

A Social Welfare Evaluation of Adopting New Standards of Corporate Governance. A CGE Appraisal For the Case of Argentina^{1,2}.

Resumo: Estimativas recentes dos efeitos da adoção de práticas mais estritas de Governança Corporativa se referem basicamente a estudos econométricos com dados cruzados entre países que focalizam os ganhos em termos de crescimento. São estes estudos suficientemente convincentes? É necessário tomar em conta não somente os ganhos potenciais em termos do funcionamento do mercado de capitais, senão também a escassez de recursos e características estruturais de cada economia. Os custos poderiam bater com fatores inelásticos e consumidores e não necessariamente com os acionistas. Por exemplo, práticas de reformas de Governança Corporativa poderiam ser intensivas em capital humano e possivelmente poderiam implicar que os ganhos esperados sejam maiores que as compensações por perdas no resto da economia. Mais ainda, o impacto das normas de governança corporativa em geral poderia ser negativo sobre pequenos negócios e influenciar a atividade econômica e distribuição de renda. Adicionalmente, novas regras (como a de Sarbanes-Oxley) poderiam ser colocadas acima das regras normais e já existentes, criando duplicação de custos. Este artigo explora estes temas utilizando um modelo de Equilíbrio Geral Computável aplicado à economia Argentina em 2003. Os custos estimados para a economia são da ordem de 0,23 a 0,39% do PIB. Nossas simulações sugerem que os custos e suas distribuições podem ter sido subestimados. Também estimamos reduções necessárias no custo do capital para compensar aqueles custos. Porém, nossos resultados sugerem que uma Governança Corporativa “Boa” deveria ser qualificada tomando em consideração o bem-estar social.

Palavras - chaves: Governança corporativo, equilíbrio geral computável.

Abstract: Current estimates of the effects of adopting stricter Corporate Governance practices refer basically to econometric cross-country studies that focus on gains in terms of growth. Are they convincing enough? It is necessary to take into account not only the potential gains in terms of the capital market workings, but also the scarcity of resources and structural characteristics of every economy. Costs could impinge upon inelastic factors and consumers, and not necessarily on shareholders. For example, corporate governance practice reforms could be human capital intensive and could possibly imply that the expected gains be more than offset by losses in the rest of the economy. Moreover, the impact of corporate governance standards established across-the-board could have negative impact on small businesses and could influence economic activity and income distribution. Additionally, new standards (like Sarbanes-Oxley's) could be added on top of normal and already existing standards, creating duplication of costs. This paper explores these issues using a Computable General Equilibrium model of the Argentine economy for 2003. Estimated costs for the economy are in the range of 0.23/0.39% of GDP. Our simulations suggest that costs and their distribution could have been underestimated. We also estimate necessary reductions in cost of capital to compensate those costs. But our results suggest that “Good” Corporate Governance should be qualified taking into account social welfare.

Keywords: Corporate Governance, Applied General Equilibrium.

JEL Classification: G34, D58.

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I Introduction

This paper discusses the cost/benefit analysis of corporate governance standards from the perspective of a Computable General Equilibrium Model (CGE).

Practices of corporate governance in use at the international level and in particular in the USA, have been presented as methods to facilitate the existence and functioning of capital markets and to allow the access of less developed countries to the world savings supply. It is expected that obtained said access, welfare will be improved, particularly via higher growth rates. Cross-country econometric studies are the evidence habitually supporting the idea. Here the intention is to examine more carefully those policy recommendations.

For a small open economy, both to trade and capital flows, cost of capital has an important exogenous component, depending on the rest of the world's evaluation of its economic and financial health. Therefore there are two relevant questions:

- Which are the general equilibrium costs of more demanding corporate governance practices?
- Which is the reduction of the cost of capital that is necessary to compensate for those additional costs?

It is known that the costs of actions and policies are passed through to the economy via the inter-industrial chain. Goods "intensive in corporate governance" will have higher prices, and therefore they will impinge upon the costs of industries that use them as inputs. Consumers will see different prices of consumption goods and for their endowments of production factors. Expansion and contraction of industries will also modify the intensity in the demand of capital and labour. Elasticity of substitution, mobility of factors and international prices will become key parameters for the determination of the final result on aggregated and individual welfare. Moreover, the public sector itself will see different levels of revenues from taxation.

Corporate governance costs in our CGE framework are treated as any other expense in an intermediate input. If an additional demand for audit services is man-

datory and required by regulation, it can be modelled as an increase in the corresponding input coefficient for every industry (analogous to a loss of efficiency in the use of an intermediate good).

If this intermediate good -services of audit and control- is produced by a specific industry, then the availability of resources and the elasticity of supply of factors that that sector uses (in particular educated labour) will be the relevant for the overall result.

Structural differences between economies will also become relevant to explain total net benefits and their distribution, and to understand why some societies are more enthusiastic than others to adopt stricter standards.

The present paper is organized as follows. Next section is devoted to discuss definitions of Corporate Governance, and to summarize recent developments in the world and in Argentina. The third section presents an overview of the CGE Model and the fourth section gives a general intuition of the workings of the model using a synthetic version of it. The fifth section summarizes the empirical experiments. The sixth section concludes with main lessons obtained.

II Definitions of Corporate Governance and Recent Development of the Issue

There are several definitions of Corporate Governance in the literature, but still there is no much clarity on what "good" corporate governance is. We think it is helpful to distinguish between the set of "available practices and standards" and a subset of "good practices and standards". The second one should include those practices that help to maximize (static or dynamic) welfare.

