

Chiquiar, Daniel; Ramos-Francia, Manuel

Working Paper

Competitiveness and growth of the Mexican economy

Working Papers, No. 2009-11

Provided in Cooperation with:

Bank of Mexico, Mexico City

Suggested Citation: Chiquiar, Daniel; Ramos-Francia, Manuel (2009) : Competitiveness and growth of the Mexican economy, Working Papers, No. 2009-11, Banco de México, Ciudad de México

This Version is available at:

<https://hdl.handle.net/10419/83734>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Banco de México
Documentos de Investigación

Banco de México
Working Papers

Nº 2009-11

Competitiveness and Growth of the Mexican Economy

Daniel Chiquiar
Banco de México

Manuel Ramos-Francia
Banco de México

November, 2009

La serie de Documentos de Investigación del Banco de México divulga resultados preliminares de trabajos de investigación económica realizados en el Banco de México con la finalidad de propiciar el intercambio y debate de ideas. El contenido de los Documentos de Investigación, así como las conclusiones que de ellos se derivan, son responsabilidad exclusiva de los autores y no reflejan necesariamente las del Banco de México.

The Working Papers series of Banco de México disseminates preliminary results of economic research conducted at Banco de México in order to promote the exchange and debate of ideas. The views and conclusions presented in the Working Papers are exclusively the responsibility of the authors and do not necessarily reflect those of Banco de México.

Competitiveness and Growth of the Mexican Economy*

Daniel Chiquiar[†]
Banco de México

Manuel Ramos-Francia[‡]
Banco de México

Abstract: We address the role that deep, structural factors may have as determinants of Mexico's economic growth. We argue that Mexico's poor growth performance appears to be associated not only with shorter-run events such as the "lost decade" of the eighties, but also with supply-side features of the economy that have been present for at least four decades. Mexico's low competitiveness and poor growth potential seem to reflect an institutional framework that tends to support rigid, non-competitive market structures, and incentives that promote the allocation of resources towards unproductive rent-seeking activities relatively more than into investment, production, and adoption of superior technologies. We present examples of input markets where we believe these issues are central. We conclude that solving this situation requires microeconomic policies that lead to fundamental changes in the incentive structure of the economy.

Keywords: Competitiveness and growth, productivity, efficiency, comparative advantage.

JEL Classification: O31,O43, O12.

Resumen: Se estudia el papel que diversos factores estructurales tienen como determinantes del crecimiento económico de México. Argumentamos que el desempeño de la economía mexicana ha estado asociado no sólo con eventos de relativamente menor plazo, como la "década perdida" de los ochenta, sino por factores de oferta que han estado presentes desde hace por lo menos cuatro décadas. El bajo crecimiento y la baja productividad que México ha presentado parecen reflejar un marco institucional que fomenta estructuras rígidas en los mercados y una falta de competencia en diversos sectores, y genera incentivos para asignar recursos hacia actividades improductivas en lugar de impulsar la inversión, la producción y la adquisición y/o adopción de mejores tecnologías. Presentamos algunos ejemplos de mercados de insumos en donde consideramos que estos problemas son fundamentales, y concluimos que la solución de éstos requiere políticas microeconómicas enfocadas a resolver los problemas de incentivos que las instituciones actuales han generado.

Palabras Clave: Competencia y crecimiento, productividad, eficiencia, ventaja comparativa.

*This paper was presented at the Conference "Finance and Economic Growth: Banking and Infrastructure in Mexico" held at the University of California, San Diego on June 1st, 2007. An earlier article raising some of the issues discussed in this paper is Ramos-Francia (2006). We thank Carlo Alcaraz, Nicolás Amoroso, Carlos Capistrán, Javier Cuellas, Rafael Del Villar, Alejandro Díaz de León, Edna Fragosó, Alejandro Gaytán, Eduardo Martínez-Chombo, Núria Quella and Héctor Salgado for very helpful comments and contributions. Jonathan Levistein, Paulina Martínez and Othón Moreno provided excellent research assistance. The opinions in this paper correspond to the authors and do not necessarily represent those of the Banco de México.

[†] Dirección General de Investigación Económica. Email: dchiquiar@banxico.org.mx

[‡] Dirección General de Investigación Económica. Email: mrfran@banxico.org.mx

1 Introduction

In this paper we address the role that deep, structural factors may have as determinants of Mexico's growth performance. We argue that the overall performance that this country has exhibited at least since the sixties, when compared to other regions that have successfully achieved high and sustained growth rates, is fundamentally related to supply-side factors that imply a poor long-run growth potential and does not only reflect the macroeconomic mismanagement and recurrent crises that led to the "lost decade" of the eighties and the Tequila crisis of the mid-nineties. In particular, Mexico's low competitiveness and poor growth potential are apparently related to: i) the presence of rigid and non-competitive market structures, which may be leading to an inefficient allocation of resources; and, ii) an institutional design which may be promoting rent-seeking activities more than investment, production and adoption of superior technologies and efficient work practices.

These features of the Mexican economy may be interrelated. In particular, certain weaknesses in the institutional design governing economic activity may be the main sources of the existence of rigid and non-competitive market structures which allow specific groups of economic agents to extract rents. In turn, these specific groups could be influencing the policymaking process and, in particular, the institutional design, to their advantage. In the end, these distortions prevent Mexico from fully exploiting its comparative advantages. We believe that the solution to this situation, therefore, requires microeconomic policies that lead to a deep change in the incentive structure that many groups of economic agents face, much more than specific (macroeconomic) policies that may act mainly on the demand side of the economy.

The remainder of the paper is divided into five parts. In the following section we illustrate Mexico's overall growth performance during the last four and a half decades and compare it with other more successful developing regions of the world. The third section analyzes the issue of competitiveness and presents some empirical evidence related to the factors that may be determining Mexico's recent export and growth performance. The fourth section analyzes the markets of some inputs that could be relevant determinants of Mexico's competitiveness and that exemplify the issues raised in this paper. The fifth

section describes some recent progress achieved in these areas and highlights some challenges that remain. The sixth section summarizes some final thoughts.

2 Mexico's growth performance

Figure 1 compares the 1960-2008 behavior of Mexico's per capita GDP with that of other regions that had similar or lower levels of development in 1960, but that had a successful growth performance in the following 48 years. In particular, we compare Mexico with the group of East Asian countries and with four of the more recently industrialized Western European countries. As a benchmark, we also include the performance of the Latin American region (excluding Mexico) as a whole.¹

As may be observed, Mexico's performance has been unsatisfactory, when compared with other developing regions of the world.² Indeed, during the last 47 years, Mexico's average per capita growth rate was only 1.8% per year. In contrast, East Asia's growth was 5.1% per year, while the four European countries considered averaged a growth rate of 3.2% per year. Consequently, Mexico's current per capita GDP is around half of the levels observed in East Asia and less than half of the European Four countries. These current differentials in income stand out if we consider that, in 1960, Mexico's per capita income was only 20% smaller than the one observed in the European Four countries and was 2.4 times larger than the average level recorded by the East Asian countries.

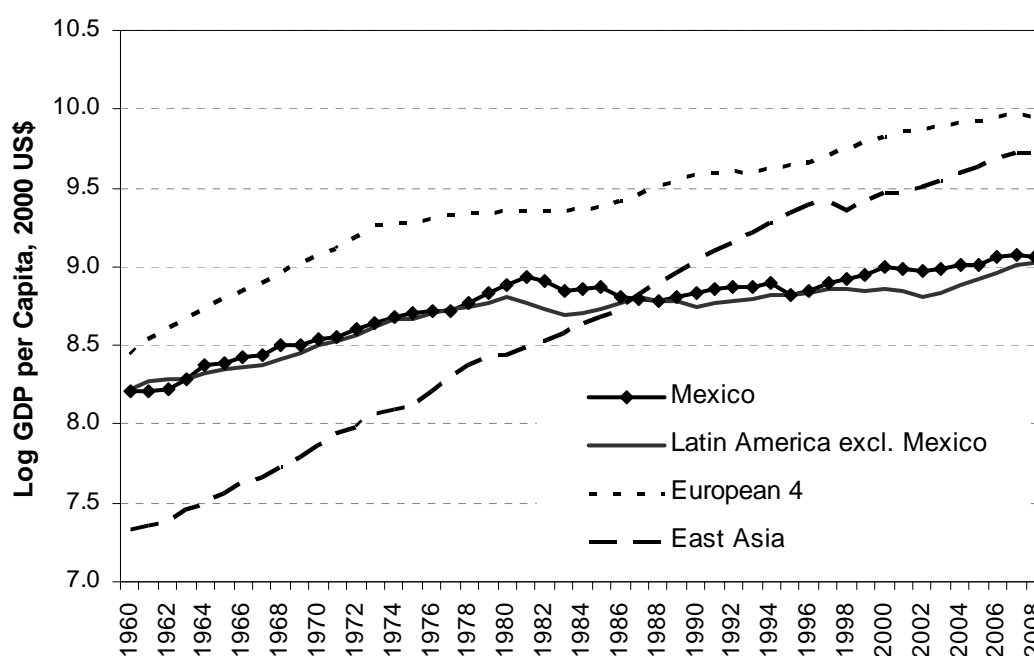
It is important to recognize that, in part, Mexico's overall poor performance, as summarized by average growth rates during the period we are analyzing, reflects the effects

¹ The group of East Asian countries includes South Korea, Hong Kong, Malaysia, Singapore, Thailand, and Taiwan. The countries we call European Four are Greece, Ireland, Portugal, and Spain. Latin America includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Nicaragua, Peru, Panama, Paraguay, Uruguay, and Venezuela.

² As may be noted, this poor growth performance has characterized the Latin American region as a whole, and not only Mexico. Concerning this point, Cole, Ohanian, Riascos and Schmitz, Jr. (2005) conduct a study for the whole Latin American region that is similar in spirit to the analysis we make in this section. They reach similar conclusions as the ones we present in this paper for the particular case of Mexico. In particular, they conclude that Latin America's stagnation is not the consequence of the post-debt crisis period, but of an unsatisfactory performance in terms of Total Factor Productivity (TFP) growth that has characterized the region for a long period of time and, in particular, for decades before the "lost decade" of the eighties. As we also do, they suggest that this may reflect inefficient production derived from the presence of barriers to competition in the region's markets. Similarly, Restuccia (2008) finds that the bulk of the difference in GDP per capita between Latin America and the U.S. is explained by the low TFP levels in the former, which in turn could be a consequence of institutions and policy distortions that increase the costs of doing business (cost of entry of plants) and that reallocate resources from the most productive to the less productive plants (public enterprises, trade and labor restrictions, taxation, competition barriers and excess regulation, among other policies).

of macroeconomic mismanagement and the recurrent crises that afflicted the Latin American region in general, and Mexico in particular, during the “lost decade” of the eighties. Indeed, Mexico’s growth rates were clearly higher during the sixties and seventies than during this period (see Table 1). This highlights that one important element to sustain economic growth is the application of macroeconomic policies that ensure stability and, in particular, that avoid the type of crises observed during the eighties. In this front, Mexico has made important progress in the last decade.

Figure 1. Per Capita GDP: Regional Averages (PPP Adjusted)



Source: Data from Heston and Summers (2006), updated to 2008 with International Monetary Fund (2009).

Macroeconomic stability, however, does not seem to be enough to boost growth towards rates comparable to those recorded by the most successful developing regions of the world. While periods of macroeconomic stability are indeed associated with higher average growth rates, Mexico’s performance was relatively unsatisfactory even in those periods. Indeed, as we may observe in Table 1, although a slight recovery was observed in Mexico during the nineties, average growth rates were still below those observed prior to the eighties and those attained by other developing regions of the world. In fact, growth stagnated again in the first eight years of the twenty-first century (from 2001 to 2008), even

when the domestic macroeconomic environment was fairly stable.³ Furthermore, we may note that even before macroeconomic stability went astray, during the sixties and seventies Mexico's growth rates were already lower than the ones observed in East Asia and the European Four countries.

