, invest and consume in constant proportions (Cobb-Douglas) given the remuneration for the factors they own (and the transfers from the government). The choice of the optimal proportion of the consumption good is obtained from a nested production function in the utility function through a cost minimization process. The government is represented as an agent that participates in markets for investments, consumes and makes transfers to households, and has a Cobb-Douglas utility function; its main source of income is tax collection (though it also makes financial transactions through the bonds account). The external sector buys domestic exports and sells imports, makes transactions of bonds, and collects dividends from investments.

Taxes are applied on imports, value added, factors, households and exports. Government expenditures consist of transfers to households, purchases of bonds, public investment and public consumption. The demand for public consumption is directed to sectors 26, 27, 28 and 29 of the economy (public administration, defense, social security, education, health and other social services).

Households are modeled through 10 representative agents used as a reference for income classification. The first decile is the poorest and the 10th the richest.

Each household earns income from the sale of its productive factors (formal and informal labor, non-salaried labor, mobile and specific capital), and from transfers. Income from bond sales is exclusive to the five richest deciles. Transfers go to the five poorest deciles. We assume a small country; so, prices of tradable goods are considered as a given. The rest of the world's agents own local assets and reap the corresponding dividends. They also invest in mobile capital and compute investment projects outside their economy. Thus, reforms in corporate government can be interpreted as beneficial to them (the rest of the world's agents) and lead to reductions in the required risk premium.

SIMULATIONS

Table 1 quantifies the effect on each sector's costs of the sample of POT, simulating they are going public. The cost increases refer to higher expenses in auditing services, an industry that is intensive in formal labor and capital.

Cost increase for going public varies dramatically across industries. To understand why, consider the intersection of two dimensions: the atomization of the sector (an atomized sector has more firms than a concentrated one) and the presence of more or fewer POT firms in each sector. A concentrated sector with a scarce number of POT is less affected by the cost increases than – at the other extreme – an atomized sector composed of some POT firms.

The timing of the decision to go public is presented in Figure 1: T_0 represents the moment when the firms have to decide to go public. At that moment they have 'partial equilibrium' knowledge of the costs and expected benefits. At T_1 firms incur costs related to the accomplishment of corporate governance standards; at the moment, costs can change due to general equilibrium effects (since many firms behaving alike could increase the price of auditing). At T_2 firms collect the net benefits and gains and losses are distributed in the economy.

Thus, firms have to decide *ex ante* if the expected benefits – at present value – exceed certain costs. Such a decision is private and depends on the firm's own evaluation. However, for society as a whole the costs could exceed private ones (because of the shortage of skilled auditors) or could limit benefits (if the firms fail to differentiate from the private ones and the cost of capital remains high).

Four simulations were run for the model; the counterfactual is the *status quo* or baseline scenario:

(a) The economy pays the additional expenses required for higher corporate governance standards (that is, establishing the Audit Committee) but there are no gains in terms of cost of capital.

Table 1: Cost increase by sector

| Sector	Sector	Increase (%)
Agriculture, cattle breeding, hunting, forestation, and fishing	1	8.89
Mining	2	3.04
Food, tobacco, and beverage manufacturing	3	7.59
Textile industry	4	7.59
Leather	5	7.59
Timber, except furniture	6	7.59
Paper	7	7.59
Editing, printing, and recording	8	7.59
Coke factoring, oil refining, and nuclear combustible	9	6.35
Chemical products	10	6.35
Rubber and plastic	11	6.35
Other non-metallic minerals	12	6.35
Metals	13	6.35
Metal products, except machinery and equipment	14	6.35
Machinery and equipment	15	7.59
Automobiles	16	7.59
Furniture and other manufactory	17	6.35
Electricity, gas, and water	18	5.14
Construction	19	4.14
Commerce	20	1.13
Hotels and restaurants	21	1.13
Transportation and related activities	22	2.01
Mail and telecommunications	23	2.01
Financial intermediation, insurance, and voluntary pension plans	24	2.66
Real estate, audit services, other services	25	2.66
Public administration and defense. Mandatory social security	26	0.00
Teaching	27	0.47
Social and health services	28	0.47
Other community, social and personal services. Domestic services.	29	0.47

Source: Own compilation.
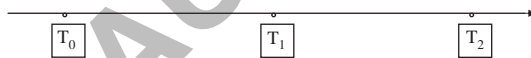
Figure 1: The timing of the decision to go public.