For OECD, Corporate Governance is the system of practices that controls and manages businesses corporations. Corporate Governance practices as a system make specific the distribution of rights and responsibilities between stakeholders. They detail rules and procedures for the decision process, and provide a framework for the determination of the objectives of a company (CEF, 2005).

Gutiérrez-Urtiaga (2004) defines Corporate Governance as the set of institutions

that determines how the residual claims are distributed between those who have participated in the generation of profits

Shleifer and Vishny (1996), in their well-known survey, argue that Corporate Governance is the form in which stakeholders make sure they will obtain a return of their investment. On the other hand, Fremond and Capaul (2002) emphasize that good Corporate Governance practices reduce the ex-post expropriation risk; thus the ex-ante cost of capital is also lowered. CEF (2005) emphasizes the agency perspective, stressing that Corporate Governance are the mechanisms which set the incentives that operate the companies, in order to protect the interests, assets, rights and liabilities of the different participants.

Our definition tries to conciliate all the previous concepts, which are not mutually exclusive. Hence, we will conceive *Corporate Governance as the available system of institutions or mechanisms that induce incentives in listed business firms, so as to distribute benefits between stakeholders, restricting discretion on such distribution (in a context of asymmetric information and incomplete contracts)*⁵. Those institutions and mechanisms are structured to solve conflicts of interests, and if this process is successful, risk faced by investors and creditors of the firm will be lower. "Good" Corporate Governance is defined as the subset of those practices that are welfare enhancing for the economy.

There are two basic Corporate Governance models (La Porta et al, 1998):

1) Outsiders' model, with spread capital and control by the market. It is the predominant model in the USA and in the United Kingdom. Its basic problem is the potential agency conflict between shareholders and the management.
2) Insiders' model, with concentrated ownership and control by relationships. It is predominant in the rest of the world. The main potential problem here is the interests' divergence between the group of control and minority shareholders, which could end in the expropriation of minority shareholders' rights.

The just mentioned agency problems can be counterbalanced by means of the fulfilment of suitable standards of Corporate

Governance and better quality of the legal framework. Many reforms are qualitative and therefore difficult to quantify; others have a direct relationship with current expenditures. Though benefits have to be compared against all costs, we focus on these costs. The results of incurring these costs will probably be privately appropriable in form of lower capital cost; but these will change the rate of profit, prices and the allocation of resources in the whole economy. Possibly, they will include improvements in the long-term growth rate.

The gains of good Corporate Governance have been analyzed, in quantitative terms, in econometric studies of cross section or simple models of partial equilibrium. In the first case, a regression imputes causalities and orients qualitative reforms; in the second one, the sector cases and principal-agents relationships are examined, without appreciating the shocks that spill towards other related sectors.

Instead, a general equilibrium perspective allows seeing how the gains and losses of different Corporate Governance standards spread via the habitual interchange relations.

Several reasons have accumulated in the recent years, making this issue more important:

- 1) Privatizations took place in the last two decades in developed countries and emerging economies.
- 2) Reforms of pensions and increasing of the contractual savings in many countries.
- 3) A wave of take-overs in the 1980s in English-spoken countries.
- 4) Deregulation and integration of the capital markets, stimulating investment in the whole world and creating a demand of better practices in order to secure the investments.
- 5) Asian crisis showed problems in the fast growth emerging economies.
- 6) Recent corporate scandals in the USA showed how the markets could be deceived with fake information.

The international tendencies of regulatory reforms on Corporate Governance issues could be grouped in two classes: "Soft Law"⁶, and stricter legislative reforms⁷.

With respect to the "Soft Law", the more remarkable issues for emerging econo-

⁵ Whereas the concept applies to firms listed in public markets, good practices are extensive to private business, or state own corporations, even to non-profit organisations.

⁶ Codes of good practices of Corporate Governance, promoted by government or international organisms such as Cadbury Report in UK, Winter Report of the European Commission, Principles of the OECD, etcetera.

⁷ Sarbanes-Oxley Act in the USA, Decree 677 in Argentina, etcetera.

mies are the “Principles” and the “Regional Round Tables” of the OECD (OECD, 2003 and 2004). The “Principles” were approved in 1999, becoming since then in an international reference. Five round tables were formed, Latin America, Russia, South Eastern Europe, Eastern Asia and Eurasia. There are “White Books” issued for each zone, corresponding to regional specifications.

Regarding stricter legislative reforms, the most influential norm at international level has been the Sarbanes-Oxley Act (SOX for brief), enacted in USA after significant corporative scandals at the beginning of the millennium. Its goal is to protect investors and to improve the exactitude and trustworthiness of the information that the listed firms are forced to disclose in fulfilment of the norms of public offer.

The fundamental points of SOX are:

- 1) Creation of the Public Company Accounting Oversight Board (PCAOB).
- 2) For firms, which provide audit services, other activities are forbidden to avoid conflicts of interest.
- 3) An audit committee of independent directors should exist in every board of all public societies.
- 4) “Section 302” certification for directors and executive members of the societies. It is over the annual or quarterly reports, taking responsibility of its content.
- 5) The Securities and Exchange Commission (SEC) can prohibit to anyone being manager or director of a public company.
- 6) More severe and explicit penalties to the insider trading.
- 7) New accountancy treatment of off-balance transactions and contingent liabilities (Rule 401a).
- 8) Strong jail penalties for destruction, alteration or falsification of accountancy and audit reports. More expanded terms of prescription of the offences and greater fines for business connected offences.

However, costs of implementation could be high. A growing literature tries to assess the cost of Sarbanes-Oxley ACT (SOX), namely Wallison (2005), Bergen (2005), Zhang (2005), Gifford and Howe (2004), and it could be mentioned a survey conducted on behalf of the “Big Four” auditor firms (CRA International, 2006).