Table 1. Per Capita GDP: Regional Averages (PPP Adjusted)

2000 Dollars						
	1960	1970	1980	1990	2000	2008
Mexico	3,695	5,109	7,201	6,877	8,082	8,646
European 4	4,629	8,690	11,594	14,459	18,578	21,069
East Asia	1,530	2,589	4,641	8,387	12,947	16,756
Latin America excl. Mexico	3,733	4,896	6,648	6,275	7,058	8,310
Annual Growth Rates						
	1961-1970	1971-1980	1981-1990	1991-2000	2001-2008	1961-2008
Mexico	3.3	3.5	-0.5	1.6	0.8	1.8
European 4	6.5	2.9	2.2	2.5	1.6	3.2
East Asia	5.4	6.0	6.1	4.4	3.3	5.1
Latin America excl. Mexico	2.7	3.1	-0.6	1.2	2.1	1.7

Source: Data from Heston and Summers (2006), updated to 2008 with International Monetary Fund (2009).

The arguments made above suggest that Mexico's poor growth rates may be reflecting deeper factors that have limited its growth potential from a longer-run perspective.⁴ The recurrent crises that affected its performance during most of the eighties and part of the nineties exacerbated this problem, but do not seem to be the fundamental causes of this country's overall poor long-run performance. This also suggests that, in order to boost growth and, thus, converge to the per capita income levels of other successful

³ This is not a consequence of the effects that the global crisis had on Mexico's growth in 2008. Indeed, the average growth rate for 2001-2007 was only 1.1%.

⁴ Diverse methods to estimate the growth potential of the Mexican economy, such as HP filters and Blanchard and Quah's (1989) decompositions, among others, suggest that the annual growth of Mexico's potential GDP was within the 3-3.5% interval for 2006-2007. Given these figures and current population trends, Mexico would roughly need to double its potential growth rate just in order to achieve South Korea's current per capita GDP level by the year 2020. The results of these exercises are available from the authors upon request. The evidence presented in Miketa (2004) and Loayza *et al.* (2005) suggests that the main factor limiting growth of Mexico's GDP seems to be, in turn, a low rate of growth of TFP.

regions, Mexico needs a new set of policies that act mainly on the supply side of the economy. In particular, this country is in the need of enhancing its competitiveness.

3 Competitiveness, export performance and growth

The concept of competitiveness is complex and difficult to define. There is no consensus on its definition and significance and, to some, may in fact seem to be a meaningless concept (see e.g. Krugman, 1994). To give economic content to this concept, we link it to the factors that may lead an open economy to allocate efficiently its available resources, so as to achieve the highest possible level of income for its citizens. To the extent that the country may initially be below its full productive potential, these factors may also influence the rates at which the country catches up to this potential. We therefore associate the concept of competitiveness with an open economy's ability to exploit fully its comparative advantages and with the extent to which its system of incentives leads it to attain high productivity levels in the sectors where it allocates most of its resources.^{5,6} Indeed, it is difficult to think of a country as being competitive if diverse distortions prevent it from exploiting its comparative advantages fully and if its institutional framework

⁵ According to the World Economic Forum (2007), competitiveness is: *"the set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the sustainable level of prosperity that can be earned by an economy. In other words, more competitive economies tend to be able to produce higher levels of income for their citizens. The productivity level also determines the rates of return obtained by investments in an economy. Because the rates of return are the fundamental determinants of the growth rates of the economy, a more competitive economy is one that is likely to grow faster over the medium to long run. The concept of competitiveness thus involves static and dynamic components: although the productivity of a country clearly determines its ability to sustain a high level of income, it is also one of the central determinants of the returns to investment, which is one of the central factors explaining an economy's growth potential."*

⁶ It is important to note that the relevant concept that determines the growth rate of the standard of living of the population of a country is the absolute rate of growth of its productivity, and not its productivity growth relative to other countries. In particular, real wages of each particular country will adjust to match its own labor's marginal product which, in turn, is driven by the absolute growth rate of its productivity. In this context, an acceleration of productivity in other countries will not affect the real wage (and the standard of living) of a particular country that does not exhibit such acceleration. In this situation, the exchange rate trend would adjust to account for any productivity growth differentials between this country and the rest of the world, so that the country with a given productivity growth would be as able to compete in world markets as before (see Krugman, 1994). It is the case, however, that the rest of the world would exhibit a faster growth in standards of living than the country not achieving an acceleration in its productivity. A caveat to this discussion that may be relevant for the issues raised in this paper is that, if productivity in a specific country grows slower than in the rest of the world, in those specific sectors where this country concentrates its exports, then this productivity differential could indeed lead to a deleterious terms-of-trade effect on this country's real income levels (see Johnson, 1955).

promotes unproductive rent-seeking activities, rather than investment in physical and human capital and the use of superior technologies and efficient work practices.

It is important to highlight that the concepts mentioned above and, in particular, comparative advantage, should not be understood in static terms. Even if, at a specific point of time, comparative advantage may be determined by current endowments or technologies, the future comparative advantages of a country may in fact reflect choices currently made in terms of R&D expenditures, the degree of adoption of new technologies, human capital formation, and the degree of specialization in sectors where economies of scale or learning-by-doing type of spillovers are present (see Krugman, 1986). If a country adopts available modern technologies and invests in the formation of a specialized labor force to use these technologies in a specific sector, it may develop a comparative advantage there, even if an initial comparative advantage was not present.⁷

Under this vision, we believe that the fundamental driver of competitiveness lies in the structure of the incentives faced by economic agents. By structure of incentives we understand that which is embedded in the set of laws, rules and regulations which determines how agents interact economically, politically and socially. It is clear that, even if each of the countries that have succeeded in sustaining high growth rates in the last decades has taken advantage of specific circumstances, a common factor that seems to be present in all of them is an incentive system that rewards physical and human capital accumulation, R&D activities, the adoption of modern technologies and, in general, an efficient allocation of resources. In particular, some or all of the following interrelated factors seem to be essential: i) an institutional design that aligns economic agents' incentives with those activities that provide greater social benefits and, in particular, that induces the adoption of superior technologies, investment in physical and human capital and the use of efficient work practices; ii) flexibility in the allocation of resources; and, iii) markets that operate under contestability conditions.⁸

⁷ Hausmann, Hwang and Rodrik (2007) argue that the pattern of specialization of a country may have implications for economic growth. In particular, some goods may lead to higher knowledge spillovers than others. To the extent that one country assigns more resources than another to the production of the first type of goods, it may achieve a higher growth rate, even if both countries initially had the same factor endowments and technology levels.

⁸ It is important to note that these three elements tend to complement each other. For example, the benefits of higher competition may be larger and may be reaped faster if there is more flexibility in the allocation of resources.

Regarding the points listed above consider first the topic of market contestability. It is well known that, when an economy operates under competitive conditions, its resources are used more efficiently in terms of the value added they generate. Furthermore, under a competitive environment, consumers have greater access to a wider variety of goods and services, at lower prices. In contrast, non-competitive market structures imply welfare losses derived from allocative and productive inefficiencies and, in fact, may entail additional, larger losses if they induce unproductive rent-seeking activities.⁹

Related to the above, a recent strand of the literature has formalized the existence of a link between the presence of barriers to competition and the use of inferior technologies and inefficient work practices (see Holmes and Schmitz, 1995 and 2001; Krusell and Rios-Rull, 1996; Parente and Prescott, 1999 and 2000). According to this literature, barriers to the adoption of more productive technologies are erected in some countries in order to protect industry insiders with vested interests from outside competition. These insiders would lose rents if superior technologies developed elsewhere are adopted in their country, and are able to successfully block their adoption as a consequence of: i) their larger ability to organize themselves and overcome free rider problems in their efforts to lobby for policies that are beneficial to them, usually by being politically over-represented; and, ii) the fact that, while the benefits of protection are concentrated by small, identifiable groups of incumbents, the costs of protective policies are usually spread among large groups of agents (see Bridgman, Livshits and MacGee, 2007).¹⁰ Thus, even when the social costs of protection may be larger than the private benefits received by incumbents, their asymmetric ability to lobby effectively may lead to an equilibrium in which governments decide to protect them through the prohibition of the adoption of technologies that would make all

⁹ See Motta (2004). The aforementioned considerations may become especially relevant when non-competitive structures and pricing characterize markets for general-use inputs and, especially, in sectors where inputs are supplied through networks (telecommunications, energy, transport, etc.). In this case, not only consumers may be affected directly, but the overall industrial sector's competitiveness may be hurt by higher basic input prices, which in turn may affect the economy's growth potential.

¹⁰ Coalitions of workers in a specific industry that have a lot to gain from a specific protective policy may easily have the ability to punish individuals who don't contribute to the efforts to lobby for protection by excluding them from working in the industry. In contrast, broad based lobby groups of consumers who are affected by higher prices may not be able to avoid specific individuals who do not cooperate from purchasing goods. This idea goes back to Olson (1982), who argued that policies that protect small groups at the expense of the general public exist because small groups may organize themselves more effectively.

workers of the economy more productive.^{11,12} This mechanism appears to be able to explain a considerable part of the differences in Total Factor Productivity (TFP) observed across different countries of the world (see e.g. Parente and Prescott, 1999 and 2000; Herrendorf and Teixeira, 2004).¹³

In order to be able to exploit comparative advantages fully, flexibility in the allocation of resources is also required, especially when prices may be changing as a consequence of diverse shocks in the international goods' markets. In this context, rigid market structures may slow down or prevent the movement of factors of production towards their most productive uses.¹⁴ For example, diverse policy-induced labor market distortions and rigidities, such as employment subsidies or dismissal costs, may lead to an equilibrium in which labor is inefficiently allocated into low-productivity firms, thus lowering aggregate TFP (see Caballero *et al.*, 2006; Lagos, 2006). Bankruptcy laws that lead to an equilibrium with inefficiently many low-productivity firms actively operating may act in the same direction (Bergoeing *et al.*, 2002). Again, in some cases these rigidities

¹¹ More intense competition may also boost innovation by inducing incumbents that are close to the technological frontier to "escape competition" by innovating (Aghion and Griffith, 2005) or by increasing the relative profitability that entrepreneurs face of selling innovations to incumbents instead of entering the market (Norbäck and Persson, 2008). In both cases, an inverted U-shaped relationship between competition and innovation is predicted.

¹² Even if the particular interest group that is benefited by the status quo is not politically over-represented and does not influence policymaking directly, comprehensive reform to the institutional framework may be difficult to achieve. This is the case when different unequally endowed constituencies exist. Each of these constituencies would support some reforms that expand its own opportunities but will oppose others that reduce them, even when the latter could benefit other constituencies. These groups could therefore find it hard to agree on reforms. In this context, a comprehensive reform path that would lead to overall gains for the society may not be supported by majority vote in a democratic system (see Rajan, 2009).

¹³ The evidence in Clark (1987) and Wolcott (1994) suggests that differences in work practices, themselves determined by differences in workers' ability to resist employers' attempts to increase the number of machines per worker in the textile industry, were a key determinant of cross-country productivity differences in this industry at the beginning of the twentieth century. On the other hand, using the Great Lakes iron ore producers' experience in the early 1980s as an empirical example, Schmitz (2005) shows that increased competition promotes productivity improvements. He shows that, in this particular experience, productivity increases observed after producers started facing foreign competition were mostly the result of changes in work practices, and not fundamentally related to more conventional factors, such as the closure of low-productivity mines, changes in the scale of production of individual mines, improvements of technology or changes in the skill composition of the labor force.

¹⁴ As we will see below, one such shock could be China's increasing presence as a supplier of labor-intensive manufactured goods and a demander of commodities in international markets. This has contributed to a change in relative prices that has affected the terms of trade of labor-abundant manufacturing exporters and has benefited commodity exporters. Clearly, a manufacturing exporting country will be in a better position to face this shock without large welfare losses to the extent that it has enough flexibility to move its resources out of labor-intensive manufacturing towards other sectors of the economy where it may retain comparative advantages, such as could be some commodities, skill-intensive manufactures or services.

may be responding to vested interests of groups that could be harmed by more flexible market structures and that have the ability to influence the regulatory process.