(b) The cost of capital falls 1 per cent permanently since the adoption of the standards by the POT firms. The reduction in the cost of capital is effective only after the eighth year of the reform.

(c) The economy pays the expenses but the gains in the cost of capital appear before

and do not last; this could be the case of a scenario in which several other countries are undertaking the reform and can, therefore, only temporarily outperform each other.

(d) The capital cost is reduced as a result of a change in corporate governance practices of the firm sample, but it is supposedly volatile. Developing countries must tackle high and volatile interest rates, which creates uncertainty and increases the option value to wait before investing.

RESULTS

Table 2 summarizes the quantitative results of the simulations. The baseline (*status quo*) assumes a GDP growth rate of 4 per cent per year with an annual growth rate in the welfare of the poorer households at 3.96 per cent and 3.8 per cent for the richer ones, respectively. Departing from a 100 GDP level for Year 1, the economy reaches 137.74 in Year 10. As a consequence of different growth rates in the economic sectors (Primary, Manufactures, Services) and of the different social groups (here divided between the richer half of households with a majority of the physical and human capital and the poorer ones that are less skilled and endowed), in 10 years we can expect the primary sector to grow 42.26 per cent, the manufactures sector 42.88 per cent, the service sector 37.51 per cent, the welfare of the richer 37.97 per cent, and the welfare of the poorer 37.86 per cent. In the baseline case the different paths of the economy assume that the money otherwise targeting the additional auditing of public firms targets capital accumulation. Since it is reallocated to auditing when the sample of firms goes public, the growth rates decelerate. Without a compensation of some sort (say, a decrease in the average cost of capital or in its volatility), the economy will accumulate less capital and the growth rate will decrease. The size of the impact depends on deep parameters of the economy. Among them are the structural input-output

Table 2: Results of the simulations: baseline and alternative scenarios

Variables	Baseline (status quo) (%)	Scenario A (%)	Scenario B (%)	Scenario C (%)	Scenario D (%)
GDP Annual Growth Rate Year 1	4.00	3.46	3.46	3.46	3.48
GDP Primary Sector Annual Growth Rate Year 1	3.89	3.87	3.87	3.87	3.87
GDP Manufactures Sector Annual Growth Rate Year 1	4.39	3.70	3.70	3.70	3.71
GDP Service Sector Annual Growth Rate Year 1	3.89	3.59	3.59	3.59	3.60
Annual Growth Rate Welfare Richer Households Year 1	3.80	3.36	3.36	3.36	3.36
Annual Growth Rate Welfare Poorer Households Year 1	3.96	3.39	3.39	3.39	3.39
GDP Growth Accumulated at Year 10	39.74	39.54	39.98	40.45	39.31
GDP Primary Sector Growth Accumulated at Year 10	42.26	42.49	43.07	43.89	42.19
GDP Manufactures Sector Growth Accumulated at Year 10	42.88	42.57	42.93	43.47	42.38
GDP Service Sector Growth Accumulated at Year 10	37.51	37.68	38.03	38.41	37.50
Welfare Growth for Richer Households Accumulated at Year 10	37.97	37.86	38.08	38.75	37.62
Welfare Growth for Poorer Households Accumulated at Year 10	37.86	37.71	38.30	38.41	37.52

The departing levels of GDP, GDP Primary, Manufactures, Services, Richer Households' Welfare and Poorer Households' Welfare=100 at Year 1.

Source: Own calculations.

coefficients and, in particular, the supply elasticity of the auditing sector and the mechanics of wage adjustment under unemployment. In the case of the supply elasticity of the auditing sector, the model takes the information of the industry as a given. It is assumed that there is an elasticity of substitution equal to one between formal labor, specific capital of the sector and mobile capital (assumed to be in the 12 per cent of the sector's total capital, on the average of the whole economy). With regard to wage adjustment, it is assumed that they are constant in real terms, that is, adjusted to the consumers' price index of the economy (until full employment is reached and the market forces determine the wage rate). This assumption is important since additional costs imply higher prices and subsequent increases in wage rates, which in turn aggravate unemployment.

With respect to the sensitivity of the results and their robustness, the most important factor is the interaction of the growth rate on the workings of the labor market. The simulated economy presents unemployment for the benchmark year. However, unemployment tends to zero and disappears at the fourth year of the simulations because GDP growth exceeds population growth; at that moment, the wage rate begins to grow (owing to the scarcity of labor). The increase in wages impacts on the costs of going public (adopting corporate governance standards) because the scarcity of skilled labor raises the cost of auditing services. If the rate of growth is assumed to be lower, the breakeven year (when unemployment becomes zero) will be postponed. That is, if economic growth were lower, more time would be needed to eliminate the initial unemployment rate and the auditing services prices would not rise in the short term.