Wallison (2005) asked whether the costs of the new preventive mechanisms do outweigh their benefits. The result for the legislation has been a substantial expense for companies, added liabilities for directors and accountants, and a number of other potentially significant intangible costs. One intangible benefit is said to be the improvement in investor confidence in the markets, and many companies note that they have found flaws in their internal control systems.

As measurable direct costs, Wallison (2005) estimates a one hundred percent rise in the costs for public companies for accounting and auditing. The Big Four raised their fees in an average of between 78 to 134% in 2004. Cost of Section 404 compliance, requiring to firms a testing of internal controls, and being considered *the key cost driver of SOX*, averaged US\$ 4.36 millions per company, following Wallison (2005). As indirect intangible costs, he identified impairment of corporate risk-taking, by empowering independent directors as a group. Management’s financial compensation and reputation is much more closely linked to earnings growth than that of directors. The market for director and officers insurance has hardened considerably, with effective limits on coverage, for example, “entity coverage” caps (Gifford and Howe, 2004).

Bergen (2005) tried to identify rises in costs affecting all the firms, which are attributable to SOX. The SEC estimated that the companies, collectively will spend US\$ 5.4 millions of additional working hours every year to comply with SOX, and an estimate of AMR Research placed in US\$ 6100 millions, the additional expenses in manpower, information technology and consulting services in 2004. Many costs are for once. Additionally, it could be diminished the risk taking and the innovation efforts of the firms. For small and medium size firms, the delisting rate tripled between 2003 and 2002. Delisting was aimed to lower the costs for these firms, averaging US\$ 0.5 million. There have been presumptions that firms with greater free cash flows and low quality accountancy chose delisting for sure. To lower costs, even the PCAOB and the SEC have suggested to auditors to tailor their procedures to the needs of every firm.

Zhang (2005) examined changes in market indices next to legislative events. Zhang found accumulative abnormal returns surrounding the events. Computed all the capitalization lost, it amounts US\$ 1.4 trillions. Zhang studied particular clauses and its implications in cross section and looked at the impact of the prohibition of non-audit activities for auditor firms, requirements on corporative duties, incentive payments and insider trading. It was also considered in the study the economic impact of Section 404 compliance. The events tested were 17, until the enactment of SOX, and 16 after that, including announcements, speeches and voting. There is no evidence of benefits on the stock prices. The evidence suggests that SOX or the message sent by its Congress treatment were bad news for the market.

The "Big Four"⁸ asked CRA International to review the cost of implementing Section 404 of SOX for a sample of the firms' Fortune 1000 clients⁹. Subsequently, there were included smaller companies¹⁰. Total proxy audit fees were US\$ 0.81 and 0.85 million for smaller firms, and US\$ 5.11 and 5.10 million for larger, in the years second and first respectively (CRA International, 2006).

Independent auditors attribute the total Section 404 cost declines primarily to efficiency gains as a result of the learning curve effect, and from first-year documentation efforts that did not need to be repeated in year two, according to CRA International (2006). The latter was the most important source of cost reductions. The number of material weaknesses and significant deficiencies identified by audits, declined from year one to year two.

In Argentina, the body of studies around corporate governance costs is of lesser extent. It can be mentioned IDEA (2004) and Reina (2005).

In the Argentine legislation, penalties imposed to independent directors, and high executives for malfeasance are up to AR\$ 1.5 millions¹¹. To preserve some executives, there are multinational companies with global policies, and in Argentina self-insurance via indemnity charters is common practice (IDEA, 2004).

The General Justice Surveillance Bureau (Inspección General de Justicia, IGJ) mandates since 2004 all directors to integrate a deposit after the company of AR\$ 10,000, a D&O (Directors and Officers) policy, or an insurance—cheaper than the former—, which protects the company but not the officer assets. In the whole Argentina market there are almost 85 policies, whose premiums are near AR\$ 39 million, protecting about 500 executives. Amounts insured go from AR\$ 3 to 150 millions (Reina 2005).

Apreda (2001) characterized local Corporate Governance before 1991:

- 1) During a century, the main domestic groups had been familiar firms. The financial resources were obtained from own banks or public banks.
- 2) Only directors pertaining to the control group were designated in boards. The CEO usually came from the founder family.
- 3) Almost all the firms established clauses in their charts in order to favour the control groups regarding their directors. Many familiar firms stopped quoting, affecting interests of minority shareholders. The takeovers were friendly most of the times. Scarce in-cash dividends were paid.
- 4) No firms issued bonds in capital markets in the whole period 1913-1990. They financed from internal sources, by loans and scarcely by new IPO. From 550 quoted firms in 1960, 103 are quoted nowadays. In most cases, the number of independent directors coincides with the minimum required by regulation.

An important change of property has been going on in Argentina since about a decade ago. Big companies, that used to be family properties, now belong to foreign groups and minority participation is in hands of institutional investors (mainly pension funds). CEF (2005) examined the structure of property and quality of the Corporate Governance of the public companies. Bebczuk (2005) analyzed empirical evidence of qualitative indices of corporate governance on companies' returns.

During the 1990s, the country adopted norms of Corporate Governance proper of countries with Common Law tradition. Since 2000, reforms have centred in the legislation of securities markets. The legal context

⁸ Following the collapse of Arthur Andersen, the bigger auditors at the international level are the "Big Four" Deloitte, KPMG, PricewaterhouseCoopers and Ernst&Young.

⁹ With market capitalization over US\$ 700 million.