The discussion in the previous paragraphs suggests that diverse features defining the structure of incentives of the economy may lower aggregate TFP by either: i) inhibiting the adoption of superior technologies; or, ii) leading to an inefficient allocation of available resources, for given technology levels.¹⁵ Along with the degree of monopoly power and the presence of rigidities in product or input markets, other institutional features of the economy, such as those related with contract enforcement, private governance, the design of public policies and intellectual property rights, among others, may also affect aggregate TFP through these two mechanisms (see e.g. Nicoletti and Scarpetta, 2006; Khan and Sokoloff, 2007; Acemoglu *et al.*; 2007; Restuccia and Rogerson, 2007). Not surprisingly, it would seem to be the case that the most profound factor determining long-term economic performance is related with the broad set of institutions governing economic, political and social interactions between different groups or agents (see Hall and Jones, 1999). This institutional framework not only determines to what extent non-competitive and rigid market structures may be perpetuated or not through the influence of interest groups on the regulatory process, but in general defines the incentive structure that economic agents face in order to produce, invest in physical and human capital and conduct activities that lead to the use of superior technologies and efficient work practices.¹⁶

Of course, this discussion begs the question of how these institutions are designed and built in the first place. In particular, in many developing countries which currently find themselves in the phase of building up institutions, it is relevant to analyze what incentives

¹⁵ Some distortions could affect productivity through both mechanisms simultaneously. See a related discussion in Lagos (2006).

¹⁶ A growing strand of the literature suggests the existence of a link between comparative advantage and international differences in institutional factors, such as property rights protection, contract enforcement and labor market flexibility. In particular, it is shown that, holding other factors constant, countries with better institutions tend to specialize in industries that are more sensitive to the presence of efficient institutions (see Levchenko, 2004; Nunn, 2005; Acemoglu *et al.* 2007; Costinot, 2007; Cuñat and Melitz, 2007). In this context, superior institutions may lead some countries to specialize in sectors with larger spillover effects, as in Hausmann, Hwang and Rodrik (2007), and to enjoy higher economic growth rates (see Young, 1991; Levchenko, 2004). Furthermore, institutional quality induced international specialization may also influence returns to schooling and, thus, human capital accumulation. In particular, individuals may endogenously choose their schooling levels, knowing that institutional development determines the benefits from education (see Vogel, 2006). In this context, institutional quality may be a common cause of both comparative advantage and of human capital accumulation. Indeed, the higher levels of human capital observed in developed countries may reflect, therefore, an endogenous response to the presence of superior institutions.

face those that are designing them. In effect, in many cases it is not difficult to see that institutions may begin to become flawed at the very stage of conception (in terms of not being designed to promote long-term growth).

3.1 Mexico's lack of competitiveness

Within the conceptual framework described above, Mexico's low competitiveness appears to be related to an institutional design that seems to support the presence of rigid and non-competitive market structures, which in turn may lead to an inefficient allocation of resources and to a low degree of adoption of superior technologies and efficient work practices. In particular, the institutional framework tends to be relatively more conducive to the promotion of unproductive rent-seeking activities than to the enhancement of the productive potential of the economy (see Levy and Walton, 2009). Indeed, there are many examples where the conditions to achieve an efficient allocation of resources and to boost productivity are not met:

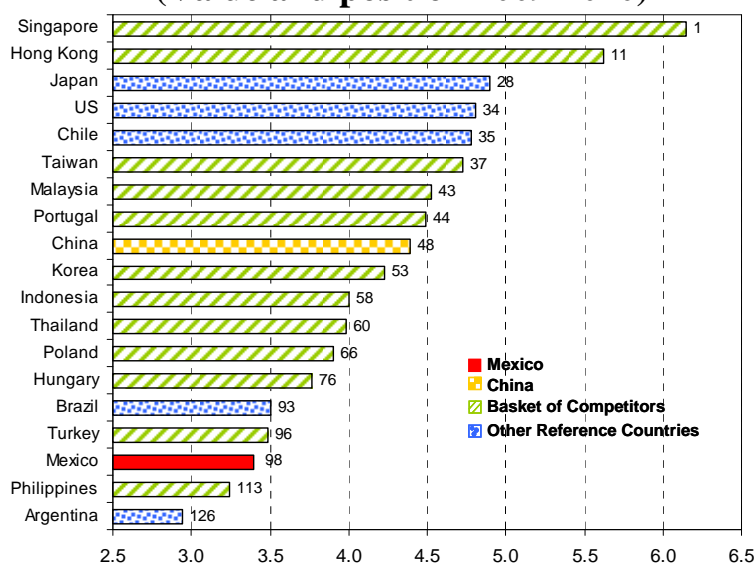
- a) First, in relation to institutional design, it is well known that Mexico's position in diverse international indexes that compare the countries' institutional framework is relatively low and has been deteriorating in the last few years. For example, in the World Economic Forum sub index of institutions (which belongs to the Global Competitiveness Index (GCI) of this Forum), Mexico's position is very low when compared to several other countries, many of which, as will be shown below, are Mexico's direct competitors in international markets (see Figure 2).^{17,18} Furthermore, the country's position has been deteriorating in the last years. Indeed, from being in position 50 in 2003, Mexico fell to position 98 in 2009.^{19,20} In terms of the GCI, Mexico moved from position 47 in 2003 to position 60 in 2009.²¹

¹⁷ Prior to the 2005-2006 report, this sub index referred exclusively to public institutions. In the last five reports, however, this sub index also includes an evaluation of private institutions.

¹⁸ We define the basket of Mexico's competitors as the group of countries that exhibit a high and statistically significant Spearman correlation with Mexico in terms of their patterns of comparative advantage. This group includes China, Taiwan, Thailand, South Korea, Malaysia, Hong Kong, Singapore, Turkey, Philippines, Indonesia, Hungary, Poland and Portugal. We describe below the methodology used to identify this group of countries.

¹⁹ The sample of countries surveyed for these indexes has been increasing along time. Considering the same group of countries that have been present in all surveys within the 2003-2009 period, Mexico went from position 49 in 2003 to position 74 in 2009.

**Figure 2. Competitiveness Index; Quality of Institutions
(Value and position 2009-2010)**



Source: World Economic Forum (2009).

There are some specific dimensions related with its institutional design in which Mexico tends to be rated unfavorably. Among others, we may mention accountability, political stability, rule of law and corruption (see Kauffman, Kraay and Zoido-Lobaton, 1999). Possibly as a consequence of this, the system of incentives to conduct activities that lead to the use of superior technologies seems to be ineffective: according to the evidence presented in Lederman, Maloney and Servén (2005), Mexico underperforms other countries in terms of diverse indicators of R&D investment, innovation efforts and technology adoption, even after controlling for its level of development. To this list we should add that, as we will discuss below, in some specific markets of nontradable goods the prevalent

²⁰ Other indexes tell fundamentally the same story. For example, Mexico's position within the confidence index among foreign direct investment recipient countries (FDI Confidence Index) computed by A.T. Kearney (2005) remained in the first ten places from 1998 to 2004 and, in that last year, Mexico was rated third. From 2005 on, however, Mexico fell dramatically, placing itself in the 16th position in 2006 and in the 19th position in 2007. It is also worthwhile to mention the results of Conway, Janod and Nicoletti (2005), who rank OECD countries according to diverse product market regulation indicators. The results suggest that Mexico and Hungary are the only countries within the most-regulated group that did not exhibit significant improvements between 1998 and 2003. Furthermore, in some specific dimensions, such as in barriers to competition and to trade and investment, Mexico's 2003 rating worsened, as compared to 1998.

²¹ If we keep the sample of countries constant, Mexico fell from position 47 in 2003 to position 49 in 2009 in the GCI.

incentives seem to make it more profitable to engage in rent-seeking activities than to pursue the creation of wealth.

b) While the process of trade liberalization started in the late 80's may have brought with it more market discipline into manufacturing, competition did not seem to have reached many non-tradable sectors. In this context, the non-competitive market structure of many inputs that are provided through networks, such as financial services, telecommunications, electricity and transport, may be affecting the competitiveness of firms that use intensively these inputs (see Perez Motta, 2007).²² We will analyze these issues with more detail in the following sections.

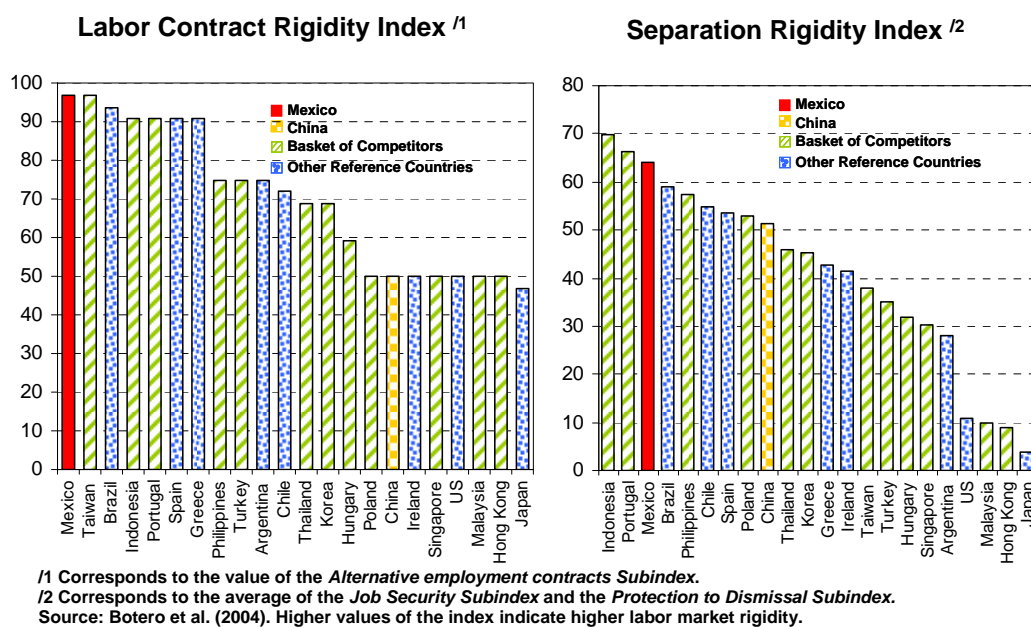
c) Similarly, a good example of market rigidities in Mexico is provided by the labor market. Several regulatory constraints currently in place, such as the difficulties to create flexible labor contracts and the high dismissal costs, may limit the flexibility with which resources in this market are allocated towards their most productive uses and may be reducing the incentives to invest in human capital, therefore affecting aggregate productivity and potential growth.²³ Indeed, according to the results of diverse studies (Heckman and Pagés, 2004; Botero, *et al.*, 2004), Mexico's labor regulations tend to imply large rigidities and compare unfavorably with many other countries of the world in terms of labor market flexibility (see Figure 3). It is important to highlight that the formal sector of the economy tends to comply with these regulations to a larger extent than the informal sector. In this context, although the existence of a large informal sector may enhance the true flexibility of the market, this is apparently being achieved at the cost of having a relatively large

²² Hanson (1994) warned that, without appropriate antitrust policies in place at the time, the liberalization reforms undertaken in Latin America during the eighties and, in particular, the privatization of highly concentrated industries, could lead to a situation in which the governments would only trade the inefficiencies of state control with the inefficiencies of imperfect competition.

²³ In fact, more can be said. According to the model in Lagos (2006), certain features of the economy, such as high costs of creating new jobs, large dismissal costs and an absence of unemployment insurance, would all act in the direction of lowering equilibrium unemployment and aggregate TFP, by leading to a smaller rate of destruction of low-productivity firm-worker matches. In this context, it is relevant to note that open unemployment rates in Mexico are well known to be indeed low, by international standards. As will be seen below, consistently with Lagos (2006), the consequence of the rigidities in the Mexican labor market seems to be instead a large prevalence of low-productivity jobs in the informal sector of the economy.

share of the labor force employed in relatively low productivity jobs.²⁴ In fact, it may be possible to argue that the presence of a large informal sector is precisely a market response to the presence of diverse distortions, such as onerous regulations in the formal sector of the economy, non-competitive market structures (which limit the levels of employment in the formal sector), and social protection policies that could be increasing the relative benefits to workers of becoming employed in the informal sector of the economy (see Levy, 2007).