Scenario A

The POT firms pay the expenses but do not obtain any reduction in the cost of capital. The direct expenses reach 0.13 per cent of GDP yearly. The main assumed alternative use of those expenses in auditing is capital formation,

which explains part of the decline though it is milder for Year 10 (the GDP in the 10th year is 0.2 per cent lower than in the *status quo* scenario). The GDP growth rate decreases 0.54 per cent in the first year. Because the capital/output ratio is 3, then a 0.13-per cent decrease in capital accumulation falls by more than three times the GDP growth rate. The manufactures sector is most affected since it includes more POT firms than the other sectors. Also, the cost of the reform is distributed evenly between the rich and poor deciles. The former are the main recipients of the rents of capital (they pay the audit expenses), while workers experience the diminished capital accumulation in the form of lower salaries.

Scenario B

Initial losses are reverted at the end of the period when the cost of capital drops 1 per cent yearly. From Year 9 on, gains surpass losses. As Table 1 shows, benefits are larger for rich deciles, which face greater investment expenses. Why wait until Year 8 to reap the gains of better corporate governance standards? Because it is the way we find to model the high implicit discount rate of the firms, which consider the benefits of going public 'too far and too limited'. The GDP level as a whole by sector and by income distribution bracket is higher in the 10th year than in the baseline scenario or in Scenario A. There are gains for implementing the reform in the future. Note that in this scenario, as well as in all the cases considered, the initial losses are quite similar but are offset when the dynamics are taken into account.

Scenario C

Here, gains already appear in the third year of the reform but they are temporary and last only five years. The underlying reason could be the following: if the reform is imitated by other economies competing in the global allocation of capital flows, the differences in the cost of capital could be temporary. Nevertheless, despite the initial losses, the anticipated

gains have a favorable impact, and the effect of the cost of capital reductions generates a persistent affect on economic growth because of the accumulation of mobile capital. Compared with the former scenarios, the results of the reform are even better in the 10th year. Afterwards, the results tend to converge since the decrease in the cost of capital is transient. But since those years are too far off in terms of present value, they dilute in the long run.

Scenario D

The capital cost is reduced as a result of a change in corporate governance practices of the firm sample, but it is supposedly volatile. The initial volatility is modeled as the ups and downs (starting with an up) of the cost of capital equivalent to 1 per cent (as a deviation from a mean of zero volatility). Scenario D yields a result which is worse than Scenario A (reforms without gains) and, therefore, the reduction of volatility should be considered as important as the lowering of the average capital cost.

CONCLUDING REMARKS AND MAIN LESSONS

Corporate governance could be defined as a system of institutions and mechanisms that induce incentives for public firms, reducing the discretion of the stakeholders' participation in the profits within a context of asymmetric information and incomplete contracts. Those institutions and mechanisms are constructed to reduce conflicts of interest. If they succeed, the risk to the firm's investors and creditors is capped. This implies a lower cost of capital and more capital accumulation (*ceteris paribus*), which in turn means quicker economic growth.

We employ a dynamic general equilibrium model to try to evaluate the cost-benefit of these practices in a specific economy. We conducted an empirical application of better practices in corporate governance in Argentina using a dynamic CGE model. Our 'laboratory' is a country with a small market, low capitalization, scarce transactions, few listed firms

and a stock exchange which has declined in importance over recent decades. We constructed a sample of firms that can possibly go public. The sample was built with firms that could defray the costs of an Audit Committee – mandatory for public firms in the country – as a proxy of costly extra auditing services but not mandatory for private firms. We divided the sample into large- and medium-sized enterprises and the increased costs were assigned to them. We later simulate the different possible impacts of the reform

The purpose of the article is to contribute to the quantitative evaluation of economy-wide corporate governance reforms. In the literature quantitative studies on this issue are not common. The CGE approach offers useful insights that complement a partial equilibrium (firm level) analysis.