¹⁰ With market capitalization between US\$ 75 and US\$ 700 million.

¹¹ AR \$ 3.10 = US \$ 1, at the end of September 2006.

only imposed general aspects, delegating the statutory details to the regulator (CNV, Comisión Nacional de Valores).

Decree 677/01 incorporated important changes: gave new responsibilities to directors, enacted provisions about the independence of directors and external auditors, and established penalties. The composition of the Audit Committee was also regulated. Three or more directory's members must integrate it, and the directory of the issuing society should define its designation. The Committee's member must have experience in accountancy, finance and business topics (Marsili *et al*, 2003).

III Computable General Equilibrium Model and Social Accounting Matrix

A Computable General Equilibrium Model (CGE) is a numeric representation of the conditions of equilibrium of the economy. Consumers are endowed with factors and goods, and their preferences are represented with CES utility functions; producers maximize profits hiring factors from consumers, and use their available technology to supply goods.

The CGE model uses the SAM as its database. A Social Accounting Matrix (SAM) is the most natural tool to present observed transactions for a defined period, since it represents all income and expenditure flows of aggregated agents considering in the model (Pyatt and Round, 1985). The model considered in this paper is Walrasian in its logic and it follows the general structure presented in Chisari *et al* (1999).

The solution of the model is obtained using the general equilibrium representation, and the mixed complementary approach. Ferris and Pang (1997) summarises applications to economies and firms. The model is constructed in a GAMS/MPSPGE environment, following the developments for Tom Rutherford. Brooke *et al* (1992) developed GAMS, and Rutherford (1999) discusses MPSPGE (Mathematical Programming System for General Equilibrium Analysis). Rutherford's software MPSPGE is based on Mathiesen (1985), which suggests that CGE models can be seen as Complementary Problems. They involve duality conditions between excess-

demand and prices, on one hand, and of net benefits per unit and activity levels, on the other hand.

In the model used in the simulations, households decide on consumption, investment, labour supply (labour/leisure decision) and portfolio composition. Those decisions are a result of a utility maximization.

Expenses are distributed into national, imported and investment goods. It is supposed imperfect substitution between imported and national consumption goods. In tradable-goods there is perfect substitution and in non-tradable there is imperfect substitution. Agents' budget constraint reflects total expenditure in goods and services, direct and indirect taxes and transfers between agents. Sources of income include labour income, capital payments and government transfers (unemployment subsidies, pensions, etcetera).

The government maximizes a general welfare utility function, which includes as its arguments the production of goods (public or private but of public provision), employment, and pensions. Pensions, servicing of the debt, investments and operating expenses are assumed a constant proportion on government income; the government budget constraint is given by the tax revenues and bond issues (net of capital and interests repayment).

Argentina is supposed to be a small country with respect to the rest of the world. The production of goods and services in the rest of the world is obtained from a production possibility frontier, with constant marginal rate of substitution (there is only one scarce factor abroad). The rest of the world is therefore represented with this production sector and with a consumer who receives all accrues of the foreign factor.

The current account deficit (or surplus) is compensated with financial capital movements, represented as purchases or sales of bonds of domestic and foreign agents.

Unemployment is admitted; real wages are indexed to the CPI of the economy. We distinguish to types of labour: formal and informal. The first group represents the registered labour (normally more educated), and the second one corresponds to less edu-



cated workers. In this model, it was assumed inelastic supply.

Physical capital is specific for each one of the sectors. Financial capital is perfectly mobile but has a very low substitution with the rest of the capital factors. New capital goods are not incorporated in current capital in use, and the analysis is then for the short run.

The CGE model is based on the Social Accounting Matrix for Argentina as of 2003. The model comprises 29 productive sectors, 10 income deciles/groups of consumers, government sector and the Rest of the World. There is an effort to integrate with the financial accounts of the economy. The Central Bank and the pension system are explicitly modelled as producers.

Sector 27 includes the industry that produces "audit services".

The participation of each decile in the consumption of the different goods and services, along with the compatibility of the SAM's sector, allowed the distribution of the consumption vector of the households, national as well as imported, between the different deciles. The government expenses are wages and salaries paid to government employees, purchases of goods and services, transfer payments and public debt services. This is all mainly financed by taxes, charged on firms and families. The deficit or surplus is the net saving of the public sector, which is covered with net bonds issuing.

IV The Model in a Principal-Agent Framework

Let us put the model in a very simple Principal-Agent framework very much used in the literature (see for example Varian (1992) and Burns (1996)).

The Principal's utility is the expected value of the difference between his expected incomes - generated by the Agent's effort, a , plus a random shock ϵ , which is normally distributed-, and the Agent's payoff -comprising a lump sum δ and a variable part γa . Then:

$$U_p = a - (\delta + \gamma a).$$

The Principal is assumed to be risk neutral, but Agent's utility is the difference between its income and its costs, which include a measure of the cost of its effort $c(a)$ and the cost due to the risk of the contract $rV_\epsilon \gamma^2/2$, where r represents the risk aversion degree and V_ϵ is the variance of the expected income. If U^0 indicates the outside utility option for the agent, the participation constraint requires:

$$U_a = \delta + \gamma a - c(a) - rV_\epsilon \gamma^2/2 \geq U^0$$

Then, the aggregate welfare (the Principal's plus the Agent's) will be given by:

$$W = a - (\delta + \gamma a) + [\delta + \gamma a - c(a) - rV_\epsilon \gamma^2/2]$$

In this expression the last term represents the cost due to distortions from the collection of funds to compensate the Agent's payoff.