Figure 3. Labor Market rigidity



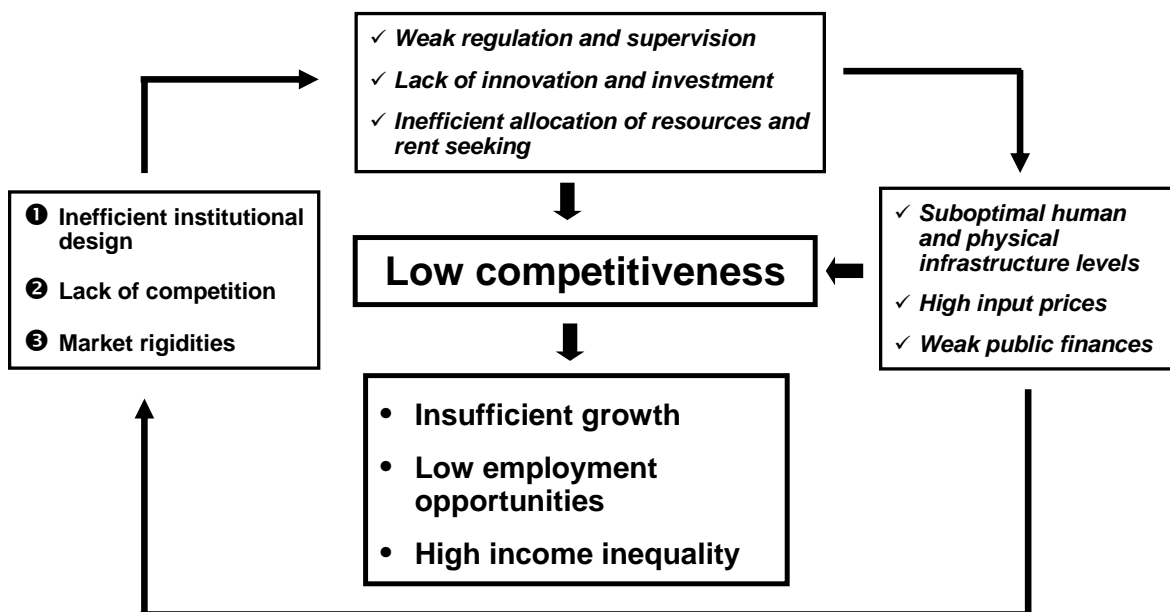
It is important to note that the rigidities in terms of labor contract creation and job separation are not the only distortions that may be characterizing the labor market. Other factors, such as the bargaining strength of labor unions in some strategic (non-tradable) sectors that provide basic inputs and where product market competition is lacking, may be equally or even more relevant. Indeed, the bargaining power of trade unions in sectors with limited competition tends to

²⁴ According to preliminary results in Alcaraz, Chiquiar and Ramos Francia (2008), the formal-informal income gap, controlling for observed and unobserved heterogeneity of workers, is estimated to be larger than 10%. This could be suggestive of a significant productivity gap between these sectors. Furthermore, according to Levy (2007), given the productivity differentials between the informal and formal sectors, the cost of having an inefficiently high level of informal employment in Mexico may represent around 1.3% of yearly GDP.

generate a pattern of rent sharing that translates into high prices, low service quality, and restrictions on the creation of productive employment and investment in human capital and modern technologies. In Section 3 of this paper we will see the specific case of the electricity industry. These distortions may be acting as a tax on employment and production in the formal sector of the economy and may be clearly limiting the competitiveness of industries that use these inputs intensively.

It is relevant to note that there is feedback between institutions supporting an efficient allocation of resources, the degree of competition and market flexibility. For example, a lack of competition in a sector may lead to the presence of a weak regulatory institution, by enhancing the insiders' ability to influence the policymaking process. Such institutional weakness, in turn, tends to reinforce the permanence of a lack of competition in that sector.

Figure 4. Competitiveness in Mexico



These ideas are illustrated in Figure 4. An inappropriate institutional design, a lack of competition, and market rigidities lead to an environment of weak regulation and supervision, induce rent seeking behavior and an inefficient allocation of resources and have as a consequence low innovation and adoption of modern technologies, as well as

reduced investment rates. These factors, along with their consequences on the levels of human and physical capital, on public finances and on the setting of (non-competitive) prices, diminish the competitiveness of the economy. More importantly, in such an environment, these results in turn may reinforce an environment of low competition and market rigidities, through the influence that specific rent-seeking groups may have on the institutional design process. This vicious cycle not only leads to low competitiveness, but ultimately translates into less employment opportunities, slower growth and an inequitable distribution of income. Indeed, within this framework an inefficient allocation of resources, a low growth potential and a high income inequality may be seen as consequences of an institutional design that protects specific interest groups by maintaining an economic environment characterized by inequality in opportunities and, thus, by preventing some agents in the economy from fully exploiting their economic potential (see Bourguignon and Dessus, 2009).

3.2 Comparative advantage and export performance of the Mexican economy

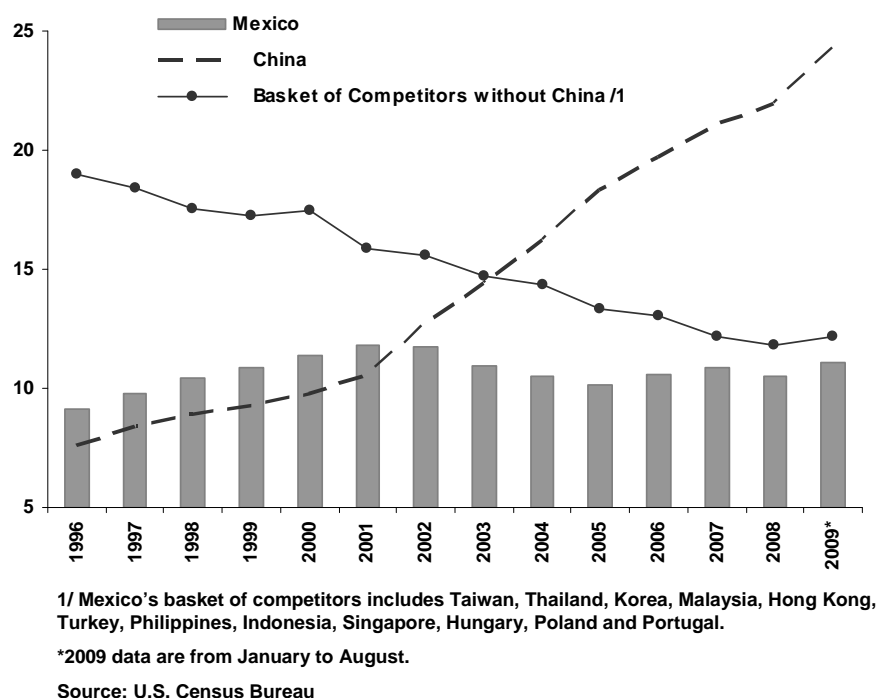
Mexico's relatively low competitiveness seems to have become more evident as other countries that have comparative advantages in goods in which Mexico had previously specialized in have increasingly gained market access in international trade flows. Indeed, the increased competition from these countries has had significant effects on Mexico's international trade. As we may observe in Figure 5, after NAFTA came into effect and up to the year 2001, Mexico had been gaining share in the U.S. manufactured goods market. After the end of that year, which coincides with China's entry into the World Trade Organization (WTO), Mexico lost share in this market continuously until 2005.²⁵ Simultaneously, China quickly gained market share.²⁶

²⁵ After 2005, the share of Mexican manufacturing exports within U.S. imports exhibited an erratic behavior. In particular, it rose during 2006 and 2007, only to decrease again in 2008. Finally, during the first eight months of 2009 it rose again. This pattern seems to have responded to diverse shocks, such as the changes in the U.S. economy's position in the business cycle, the differences between the growth of U.S. GDP and its industrial production (which is more closely linked to Mexico's manufacturing) and the depreciation of Mexico's real exchange rate in the last quarter of 2008. By the first eight months of 2009, however, Mexico's share in U.S. imports was still below the one observed before China's entry into the WTO.

²⁶ If we consider the basket of Mexico's competitors as a whole, it has also been gaining share in the U.S. market since 2002. However, if we take China out from the basket, the rest of competitors have been losing market share. In part, this may be driven by the fact that some goods produced within the Asian block may have started to be shipped from China after 2001, whereas in previous years they were shipped from other countries within the block. Thus, part of the apparent market share loss of the rest of Mexico's competitors

In order to evaluate the relevance of the aforementioned events in greater detail, several empirical projects have been conducted within the economic research division of Banco de México in the last few years. A brief summary of the most important findings obtained from these studies is described in the following pages.

Figure 5. Share in U.S. Manufacturing Imports (%)



3.2.1 Mexico's pattern of comparative advantages

We first used the United Nations COMTRADE bilateral trade database to compute revealed comparative advantage indexes for Mexico and for all other countries in the database whose total manufacturing exports amounted to at least 15% of Mexico's total manufacturing exports during the period of analysis.²⁷ These indexes were computed for 263 comprehensive manufacturing categories (three-digit SITC classification) and for the

after 2001 may in fact simply be reflecting a substitution of the shipments' origin. It is relevant to note, however, that to the extent to which the Asian "block" has become more competitive as a whole through a more intensive use of China's labor force, this means that Mexico's comparative advantages may not only be threatened directly by China, but more generally by the increased competitiveness of an Asian production "block".

²⁷ Further details concerning this study, the methodology undertaken and the results obtained are found in Chiquiar, Frago and Ramos-Francia (2007) and in Amoroso, Chiquiar and Ramos-Francia (2009).

period going from 1996 to 2005.^{28,29} Mexico's revealed comparative advantage index for each product category $i = 1 \dots n$, for example, is computed as (see Balassa, 1965 and 1979).³⁰

$$RCA_i^{Mexico} = \left(\frac{X_i^{Mexico} / \sum_{i=1}^n X_i^{Mexico}}{X_i^{World} / \sum_{i=1}^n X_i^{World}} \right) \quad (1)$$

where:

RCA_i^{Mexico} = Revealed comparative advantage index for Mexico in product i .

X_i^{Mexico} = Value of Mexico's exports of good i .

X_i^{World} = Worldwide value of exports of good i .

The interpretation of this index is straightforward: a country is said to be revealing to have a comparative advantage in good i whenever the share of good i in its exports is larger than the share of this good in worldwide exports; that is, whenever the index of this country for good i is greater than one. We estimated these indexes for each year from 1996 to 2005, as well as for the whole 1996-2005 period. The results that follow were not affected by the choice of using the indexes for each particular year or for the full sample period.

We first used these indexes to identify Mexico's main competitors, in terms of the degree of their similarity with Mexico's pattern of comparative advantages. In order to do

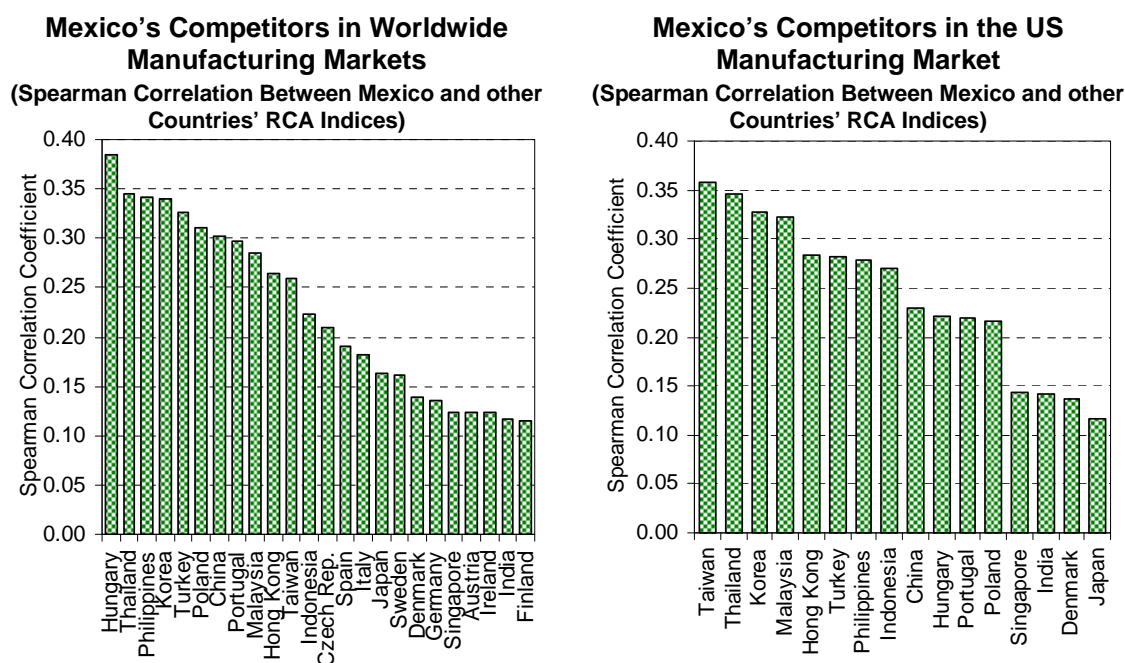
²⁸ The commodity groupings of the Standard International Trade Classification (SITC) are based on the materials used in production, the processing stage, market practices and uses of the goods, the importance of the commodities in terms of world trade, and technological change.