Of course, the results depend on the structural characteristics of the economy and the design of the scenarios. Yet, the main lesson is that costs are not negligible, either in absolute or relative terms (when compared with the results of traditional evaluations of the costs of distortions created by tax increases in CGE models). In brief, according to our findings:

1. The reform is costly for the case at hand basically because the economy is diverting resources from capital accumulation to extra audit expenses. Even when the resources to provide an Audit Committee to all potentially public firms are 0.13 per cent of GDP, the decrease in capital formation of that amount implies a 0.54 per cent decrease in GDP growth (the ratio capital/output is in the vicinity of 3) for the first year.
2. If the reform succeeds at reducing the capital cost – even modestly – in the long run (Scenario B), the results in the growth rate will be different than in the *status quo* and in Scenario A: corporate governance pays.
3. Better results are yielded in the case of the rapid recovery of the increased expenses, even if the gains are transient (Scenario C).

4. Volatility in the cost of capital has negative effects even when the mean of the cost of capital can be reduced with the adoption of corporate governance standards across the economy.

ACKNOWLEDGEMENTS

NOTES

1 In 1960 the market comprised 550 public firms, a figure which dropped to 278 in 1978, 170 in 1991 and 130 in 1999. They now number 91 firms.

2 Total costs assumed to support the Audit Committee of POT firms (US$) = 0.2×415 + 0.1×2500 = $333 million or AR$ 1 billion. Total GDP = AR$ 780 billion. Ratio = 1/780 or 0.13 per cent. The estimates were obtained from personal interviews with experts on corporate governance and managers belonging to institutions in the Argentine corporate sector that represent the leading public firms in the country and are currently listed on the local exchange. The estimate of the cost of the Audit Committee is based on amounts actually paid (on average) in listed firms.

3 Initial GDP is AR$ 655 billion; imports account for AR$ 125 billion, so the global supply is AR$ 780 billion. Investment reaches AR$ 149 billion; consumption reaches AR$ 468 billion and exports AR$ 162 billion. Global demand (public plus private) totals AR$ 780 billion. Consumption represents 71 per cent of GDP; investment accounts for 23 per cent; exports are 24 per cent and imports 19 per cent. Government revenues (taxes) are 28 per cent of GDP. Private savings amounts to AR$ 137 billion while public savings is AR$ 15 billion.

   The Gini coefficient is 0.48. Value added comprises 42 per cent of domestic fixed capital, 36 per cent formal labor, 6 per cent informal labor and 16 per cent non-salaried labor.

   Government revenues are mostly derived from VAT (AR$ 50 billion), direct taxes on households (AR$ 23 billion), taxes on exports (AR$ 12 billion), among others. Government expenditures include public consumption (AR$ 81 billion), transfers to households (AR$ 62 billion) and public investment (AR$ 14 billion). The fiscal surplus is AR$ 25 billion.

4 The dynamic model was calibrated for total GDP of the economy growing at 4 per cent for 2006, leaving aside exogenous shocks identified for the economy in 2006. The simulations assume that the labor force is not growing; this is a neutral assumption taking into account that what matters are the comparative dynamics of the basic scenario of growth with respect to the simulated cases.

REFERENCES

Bebczuk, R. (2005) *Corporate Governance and Ownership: Measurement and Impact on Corporate Performance in Argentina.* XLI Congreso Anual Asociación Argentina de Economía Política (AAEP). La Plata.

Bourguignon, F. and Ferreira, F. (2003) Ex ante evaluation of policy reforms using behavioral models. In: F. Bourguignon and L. Pereira da Silva (eds.) *Techniques and Tools for Evaluating the Poverty Impact of Economic Policies.* Washington DC: World Bank and Oxford University Press.

Carlstrom, C. and Fuerst, T. (1997) Agency costs, net worth, and business fluctuations: A computable general equilibrium analysis. *The American Economic Review* 87(5): 893–910.

CEF. (2005) El gobierno corporativo en Argentina. *Nota de Política # 5.* Centro para la Estabilidad Financiera. Buenos Aires, July.

Chisari, O. and Ferro, G. (2009) Gains and losses of adopting new standards of corporate governance. A CGE analysis for the case of Argentina. In: T.G. Arun and J. Turner (eds.) *Corporate Governance and Development. Reform, Financial System and Legal Framework.* London: Edward Elgar Publishers, May.

Claessens, S. (2006) Corporate governance and development. *World Bank Research Observer* 21(1): 91–122.

IDEA. (2004) *Workshop sobre Comité de Auditoria*. Buenos Aires, Argentina: Instituto para el Desarrollo Empresarial de la Argentina, April.

Shoven, J. and Whalley, J. (1992) *Applying General Equilibrium*. New York: Cambridge University Press.

Zhang, I.X. (2005) Economic consequences of the Sarbanes-Oxley Act of 2002. William E. Simon Graduate School of Business Administration, University of Rochester.