In the First Best solution, the Agent is fully insured against risk ($\gamma = 0$), which in turn opens the possibility of *moral hazard*. The Second Best solution is found adding to the former problem the compatibility of incentives constraint:

$$\gamma = c'(a)$$

Let $c(a) = c \cdot a^2$ for example; then optimal γ is given by

$$\gamma = \frac{I}{(I + 4rV_\epsilon c)}.$$

It can be seen that the value of the effort incentive coefficient is smaller, the greater the r risk aversion coefficient is, the greater the associated risk to payoff V_ϵ is, and the greater the effort marginal cost is.

This redesign of incentives is due to the implicit assumption that "monitoring" and "cultural change or education on good practices" is too expensive or impossible. What does monitoring (or auditing) do?

Let us assume that monitoring expenses K help to reduce moral hazard, and assume that can be represented as a reduction of marginal costs of effort to agents. The problem of maximization of aggregate welfare could be written as:



Maximize

$$W = a - (\delta + \gamma a) + \left[\delta + \gamma a - c(a, K) - rV_e \gamma^2 / 2 \right] - K$$

Subject to

$$U_a = \delta + \gamma a - c(a, K) - rV_e \gamma^2 / 2 \geq U^0$$

$$\gamma = c'(a, K).$$

The variable K is now part of the control instruments. Hence, there will be an optimal K^* which yields the maximum welfare for the society. Increases in K will reduce c , and therefore it will be possible to increase γ and total effort. Let $c(a, K) = (c - K)a^2$ then optimal γ will be:

$$\gamma = \frac{1}{(1 + 4rV_e(c - K))}.$$

Alternatively, it could be conjectured that the risk premium required by agents would be lower if cost K is paid by the economy. In that case we will have $r(K)$. However, in emerging market r could be exogenous and not sensitive to changes in K . In our simulations we provide some estimates of needed reductions in cost of capital that will compensate for increases in auditing costs.

V The Model in a CGE Perspective

Let us put the model in a CGE perspective. Consider the case of only one domestic agent with utility function that depends on domestic goods and imported good consumption: $u(c, m)$. Equation (1) corresponds to the optimal condition of marginal rate of substitution equalized to relative prices, given by the price of the domestic good at international prices p^* and prices of imports p_m^* . Equation (2) is the budget constraint of the domestic agent, where w stands for wages, L^0 the endowment of labour, π and π_a for profits in the industry that produces the domestic good and in the industry that produces auditing services.

$$(1) \quad u_c / u_m = p^* / p_m^*$$

$$(2) \quad p^* c + p_m^* m = wL^0 + \pi + \pi_a.$$

Equation (3) gives the production of domestic good for consumption c or for exports x in terms of employment and capital (assumed in hands only of the rest of the world in this simplification, but not in the general model).

$$(3) \quad x + c = F(L, K).$$

Profits in the industry of consumption goods are given by:

$$(4) \quad \pi = p^*(x + c) - wL - r^*K - p_a a^d.$$

Where r^* indicates the international rate of interest and $p_a a^d$ are the expenses in auditing services, assumed to be in fixed coefficients α with total value added:

$$(5) \quad a^d = \alpha F(L, K).$$

Profits maximization requires¹²:

$$(6) \quad (p^* - \alpha p_a)F_K - r^* = 0,$$

$$(7) \quad (p^* - \alpha p_a)F_L - w = 0.$$

When levels of capital and labour used in production are determined optimally.

At the level of the industry that produces audit services, the corresponding equations of profit definition, optimal conditions and production function are:

$$(8) \quad \pi_a = p_a G(L_a) - wL_a,$$

$$(9) \quad a^s = G(L_a),$$

$$(10) \quad p_a G'(L_a) - w = 0;$$

Notice that it is assumed that the sector only uses labour to produce its services. In the general model we assume that there are different kinds of labour and that the sector uses qualified labour more intensively; moreover, the elasticity of substitution between factors is used as a parameter to explore sensitivity of to different assumptions on the supply of auditing services and scarcity of human capital.

We have also the familiar conditions of equilibrium in the labour market and in the auditing services market:

¹² In this synthetic version it is assumed that the degree of homogeneity of F and G is less than one; some factors of production are taken as given and not subject to optimization.



$$(11) \quad L_a + L = L^0,$$

$$(12) \quad a^d - a^s = 0.$$

From the former system, the current account equilibrium is obtained:

$$(13) \quad p^x x = p_m^* m + r^* K.$$

The general equilibrium model then explores the effect on domestic welfare of increasing α , and then how should r^* be reduced to obtain positive results in terms of GDP, rate of profit of domestic producers or welfare of individual deciles. It is also seen that profit rates of industries change in relative terms, which means that the incentives to invest in those sectors will change too.

So, for the macroeconomic experiments of compensation we use the following assumption:

$$r^* = f(\alpha; v)$$

$$f'(\alpha) < 0$$

That is, the cost of capital to the economy is sensitive to the expenses in audit services. The cost of capital depends also of a vector v of exogenous parameters.

It is interesting to think that companies could have already selected an optimal level of expenses in audit services (for example to control managers by shareholders or to give a signal to capital markets). In that case that level would have been obtained maximizing profits with respect to:

$$(14) \quad -dr^* / d\alpha - p_a F(L, K) = 0.$$

However, the regulatory authorities could consider that level insufficient, given spill over and macroeconomic effects and –like in the case of liquidity constraints for banks– impose a minimum level higher than the one chosen by companies.

The model used in simulations extends this presentation in several directions and includes inter-industry transactions as well as tradable and non-tradable sectors. Also it includes government and a detailed treatment of taxes and transfers, central bank intervention and financial markets opera-

tions. There are ten domestic consumers and a sector that represents the rest of the world. The empirical model was prepared for the Argentine economic and monetary authorities.