²⁹ As discussed in footnote 25, after 2005 diverse higher-frequency shocks, not necessarily associated with the issues that concern us here, started affecting Mexico's exports behavior. On the other hand, data before 1996 are affected by the Tequila crisis. We therefore chose a sample going from 1996 to 2005.

³⁰ Note that, since revealed comparative advantage indexes are computed using data on observed international trade flows and not on factor endowments or technology, they may be affected by distortions to international trade. For example, a country that subsidizes its exports of a good could seem to have a comparative advantage in such good, even if it doesn't have it given its factor endowments or technology. Similarly, a country that, for diverse distortions in the input markets, is not exporting a good for which it has a comparative advantage, would seem not to have it according to these indexes.

so, we computed the Spearman correlation coefficients of Mexico's 1996-2005 revealed comparative advantage with respect to the rest of the countries. We computed these correlations using two different benchmarks: i) the full worldwide trade volumes; and ii) U.S. imports from each country.³¹

Figure 6. Mexico's main trade competitors



Comparative advantage was computed using 1996-2005 exports of manufactures, disaggregated into 263 categories.
Source: Amoroso, Chiquiar and Ramos –Francia (2009). Elaborated using United Nations' COMTRADE data.

Figure 6 summarizes the results. The left hand side illustrates the countries that exhibit a significantly positive correlation with Mexico's RCA in worldwide trade flows, while the right hand side illustrates the ordering of countries with a significant correlation with Mexico when the analysis is restricted to the U.S. market. Note that the first twelve countries in each listing are the same. On the other hand, Singapore is the thirteenth most important competitor if we restrict the analysis to exports directed to the U.S., even when it appears to be a less important competitor if we take worldwide export flows as a

³¹ According to COMTRADE figures, on average 82% of Mexican manufacturing exports were directed to the U.S. in the 1996-2005 period.

benchmark.³² Given these results, we defined the basket of Mexico's main competitors as Hungary, Thailand, Philippines, South Korea, Turkey, Poland, China, Portugal, Malaysia, Hong Kong, Taiwan, Indonesia and Singapore.³³ China stands out within this group, given the large size of its labor force and, therefore, the degree to which it may displace Mexico's exports in international markets. This is why, in most of the international comparisons we make in this paper, we distinguish China from the rest of Mexico's competitors.

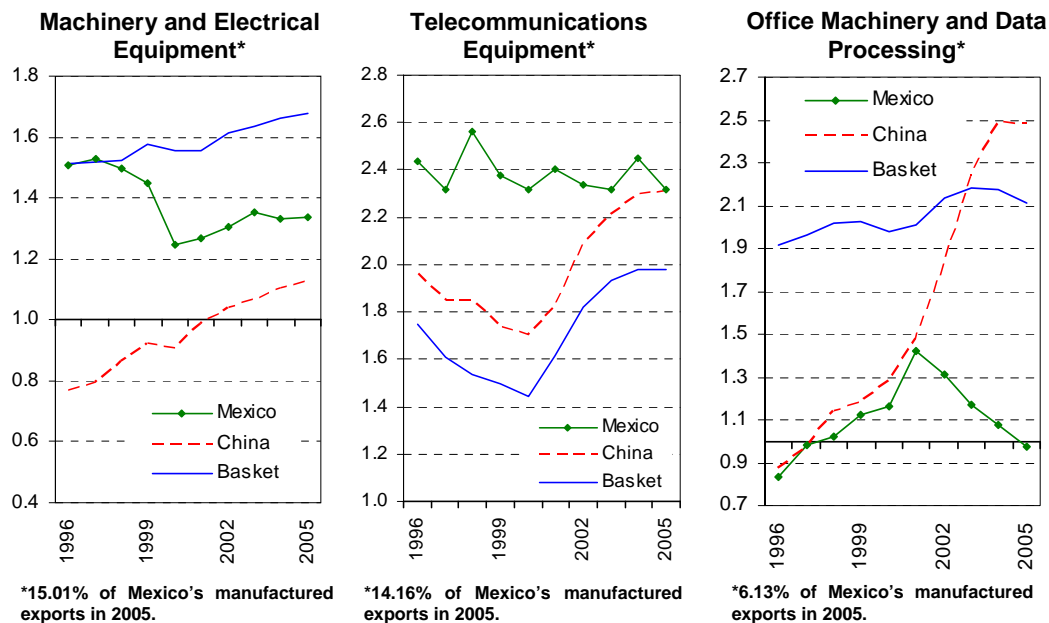
We also used the estimates described above to analyze how Mexico's revealed comparative advantages compare with China's and the basket of Mexico's competitors for specific product categories. Within the most relevant categories, we identified three different groups that amount to around 90% of Mexican manufacturing exports and that differ in terms of the evolution of Mexico's competitive position *vis-à-vis* its competitors.

A first group, representing around 40% of Mexican total manufacturing exports, corresponds to goods in which Mexico seems to have been recently losing its comparative advantage, when compared to China and/or the basket of competitors. This group includes machinery and electrical equipment (15% of Mexican manufacturing exports in 2005); telecommunications equipment (14.2%); office machinery and automatic data processing (6.1%); furniture and parts (3%); and non metallic mineral manufactures (1.3%). Figure 7 illustrates the evolution of Mexico's, China's and the full basket of competitors' revealed comparative advantage indexes for the first three categories of this group. It is possible to note that the basket of competitors has recently overtaken Mexico in the machinery and electrical equipment sector. Meanwhile, by the end of the sample period, China had apparently caught up with Mexico's comparative advantage in telecommunications equipment production. Finally, the case of computers shows dramatically how China recently displaced Mexico in terms of its comparative advantage in a short period of time.

³² However, for most years in the sample, the correlation between Mexico and Singapore's RCA indexes computed with U.S. imports were as high as the ones obtained for other relevant competitors. This is why we chose to keep Singapore in the basket of competitors for the subsequent analysis. The results were qualitatively unchanged if instead we chose to drop Singapore from the analysis.

³³ Apart from the specific consideration mentioned in the previous footnote related to the inclusion of Singapore, this list includes those countries that exhibit a Spearman correlation above 0.20 in the left hand side of Figure 6. Note that several other countries also exhibit a statistically significant, but lower correlation with Mexico (the Czech Republic, Spain, Italy, Japan, Sweden, India, etc.). These countries were not included in the basket. However, the results of the analysis we make in the following pages were found not to be affected significantly if instead we kept these countries in the basket.

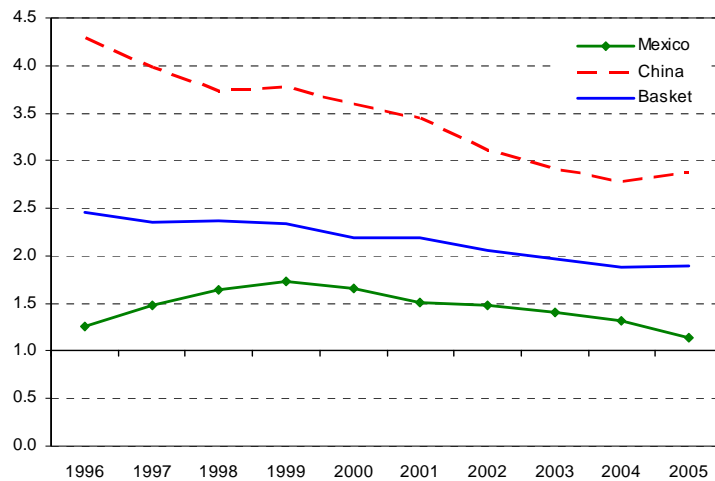
Figure 7. Revealed comparative advantages



Source: Amoroso, Chiquiar and Ramos-Francia (2009). Elaborated using United Nations COMTRADE data.

A second group of products (around 12% of Mexico's manufacturing exports) corresponds to goods in which Mexico does not apparently have a comparative advantage with respect to China and/or its basket of competitors. In these cases, Mexico's export performance during the first years of NAFTA may have been influenced by preferential access to the United States. Thus, the increasing market access of other competitors in the last years could therefore lead to a rapid displacement of Mexico's exports of these goods. Within this second group are included apparel and clothing accessories (4.1%); diverse manufactured articles, such as toys and sporting goods (2.8%); metal manufacturing (2.8%); threads, weaves and articles made from textile fibers (1.3%); construction accessories (0.9%); and photographic equipment (0.4%). Figure 8 illustrates the case of clothing, where Mexico does not appear to have a comparative advantage over China and its full basket of competitors. In this case, the growing market access of China is known to have led to a significant reduction of employment in Mexico's apparel industry after the year 2001 (see Lederman *et al.*, 2006; Gruben, 2006).

**Figure 8. Revealed comparative advantages
Apparel***



*4.05% of Mexico's manufactured exports in 2005.

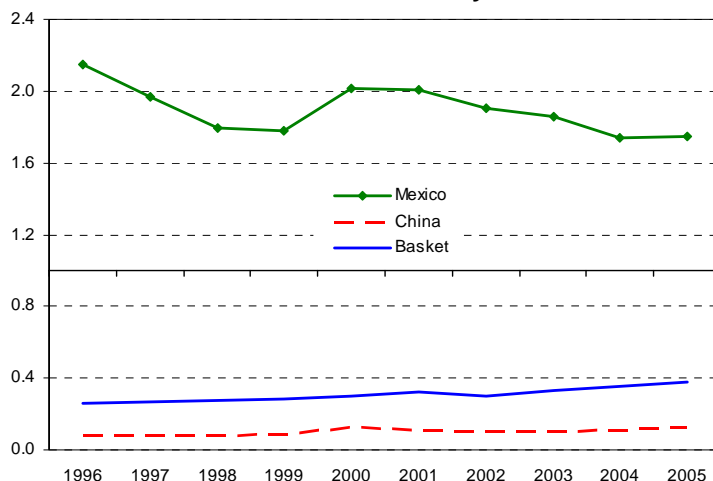
Source: Amoroso, Chiquiar and Ramos-Francia (2009). Elaborated using United Nations COMTRADE data.

Finally, a third group of products, representing around a third of Mexico's manufacturing exports, corresponds to goods in which Mexico apparently maintains a solid comparative advantage and, in particular, seems to be so far free of relevant competition from most countries within the basket of competitors we have defined. This group includes the automobile industry (19.3%); machinery and power generators (4.8%); general machinery and industrial equipment (4.6%); professional, scientific and control instruments (4.6%); and beverages (1.6%). Figure 9 illustrates the case of the automobile industry. Mexico's comparative advantage in this sector seems to be apparently related to the low transport costs to the U.S. market and the lower labor costs with respect to that country (see Moavenzadeh, J. (2008); A.T. Kearney, 2008; Sturgeon *et al.*, 2009). Another factor that may be behind this apparent comparative advantage may be the fact that firms in this sector may face particularly large costs of relocating the plants they currently have in Mexico, in terms of both the high fixed costs of building new plants and the need to generate new business networks in other locations that this relocation would entail.

Two aspects, however, should be emphasized concerning the automobile industry. First, perhaps China and the basket of competitors defined here are not the relevant competitors with which we should be making comparisons. Second, the Mexican automobile industry could indeed become vulnerable if China or India enters the automobile export market. Given the stronger competition that this could bring, Mexico

could try to complement its apparent advantages in terms of labor and transport costs with specific policies that reduce the costs of some other important inputs of this industry (electricity, transportation infrastructure, etc.) and that enhance the attractiveness of Mexico as an investment site for automobile assembly plants (see A.T. Kearney, 2007).

**Figure 9. Revealed comparative advantages
Automobile Industry***



*19.32% of Mexico's manufactured exports in 2005.

Source: Amoroso, Chiquiar and Ramos-Francia (2009). Elaborated using United Nations COMTRADE data.

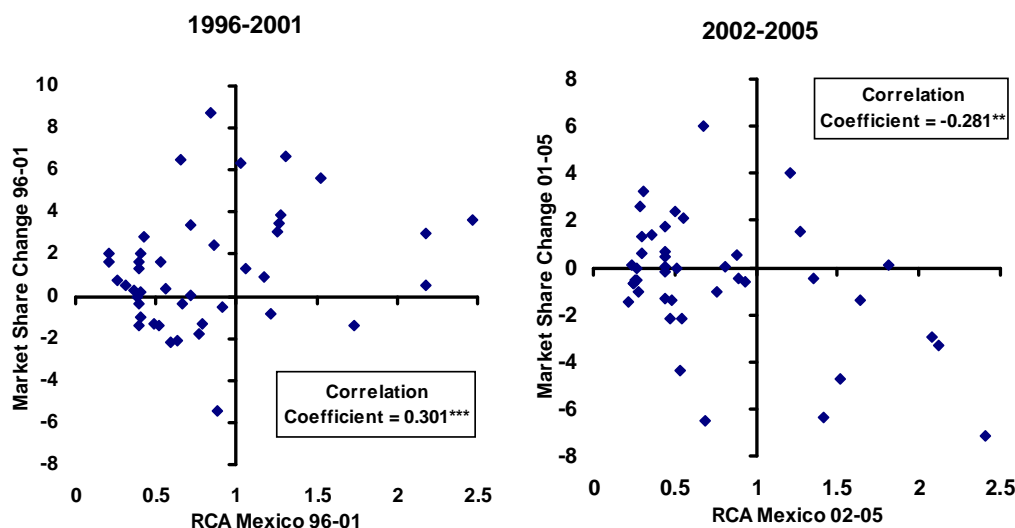
Given the findings described above, it is possible to conclude that around half of Mexican manufacturing exports correspond to product categories in which Mexico could potentially face (or is already facing) a significant displacement in international markets. While part of these categories correspond to products in which Mexico does not have a comparative advantage and, thus, this displacement may be efficient from a welfare point of view, in other categories, Mexico's recent loss of comparative advantage could be reflecting its gradual loss of competitiveness as a consequence of diverse distortions, particularly in the factor markets. We will discuss this hypothesis more thoroughly in the following sections of the paper.

The events described above may be reflecting the fact that, just as Mexico does, some of the countries that have gained market access in the last few years tend to have a relative abundance in unskilled labor. Thus, it is not surprising that these countries have tended to enter the same markets that Mexico went into after its trade liberalization and,

especially, after NAFTA started operating. The large size of the Chinese workforce has made this problem, however, very pressing. In particular, this country seems to have comparative advantages in precisely the types of goods in which Mexico had previously specialized in, given its own pattern of comparative advantages.

The argument made above can be illustrated with the scatter plots depicted in Figure 10, where we show the correlation of Mexico's 1996-2001 and 2002-2005 average revealed comparative advantage indexes with the change in its market share within U.S. imports for these two periods.³⁴ We observe that, from 1996 to 2001, Mexico tended to increase its market share to a larger extent in product categories in which it exhibited a relatively high revealed comparative advantage index. The Spearman correlation coefficient for this relationship is statistically significant at a 1% level. In contrast with the previous period, from 2002 to 2005 Mexico's market share loss was significantly larger in product categories where Mexico had specialized in, suggesting that it is in these precise markets where Mexican producers faced fiercer competition after 2001.

Figure 10. RCA and Change in Mexico's Market Share



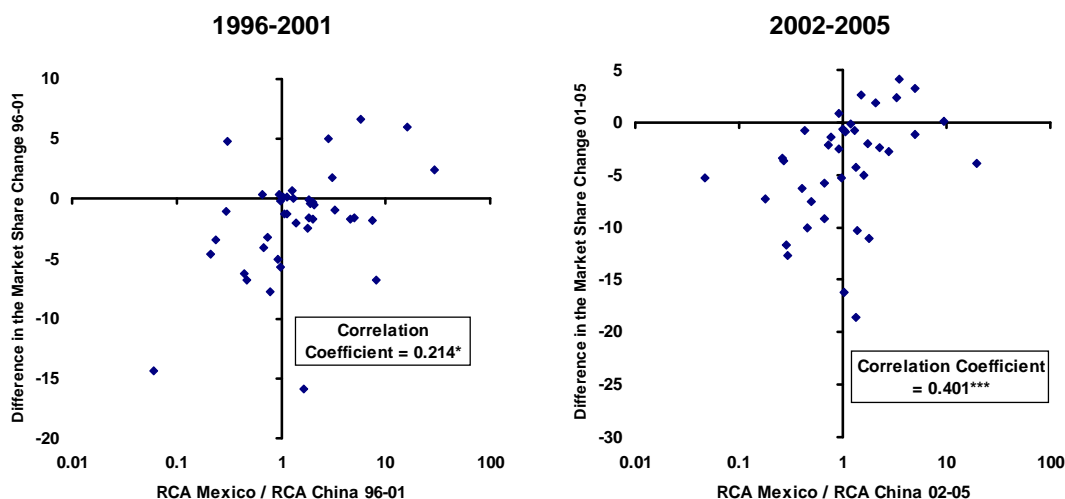
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively.

Source: Chiquiar, Fragoso and Ramos-Francia (2007). Elaborated using United Nations COMTRADE data.

³⁴ These scatter plots were constructed using the computations at a two-digit SITC level (61 manufacturing categories). The results were not different from an analysis made at a three-digit SITC classification level.

These results do not mean that the concept of revealed comparative advantage is irrelevant to determine export performance. Figure 11 again presents scatter plots correlating Mexico's export performance with its average revealed comparative advantages. This time, however, we compare Mexico's revealed comparative advantages, *measured relative to China's*, with Mexico's market share changes, *also relative to China's market share changes*. We may observe that, both before and after China entered the WTO, Mexico had a relatively better market performance in product categories in which its revealed comparative advantage is relatively larger, when compared to China.

Figure 11. Relative RCA and Difference of Mexico vs. China's Changes in Market Shares



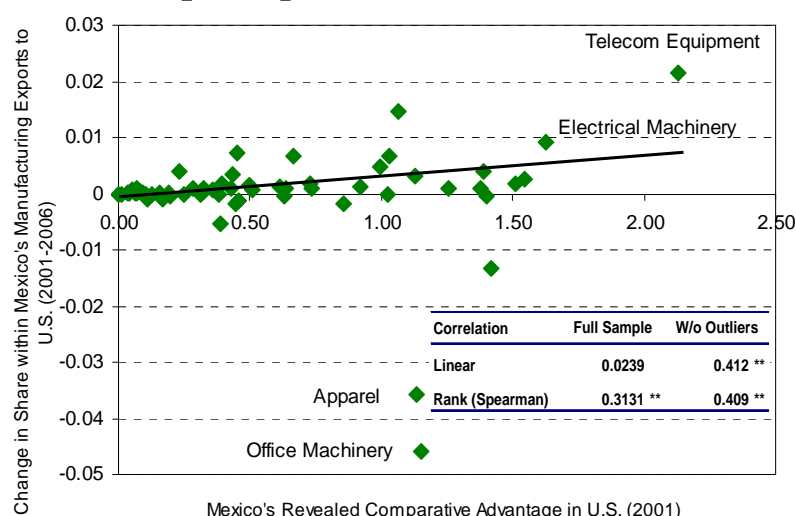
*, ** and *** represent statistical significance at 10, 5 and 1%, respectively.

Source: Chiquiar, Frago and Ramos-Francia (2007). Elaborated using United Nations COMTRADE data.

A relevant question concerning these results is: do these apparent consequences of competition from other countries matter for welfare and growth? Mexico's loss of comparative advantage in some manufacturing activities and, in particular, the terms of trade effects of this shock, would have less adverse effects if markets within Mexico were undistorted and flexible enough to face the shock implied by the entry of new competitors in worldwide markets through an efficient reallocation of resources. Indeed, in that case, we should have expected a reallocation of resources out of the manufacturing activities where Mexico lost comparative advantage into other activities in which a comparative advantage remained.

In relation to this point, Chiquiar and Ramos-Francia (2008) show evidence that, to some extent, the Mexican manufacturing sector indeed reacted to the increase in competition on the U.S. import market by shifting resources towards sectors where it remained competitive. This is illustrated in Figure 12. We plot the change in the share within overall Mexico's manufacturing exports to the U.S. of each of 61 comprehensive manufacturing categories (2-digit level SITC classification) for the period 2001-2006, against the corresponding initial (2001) revealed comparative advantage index within the U.S. market. The figure includes the corresponding linear and Spearman's correlation coefficients. One or two asterisks are added when such correlation coefficients are statistically significant at a 10 or 5% level, respectively.

Figure 12. Mexico's Revealed Comparative Advantages and Export Specialization in the U.S. Market



Note: Based on 2-digit SITC (61 groups)

Source: COMTRADE database, United Nations.

As can be seen, there is a significantly positive correlation between the initial comparative advantage of Mexico in the U.S. market and the growth of exports towards that market in the following 6 years. This correlation seems to be especially strong both if we use the usual linear correlation coefficient and we drop two outliers (apparel and office machinery), which are two sectors that were particularly affected by Chinese competition, or if we use the Spearman's rank correlation coefficient. What these results suggest is that in the years following China's entry to the WTO, Mexico did adjust its export structure in

favor of product categories in which it exhibited a larger comparative advantage index at the time of the shock.

The reallocation of resources described above, however, seems to have been insufficient to avoid Mexico from facing important costs from the entry of other competitors into the manufacturing markets. First, the increased competition from China has not only implied a market share loss of Mexican exports, but also a loss of capital stock, as some plants in footloose industries, such as apparel, stopped operating after China's entry to WTO.³⁵ Furthermore, as mentioned before, the evidence in Levy (2007) and Alcaraz, Chiquiar and Ramos-Francia (2008) suggests that informal services in Mexico, where a part of the labor force has been reallocated into, have lower productivity levels than manufacturing. In this context, the movement of labor from relatively higher-productivity manufacturing to relatively lower-productivity informal services may not only be affecting the overall productivity level of the economy. In fact, as will be seen below, the empirical evidence suggests that Mexico is precisely losing market share against other competitors, such as South Korea, Hong Kong and Taiwan, in exports that may have relatively larger spillover effects. This means that, if labor is moving towards sectors that do not exhibit such externalities, the reallocation of labor in the Mexican economy may be implying a reduction of long-run growth (see Hausmann, Hwang and Rodrik, 2007). Finally, as we will show in the following section, Mexico's competitiveness and export performance may not only be reflecting true differences between Mexico and other countries in terms of factor endowments or technology, but may also be partly a result of distortions in the markets for inputs that are relevant for production, such as financial services, telecommunications and energy. In this case, the patterns of comparative advantage (and, thus, export performance) could be distorted by the presence of input market imperfections. In this context, there could be scope for public policies directed towards the correction of these distortions.

³⁵ According to data from INEGI, between July 2001 and December 2006 the number of maquiladora plants diminished from 3735 to 2783. 70% of this reduction corresponds to the closure of plants in the apparel sector.