VI Simulations

Firms of the Argentine economy were classified as Public Firms (PUF) or Private Firms (PRF). Shares of PUF are quoted in local or multinational markets, where strict standard requirements of Corporate Governance are mandatory. A PRF has softer legal and regulatory obligations about information and auditing.

PUF are more intensive users of auditing services (internal and external) per unit of produced good than PRF. Such services of auditing will be used as proxy of the greater costs that are originated from the fulfilment of Corporate Governance standards. Many of these obligations are non-observable or non-quantifiable, but it is clear that there is a figure that approximates to the costs of Corporate Governance, which is related to the greater costs of internal and external auditing. In the simulation, these greater costs were approximated estimating the additional cost that great and medium size firms have to afford because the requirements of an Audit Committee in the board, obligation that PRF do not face. This cost is possibly the minimum of the differentials expenditures request to the PUF, but it is quantifiable number based on public information.

The PUF have a more intensive use of financial capital per unit of produced good than PRF, because in presence of credit rationing, it will firstly affect the more exposed and less audited firms. The major gain of good Corporate Governance will be a capital cost decrease, or the very access credit.

The PRF presumably has a less tax formality than the PUF, which by definition are more exposed and audited firms. Nevertheless, given the difficulty to consider the different tributary formality, a later study was let to explore this possibility.

The productive sector of auditing services uses all sector specific factors, intended to reflect the specificity of the human capital dedicated to this task. The goods



and services produced by PUF and PRF are allocated to the four possible destinies: intermediate consumption, final consumption, investment and exports. Whereas the auditing services have only one destiny: the intermediate consumption.

The impact of the addition of more demanding standards of Corporate Governance was explored constructing a sample of Argentine companies susceptible to adopt such practices, passing from PRF to PUF. Nowadays only about 100 firms are PUF in the Argentine capital market. An important part of them, are listed in fact in foreign markets. If the property of the companies is tracked, one half is family-owned companies and the other half multinationals, and there are not atomized capital companies in the Argentine market. (Bebczuk, 2005).

This exercise selected two kinds of firms that could afford the greater costs of auditing. The firms were divided in:

- 1) Big Size Firms, those with annual profits greater than AR\$ 50 millions (US\$ 16 millions).
- 2) Medium Size Firms, those with annual profits between AR\$ 10 and 50 millions (US\$ 3.3 to 16 millions)¹³.

Then, they were classified according SAM's activities. An audited cost of AR\$ 0.6 annual millions (US\$ 0.2 millions) was attributed to Big Size Firms, whereas for Medium Size Firms this cost is AR\$ 0.3 annual millions (US\$ 0.1 million). These amounts come from market sources, constituting a good proxy of the cost of an Audit Committee integrated

by three independent internal directors in the company. The same sources made notice that other over-costs of Corporate Governance improvement, possible to be consider, such as the external audit, have not had price increases after the implementation of Decree 677/01, which modified the regulations about Corporate Governance in Argentina. The costs of listing, determined by the Buenos Aires Stock Exchange, have a component almost totally fixed and an initial incidence at the beginning of quotation, so that were not considered. Finally, the indemnity insurance to directors is relatively cheap, since the coverage is low: in the Argentine case, it does not cover bad faith or wilful misconduct or serious damage. The local sentences to financial malfeasance do not have the severity of those in USA.

We considered three scenarios. The difference between them is the quantity of firms that hypothetically will become PUF. All the three scenarios include 415 Big Size Firms and a variable number of Medium Size Firms: 1000 (Scenario 1), 2500 (Scenario 2) and 4000 (Scenario 3).

Table 1 presents the results of simulations from Scenario 2 -considered the most plausible- because of the amount of firms involved. Two cases are studied: one with high elasticity of substitution between productive factors at the auditing sector, and other with low elasticity of substitution. The objective was to appraise the potential impact of the relative scarcity of skilled labour, of which "Financial" sector 27 is an intensive user.

¹³ The thresholds of the firms in use were defined by profits, since a private database was available including the universe of firms. It is reasonable to think that some firms of the universe could had had negative profits in the period the sample was collected. So the sample possibly is underestimating the number of firms to which extend the new standards, and the overall effects reached. But the lack of an alternative sample is an obstacle to explore another definition of the thresholds (for example, by revenue). The very absence of public companies with open financial statements is an obstacle to reach information for this kind of studies.

Table 1: Aggregated Results from Simulations (Scenario 2), and Exercises of Compensation

Variation in	Unemployment		Full Employment		Compensation Exercises (From D)		
	A	B	C	D	E	F	G
	Low Elasticity (0.25)	High Elasticity (1.25)	Low Elasticity (0.25)	High Elasticity (1.25)	1) Profit Rate of the Economy	2) GDP level at Constant Prices	3) Welfare of Most Affected Decile
First Decile Welfare	-0.20%	-0.33%	-0.15%	-0.15%	-0.05%	2.65%	0.63%
Second Decile Welfare	-0.25%	-0.38%	-0.21%	-0.20%	-0.11%	2.29%	0.49%
Third Decile Welfare	-0.30%	-0.43%	-0.27%	-0.25%	-0.17%	2.05%	0.39%
Fourth Decile Welfare	-0.27%	-0.41%	-0.25%	-0.24%	-0.16%	1.86%	0.34%
Fifth Decile Welfare	-0.28%	-0.42%	-0.29%	-0.26%	-0.20%	1.51%	0.23%
Sixth Decile Welfare	-0.25%	-0.41%	-0.29%	-0.26%	-0.21%	1.22%	0.15%
Seventh Decile Welfare	-0.26%	-0.42%	-0.33%	-0.29%	-0.25%	0.76%	0.00%
Eighth Decile Welfare	-0.20%	-0.34%	-0.27%	-0.24%	-0.20%	0.63%	0.01%
Ninth Decile Welfare	-0.09%	-0.17%	-0.11%	-0.11%	-0.08%	0.65%	0.11%
Tenth Decile Welfare	0.06%	0.09%	0.10%	0.07%	0.08%	0.27%	0.13%
Government Welfare	-0.16%	-0.23%	-0.03%	-0.02%	-0.01%	0.33%	0.08%
Primary Sector Profit Rate	-0.46%	-0.37%	-0.26%	-0.20%	-0.14%	1.54%	0.29%
Secondary Sector Profit Rate	-0.89%	-0.77%	-0.74%	-0.64%	-0.55%	1.91%	0.06%
Tertiary Sector Profit Rate	0.03%	-0.002%	0.22%	0.15%	0.29%	4.15%	1.25%
Ratio Investment/GDP	-0.07%	-0.04%	-0.01%	-0.01%	0.10%	3.02%	0.83%
GDP	-0.29%	-0.39%	-0.25%	-0.23%	-0.22%	0.00%	-0.17%
Compensatory Reduction of Cost of Capital					1.14%	26.7%	7.94%

Source: Own Elaboration.

The exercise is analogous to an efficiency loss of all sectors in the use of sector 27 outputs as an input. The general result is that GDP reduction is in the range of 0.23 to 0.39% depending on the assumptions on elasticity of substitution of factors in sector 27 and on the conditions in the labour market (unemployment or full employment). Even though expenses in audit are paid to domestic factors, there are still significant losses.

It is worth noting that the lesser government revenues –linked to GDP– affect more the poor (who receive most of government transfers). Instead, the richest are concentrated in the tenth decile; they are entitled with capital rewards, financial endowments and skilled labour income. Skilled labour is used more intensively in sector 27 and that could explain the observed slight gains; but beyond that, the tenth decile is a net creditor of the economy and it is benefited with financial resources appreciation (due to the real sector reduction in activity levels).

Firm profits diminish slightly, because they have to spend more in audit services. Instead, “Financial” sector 27 profits grow, since it is the provider of auditing services.

Notice that these cost increases are permanent (to be paid every period) and therefore gains must be compared in present value terms too.

Purchases of auditing services cut more the benefits in the sectors that are intensive in its services. The prices to consumers increase (according to its demand elasticity) and the costs grow for those using its products or services as inputs.

Three compensation exercises were conducted, using as a reference the Scenario 2, and considering only the case of Full Employment and High Elasticity of Substitution (Columns E, F and G in Table 1)¹⁴.

First of all, it was computed the reduction of the international rate of interest, necessary to restore the average profit rate in the economy, at its level prior to the increase in auditing costs. However, that is not sufficient to recover initial welfare levels. Column E of Table 2 presents

the results of simulating cost increases of extending stricter Corporate Governance standards, coupled with the reduction in the international rate of interest already mentioned. In other words, if higher expenses in auditing services apply, and also the international rate of interest were diminished in 1.14% of its previous level, then the profit rate of the economy will remain constant.

Secondly, it was investigated a compensation in the international rate of interest required to restore the GDP (at constant prices) level previous to the introduction of stricter standards (Column F). Welfare levels grow substantially, basically because the costs are transferred abroad. The reduction in the effort necessary to compensate the current account reduces exports, which in turn reduces GDP, and this creates a multiplying effect that obliges to reduce further the cost of capital to compensate. That is why the necessary reduction in the rest of the world factor payments to restore the former level of GDP is very significant (it must fall in more than a fourth of its former level).

Thirdly, it was computed the needed compensation to recover the welfare level of the decile more affected by the increased auditing costs (the seventh) in Scenario 2 (the biggest loser). Results are shown in Column G. It shows that the needed compensation require a fall in the international rate of interest of 8% on its original level to restore the seventh decile welfare to its initial level. However the rest of the deciles obtain significant net gains. Notice that in this case investments grow in terms of GDP, which means that the growth rate is being increased too.

VII Concluding remarks

The net gains of new standards of Corporate Governance have been analyzed, in quantitative terms, using cross-section studies or partial equilibrium models. Here we show that a general equilibrium perspective could explain different attitudes of societies to the adoption of stricter rules. Direct and indirect costs, as well as the

¹⁴ The model is of course sensitive to elasticities choice. What we did was to assume that elasticities of substitution were one (Cobb-Douglas assumption) to avoid problems of existence and just to give an illustration of results. Then we assumed different levels of elasticities of substitution in the industry that provides services of audit, to test the relevance of low elasticity of supply on the welfare results.

distribution of the burden, must be taken into account to understand evaluations of reforms.

When we use the CGE for the case of Argentina in 2003, we find that there is a reduction in GDP that varies in the range of 0.23 to 0.39% depending on the assumptions on elasticity of substitution and on the conditions in the labour market (unemployment or full employment), even though most audit costs are spent in domestic factors. The required reduction in cost of capital to compensate those costs depends on the benchmark used.

There are of course some very clear extensions that are necessary to have a complete picture, notably a dynamic version of the model to study growth among them, and it will be necessary to study more thoroughly the sensitivity to changes in parameters levels.

However this general equilibrium appraisal gives a warning that net gains could be negative and not necessarily negligible.