3.2.2 Determinants of Mexico's comparative advantages and export performance

Given the results above, we attempted to identify the determinants of Mexico's revealed comparative advantages and of its export performance to the U.S. In particular, we tried to determine if the pattern of Mexico's revealed comparative advantages and its export performance are related to Ricardian-type productivity differentials with respect to its main competitors, or to differences in factor requirements across sectors, which in turn would suggest a factor-endowment explanation of this country's trade patterns.³⁶

To conduct this study, we complemented the estimates of revealed comparative advantage obtained in the study described before with estimates of TFP levels for each of 39 comprehensive manufacturing industries and for each of the countries analyzed in this research agenda.³⁷ The period was chosen to match as closely as possible the years for which we computed revealed comparative advantage indexes. Limitations from the sources used, however, implied that we had to compute these productivity measures only for the 1997-2002 period. We used the Mexican data to compute the capital share in value added and the mean wage rate of each sector, relative to all manufacturing, in order to use these as indicators of the physical and human capital intensity of each manufacturing activity.³⁸

For this analysis, we divided the basket of competitors (not including China) into two groups: a High-Tech group, which includes Taiwan, Hong Kong, Singapore and South Korea, and a Low-Tech group, including the remaining countries. The criterion to do this separation was that the High-Tech countries are those that, given the estimates made for this study, currently have higher overall TFP levels in manufacturing than Mexico.

Once we estimated the variables described above, we ran two sets of regressions, where each data point corresponds to the time-averaged values of the relevant variables for each of the 39 manufacturing sectors.³⁹ The first set of estimated equations related the log of Mexico's revealed comparative advantages, relative to those of its competitors, with the log of the ratio of Mexico to its competitors' sector-specific productivity levels and with the

³⁶ See Amoroso, Chiquiar and Ramos-Francia (2009) for further details concerning the sources, methodology and results of this study.

³⁷ The number of distinct manufacturing industries had to be reduced to 39 in order to be able to match the information of different countries, which comes from different sources.

³⁸ We tested an extended Heckscher-Ohlin specification, in which we also included electricity and transport as additional factors of production. The variables intended to measure the intensity of these factors did not appear significantly in the regressions and did not lead to any qualitative change in the results.

³⁹ For the regressions in which we compare Mexico with China, we only consider the period after China entered the WTO for the RCA and market performance measures.

variables used to approximate the factor intensities in each sector. These regressions were run separately for i) Mexico vs. China; ii) Mexico vs. High-Tech competitors; and iii) Mexico vs. Low-Tech competitors.⁴⁰ The results are summarized in the first three columns of Table 2. The second group of regressions, which is summarized in the last three columns of the table, is similar, although in this case the dependent variable is a measure of relative export performance with respect to China or to a basket of competitors, defined as:

$$\text{Mexico's relative export performance in good } i = \frac{\Delta X_i^{\text{Mexico}} - \Delta X_i^{\text{Competitor}}}{X_i^{\text{Mexico}} + X_i^{\text{Competitor}}} \quad (2)$$

The results suggest that, when we compare Mexico with China, what drives relative comparative advantages and export performance are sector-specific productivity differentials. That is, according to the results, Mexico seems to have significantly larger revealed comparative advantage indexes and a better market performance, in both cases relative to China, in those sectors where its productivity differential with respect to China is larger. In contrast, the variables measuring capital and human capital intensities do not appear significantly in the regressions. In effect, we have a Ricardian-type explanation of these trade patterns. This could reflect the fact that, when we compare Mexico and China, we are considering two countries that have similar relative factor endowments.

In contrast with the above, when we compare Mexico with the High-Tech basket, both productivity differentials and Heckscher-Ohlin determinants seem to explain relative comparative advantages and export performance. In effect, in combination with productivity differentials, the degree of physical and human capital intensity seem to be significant determinants of relative comparative advantages and market performance, respectively.⁴¹ In particular, the results suggest that Mexico's comparative advantages and export performance, when compared with competitors that have been able to "move up the ladder" towards higher skill-intensive goods, reflects both productivity differentials and the

⁴⁰ Given the difficulty to obtain reliable data on capital stocks for China, in the regressions we used labor productivity differentials when comparing Mexico with China. For the high- and the low-tech baskets, we use TFP differentials in the regressions. A more complete set of results is found in Amoroso, Chiquiar and Ramos-Francia (2009).

⁴¹ Human capital also seems to be a relevant determinant of relative comparative advantages, but its coefficient is estimated imprecisely in the RCA equation (its p-value is 0.11). In contrast, the physical capital variable only appears significantly in the RCA equation.

fact that Mexico may currently have a relatively smaller endowment of physical capital and, especially, of skilled labor, as compared with those countries.⁴² This may in turn be reflecting the lower investment levels in physical and human capital that have been observed in Mexico during the past decades.⁴³

**Table 2. Determinants of Revealed Comparative Advantages and of Market Performance
(Country Pair Comparisons)**

Dependent Variables	$\ln \left(\frac{RCA_i^{Mex}}{RCA_i^{Ch}} \right)$	$\ln \left(\frac{RCA_i^{Mex}}{RCA_i^{BasketH}} \right)$	$\ln \left(\frac{RCA_i^{Mex}}{RCA_i^{BasketL}} \right)$	$\frac{\Delta X^{Mex} - \Delta X^{Ch}}{X^{Mex} + X^{Ch}}$	$\frac{\Delta X^{Mex} - \Delta X^{BasketH}}{X^{Mex} + X^{BasketH}}$	$\frac{\Delta X^{Mex} - \Delta X^{BasketL}}{X^{Mex} + X^{BasketL}}$
Independent Variables						
$\ln \left(\frac{productivity_i^{Mex}}{productivity_i^k} \right)$	0.8127* (2.02)	0.5959* (1.91)	-0.0641 (-0.46)	0.6839* (1.91)	1.5588** (2.23)	0.4355** (2.08)
Capital Intensity	-1.7469 (-1.10)	-3.8512** (-2.04)	-1.5838 (-1.07)	-2.2021 (-1.49)	2.6201 (0.69)	-2.9644 (-1.26)
Human Capital Intensity	0.0529 (0.14)	-0.6368 (-1.62)	0.5748** (2.15)	-0.6523 (-1.44)	-3.1257** (-2.68)	0.5100 (1.27)
Constant	-1.3017 (-1.52)	1.4742** (2.51)	-0.4676 (-0.82)	-0.3919 (-0.64)	2.3414*** (2.81)	0.4256 (0.59)
R ²	0.1696	0.1873	0.0946	0.1264	0.3725	0.2443
Adjusted R ²	0.0984	0.1176	0.0170	0.0516	0.3187	0.1795
Prob. F	0.0254	0.0299	0.1126	0.1961	0.0314	0.0880

Note: i=good, k=China, Basket L and Basket H respectively.
 *, **, *** indicate statistical significance at 10, 5 or 1 percent, respectively.
 Source: Amoroso, Chiquiar and Ramos-Francia (2009).

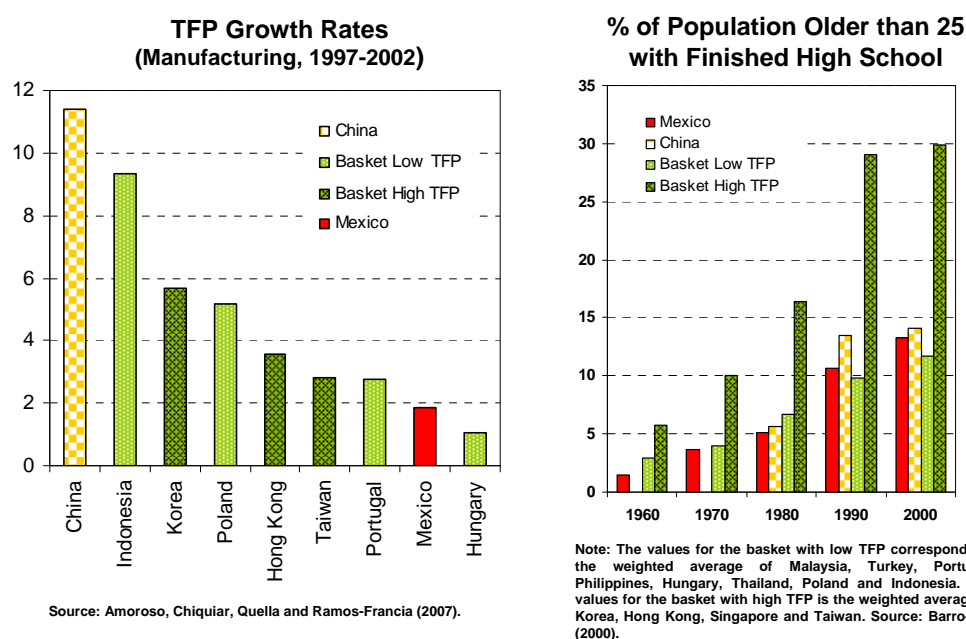
⁴² Costinot (2007) suggests that institutional quality and human capital are complementary sources of comparative advantage in industries requiring more complex processes. It is important to emphasize again that, while human capital levels may be thought of as relevant determinants of trade patterns and of growth, they should be ultimately considered as endogenous to the incentives to invest in schooling and, in particular, to the institutional framework. Thus, even if the promotion of human capital accumulation may be an important policy to increase growth, the ultimate booster of development may be related to institutional reform (Vogel, 2006).

⁴³ Mexico's insufficient human capital formation is not only explained in terms of the relatively low average schooling attainment levels of its population, as depicted in Figure 13, but could also be a reflection of the relatively low quality of its schooling system. For instance, Mexico is ranked last within the OECD countries in terms of student performance, as measured by the OECD's Programme for International Student Assessment (PISA) tests. The low performance of Mexico's students in these tests, as compared with all the other countries, stands out if we take into account that Mexico spends a comparable percentage of GDP in education as the average of OECD countries (see OECD, 2007a and 2007b). In this context, a misallocation of resources in the human capital investment sector may have a large impact on output levels; see Manuelli and Seshadri (2007).

Summing up, the results from this study suggest that Mexico's revealed comparative advantages and export performance, when compared to its main competitors, reflect productivity differentials and, in part, the relatively smaller endowment of physical and, especially, human capital in the country. This situation could become more pronounced in the future, if we note that Mexico tends to exhibit smaller TFP growth rates and has accumulated human capital at a slower pace than its competitors, especially those that have attained higher TFP levels (see Figure 13).⁴⁴

Again, it is relevant to ask if this matters for growth. Given the arguments in Hausmann, Hwang and Rodrik (2007), it is indeed possible to think that this situation may be relevant for Mexico's growth performance. According to these authors, a higher human capital intensity tends to be associated with goods that have larger growth effects and, in this context, precisely Hong Kong and South Korea, for example, seem to have an export mix that appears to be more conducive to growth than Mexico's.

Figure 13. Productivity growth and schooling attainment



⁴⁴ Some relevant countries' TFP growth rates could not be included in the left panel of Figure 13, due to a lack of a sufficiently long data series to compute long-term TFP growth rates.

3.2.3 Competition, technology adoption and TFP growth

A third study forming part of this research agenda (Salgado and Bernal, 2007) tried to identify the effect that product market competition may have on technology adoption and on TFP growth within Mexican manufacturing industries. In particular, TFP levels were estimated for each of 205 manufacturing activity classes and for each year from 1996 to 2003. Technology adoption, in turn, was measured as the ratio of expenditures on technology transfer and royalties to value added. Finally, the Herfindahl-Hirschman index was used as a measure of market concentration, which in turn is assumed to be inversely related to the degree of product market competition.⁴⁵ After computing these variables, a dynamic panel data GMM estimator (Blundell and Bond, 1998) was applied to a model intended to explain the behavior of technology adoption and TFP growth. This method controls for time-invariant unobserved effects and for the possible endogeneity of regressors, and is appropriate when the lagged dependent variable appears as an explanatory variable.

The results are summarized in Table 3. The first column corresponds to the equation for technology adoption, while the second summarizes the estimates of the equation for TFP growth. Note that the degree of market concentration in each sector is allowed to have both a direct effect on TFP growth (after controlling for technology adoption) and an indirect effect, which works through the impact that concentration may have on technology adoption, which in turn may have an impact on TFP growth. Controls for physical capital, human capital, electricity and transport intensities are included in the regressions as well.⁴⁶

As may be noted, the results suggest that there seems to be a “Schumpeterian” type of effect of market concentration on technology adoption. Indeed, the coefficient of the concentration index in the technology adoption equation is significantly positive at a 5%

⁴⁵ Concentration indexes, such as the Herfindahl-Hirschman index used here, could in some circumstances be misleading to assess the true degree of competition in the markets. In particular, the Herfindahl-Hirschman index cannot account for market segmentation or contestability (see Baumol et al., 1982), and is bounded by a geographic definition that might not be relevant if competition is exerted at an international level (see Aghion et al., 2005). This study is therefore currently being extended to analyze the robustness of the results to alternative measures of market competition.