Bibliographical Reference

- Apreda, Rodolfo (2001). "Corporate Governance in Argentina. The Outcome of Economic Freedom (1991-2000)", *Corporate Governance, An International Review*, Volume 9, Number 4. October.
- Bebczuk, Ricardo (2005b). "Corporate Governance and Ownership: Measurement and Impact on Corporate Performance in Argentina", XLI Congreso Anual Asociación Argentina de Economía Política (AAEP).
- Bergen, Lara (2005). "The Sarbanes-Oxley Act of 2002 and its Effects on American Business. Financial Services Forum", College of Management. University of Massachusetts Boston.
- Burns P. (1996) . "Natural Monopoly Regulation". C.R.I. Technical Paper, no.4.
- Brooke, A., D. Kendrick and A. Meeraus (1992). *GAMS: A User's Guide, Release 2.25*. Scientific Press.
- CEF(2005). El gobierno corporativo en Argentina. Nota de Política # 5. Buenos Aires, julio.
- Chisari, O, A. Estache and C. Romero (1999). "Winners and Losers from the Privatization and Regulation of Utilities: Lessons from a General Equilibrium Model of Argentina", *World Bank Economic Review*, 13:2, 357-78.
- CRA International (2006). "Sarbanes-Oxley Section 404 Costs and Implementation Issues", Spring 2006 Survey Update.
- Ferris M. C. and J. S. Pang (1997). "Engineering and Economic Applications of Complementarities Problems", *SIAM Review*, Vol.39, No.4, December, 669-713.
- Fremond, Olivier and Mierta Capaul (2002). "The State of Corporate Governance: Experience from Country Assessment". World Bank Policy Research Working Paper 2828. Washington, June.
- Gifford, Richard and Harry Howe (2004), "Regulation and Unintended Consequences: Thoughts on Sarbanes Oxley", *The CPA Journal on Line*. NY Societies of CPAs. June.
- Gutiérrez Urtiaga, María (2004), "El gobierno de las empresas desde la perspectiva del análisis económico", Banco de España, Estabilidad Financiera No. 4.
- Holmstrom, Bengt and Steven Kaplan (2003). "The State of U.S. Corporate Governance: What's Right and What's Wrong?" *Journal of Applied Corporate Finance*, 15: 8-20.
- IDEA (2004). Workshop sobre Comité de Auditoría. Instituto para el Desarrollo Empresarial de la Argentina. Buenos Aires, abril.
- INDEC (2001). "Matriz de Insumo Producto para Argentina 1997", Ministerio de Economía y Servicios Públicos, Argentina.
- Kolstad C.D. and L. Mathiesen (1991). "Computing Cournot-Nash Equilibria", *Operations Research*, Vol.39, No.5, September-October, 739-748.
- La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei, Shleifer, 1999, Corporate ownership around the world, *Journal of Finance* 54.
- Marsili, María Celia (Directora), Miguel Araya, Diana Fabio de Montalbán, Eduardo Bacqué, Enrique Peláez, Ricardo Jucarrell Moffo y Gabriela Dall'Asta (2003), *Mercado de Capital. Régimen de las emisoras*. Adhesión al 50° aniversario de la CSA (1953-2003). UADE-CSA, Rubinzal-Culzoni Editores.



- Mathiesen L. (1985). "Computational Experience in Solving Equilibrium Models by a Sequence of Linear Complementarities Problems", *Operations Research*, Vol.33, No.6, November-December, 1225-1250.
- Mohanram, Partha and Shyam Sunder (2004). "How Has Regulation Fair Disclosure Affected the Functioning of Financial Analysts?". *Contemporary Accounting Research*. January.
- Murphy, Kevin (1998). "Executive Compensation". Mimeo, April.
- OECD (2004). *Principles of Corporate Governance*.
- OECD (2003). *Survey of Corporate Governance Development in OECD Countries*.
- Pyatt, G. and J. I. Round (1985). "Social Accounting Matrices. A basis for Planning" World Bank, Washington.
- Reina, Laura (2005). "Mala praxis. Seguros: protección para altos ejecutivos". *La Nación*, Buenos Aires, 3 de abril.
- Rutherford T. (1999). "Applied General Equilibrium Modelling with MPSGE as a GAMS Subsystem: An Overview of the Modelling Framework and Syntax", *Computational Economics*, Vol.14, Nos. 1-2.
- Shleifer, Andrei and Robert Vishny (1996). "A Survey in Corporate Governance". Working Paper 5554. National Bureau of Economic Research. Cambridge MA.
- Shoven, J. B. and J. Whalley (1992). *Applying General Equilibrium*. Cambridge University Press, New York.
- Varian H. (1992), *Análisis Macroeconómico*, Ed. Bosch, Barcelona.
- Wallison, Peter (2005), "Sarbanes-Oxley and the Ebbers Conviction". *Financial Services Outlook*. AEI Online, Washington: June.
- Zhang, Ivy Xiyang (2005), "Economic Consequences of the Sarbanes-Oxley Act of 2002". William E. Simon Graduate School of Business Administration. University of Rochester.

Bibliographical Reference

Accinelli, E. 1994, "Some Remarks about Uniqueness of the Equilibrium for Infinite Dimensional Economies." *Estudios Económicos* **21**, , pp. 315-326.

Luenberger, D. 1969, Optimization by vector space methods. *John Wiley and Sons Ltd.*

Mas-Colell, A. Whinston, M.; Green, J. 1995, Microeconomic Theory' *Oxford University Press* .

Negishi, T. 1960, "Welfare Economics and Existence of an Equilibrium for a Competitive Economy" *Metroeconomica* **12**, 92- 97.