⁴⁶ Note that the Sargan tests and the Difference Sargan tests of over-identifying restrictions, as well as the m_1 and m_2 tests for first and second-order serial correlation in the first differenced residuals, suggest that the instruments are valid and that the assumption that the levels equation error term does not present serial correlation is appropriate. Recall that this last assumption implies that one should find first-order serial correlation, and no evidence of second order serial correlation, in the differenced residuals. For further details, see Blundell and Bond (1998).

confidence level. This could suggest that competition in the product markets would seem to inhibit the incentives to technology adoption. However, once we look at the results on the second equation, it is clear that this is not the whole story. Indeed, the estimates suggest that, once controlling for expenses on technology adoption, which do seem to have a positive impact on TFP growth, the direct effect of market concentration on TFP growth is negative and quantitatively large. In fact, if we add up the direct and indirect effects of concentration on TFP growth, the results suggest that, on net, a larger market concentration is associated with lower TFP growth.

**Table 3. Determinants of Technology Adoption and Productivity
(Dynamic Panel Data)**

	Δ Technology Adoption	Δ TFP
Independent Variables:		
Δ Capital Intensity	-0.025 * (-1.65)	-1.510 *** (-4.75)
Δ Electricity Intensity	0.006 (0.18)	0.858 (0.095)
Δ Transport Intensity	0.017 (1.13)	-0.398 (-1.11)
Δ Technology Adoption		1.019 * (1.85)
Δ Concentration	0.027 ** (1.96)	-0.382 *** (-2.75)
Δ Human Capital Intensity	-0.002 (-0.47)	0.119 ** (2.24)
Δ TFP (-1)		0.792 *** (18.3)
Δ Technology Adoption (-1)	0.724 *** (12.7)	
Sargan Test ^o	0.777	0.596
Diff Sargan Test ^o	0.738	0.961
m1 ^o	0.008	0
m2 ^o	0.323	0.637

^o p values. Corrected two-steps t-statistic in parentheses.

*, **, *** indicate statistical significance at 10, 5 or 1 percent, respectively.

N=205, T=8. Time dummies included.

Source: Salgado and Bernal (2007).

Thus, it is possible to conclude that, even if market concentration would appear to promote technology adoption, which in turn may have a positive impact on TFP growth, the additional side effects of market concentration on TFP growth, which could be related to allocative and productive inefficiencies, tend to offset this effect and, therefore,

apparently lead to an overall negative impact on growth. These results tend to be consistent with the findings in Nickell (1996), Okada (2005) and Aghion *et al.* (2005) and may have relevant policy implications. In particular, as in Aghion and Griffith (2005), the results suggest that limiting competition in the product markets may not be the most efficient mechanism to promote innovation.⁴⁷ In fact, the results would suggest that there are complementarities between patent protection policy (to promote innovation) and antitrust policy (to avoid the negative side effects of a lack of competition on growth).

It is relevant to note that the results described above correspond mainly to the effect of market concentration on productivity in the case of product markets. As we will see in the next section, it seems that the lack of competition and its detrimental effects on productivity is an apparently even larger problem in the case of basic input markets.

4 Some examples

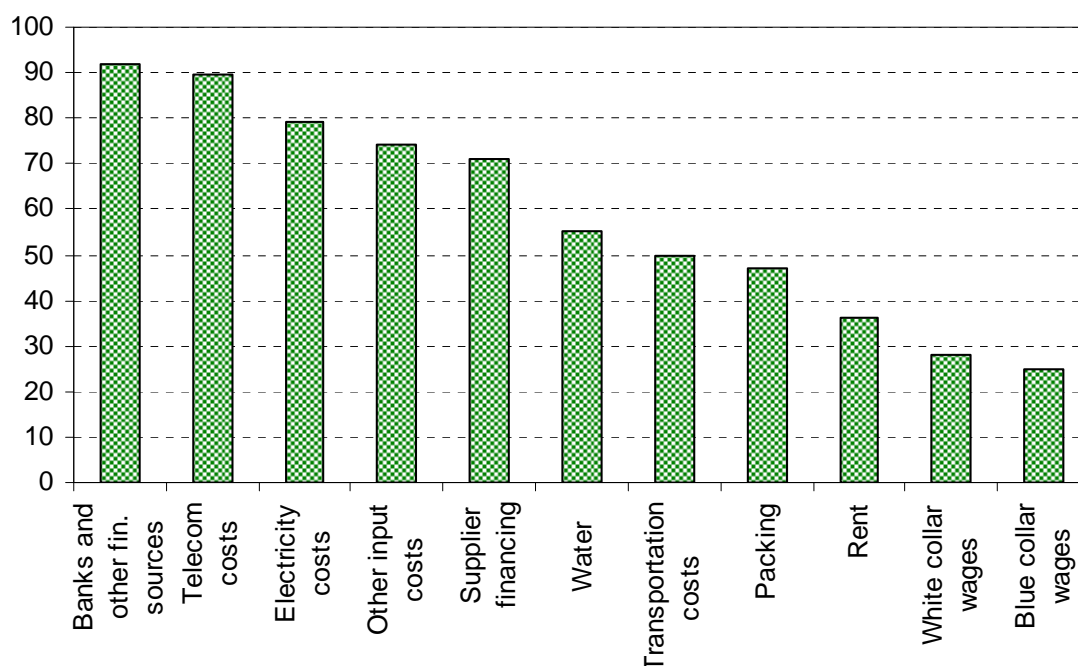
In this section, we briefly analyze the markets of some inputs that could be affecting significantly the competitiveness of the Mexican economy. In order to choose the specific sectors we illustrate, we used the results from a survey that Banco de México and the Secretaría de Economía conducted in 2007 within the group of firms that receive foreign direct investment flows (see Banco de México, 2007a). 202 firms, which contributed with close to 50% of foreign direct investment flows during 2007, responded the survey. Among other issues, these firms were asked to identify which cost components are relatively more expensive in Mexico than in other countries that compete with Mexico to attract investments. As we may observe in Figure 14, the main cost components in which Mexico appears to be most unfavorably rated correspond to banking and other financial services, telecommunications and electricity provision. We therefore briefly analyze some aspects of the markets of these three particular sectors in the following pages.

It is important to note that these sectors tend to be characterized by relatively inelastic demand and supply functions, and exhibit many of the features of the so-called network industries (see Shy, 2001). In this context, it is usually an important challenge to achieve appropriate regulatory frameworks for this kind of sectors. In particular, in the

⁴⁷ Boldrin and Levine (2008) show that, under certain assumptions, innovation activities can take place even in the complete absence of monopoly power.

absence of proper regulation, dominant suppliers in these sectors may capture a large share of the market, which allows them to offer the service at higher prices and lower quality.⁴⁸ Indeed, the dominant suppliers may limit generalized access to inputs and exploit externalities that can be used to erect barriers to entry for other industry suppliers and to design strategies to extract rents at the expense of consumers and the competitiveness of industries using these inputs intensively. This makes the presence of a regulatory framework that avoids barriers of entry, guarantees non-discriminatory access to the network and induces competitive pricing, especially relevant.

Figure 14. Production Costs in Mexico vs. Other Countries that Compete for FDI
 (% of Responses in which Mexico is more Expensive)



Source: Banco de México (2007a).

In this context it is clear that, to make deep assessments concerning the specific situation in each of these sectors, an integral study with much more detailed and exhaustive analyses would be needed. We bypass this need here by simply focusing on data from

⁴⁸ While it is no longer the case that these sectors are generally thought to represent natural monopolies (in fact, in many countries competition in these sectors has been promoted; see Shy, 2001), it is still the case that the high level of fixed costs and, thus, of economies of scale, tend to lead to a high degree of concentration in these sectors.

official sources and international organizations, in order to make international comparisons of prices, quantities and qualities of service in these industries. This allows us to show that the differences between Mexico and other countries are large and clear enough to conclude that this country still seems to require undertaking important steps towards the achievement of a more competitive supply of these services. It is important to emphasize, however, that given the approach we take, the discussion should be taken only as illustrative.

4.1 Banking sector

A developed financial system and, in particular, a competitive supply of financial services to savers and borrowers, are fundamental factors for an efficient allocation of resources, which allows a country to converge to the technological frontier (see Aghion, Howitt and Mayer-Foulkes, 2005) and to improve the population's welfare by allowing households to smooth consumption paths and the purchase of physical assets. In this context, the evidence suggests that the development of the financial system promotes economic growth (e.g. Rajan and Zingales, 1998). In the case of Mexico, diverse actions have been undertaken in the last few years to improve the regulatory framework of its financial sector. Among other actions to foster competition, we may highlight regulations intended to increase transparency concerning interest rates and commissions, to reduce barriers of entry of new banks and to ease access to payment systems' networks for a larger number of market participants (see Comisión Federal de Competencia, 2007).⁴⁹

Although in the last years significant improvements have been observed in terms of a higher penetration of financial services and a gradual decrease in market concentration, these still compare unfavorably with many other countries, including those with which Mexico competes more directly in the international markets (see Figure 15).⁵⁰ This lag calls for a renewed effort to guarantee a competitive supply of financial services in the country.

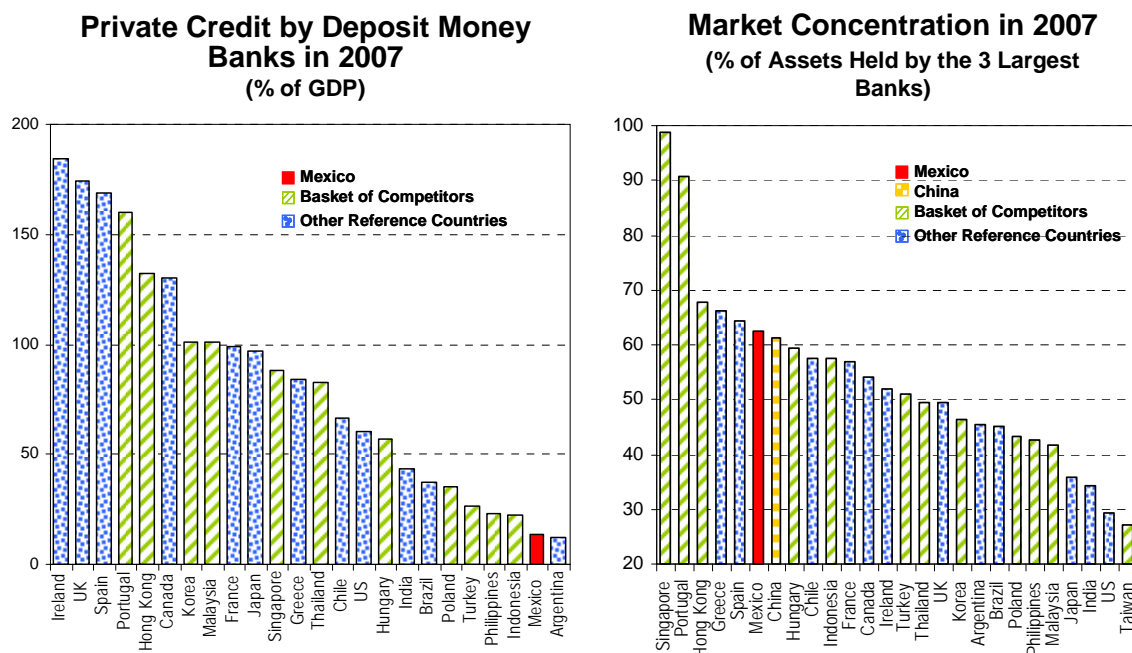
The reduction that has been observed in banking operative costs and in interest rates paid to depositors, as a result of larger operation volume, operative efficiency gains and favorable macroeconomic conditions, were not fully reflected as improvements in credit conditions for borrowers and, in particular, as lower lending interest rates to households.

⁴⁹ Comisión Federal de Competencia (COFECO) is Mexico's antitrust agency.

⁵⁰ A more detailed set of figures related to the increase in penetration of financial services and the gradual decrease in market concentration, as well as diverse international comparisons, may be found in Comisión Federal de Competencia (2007).

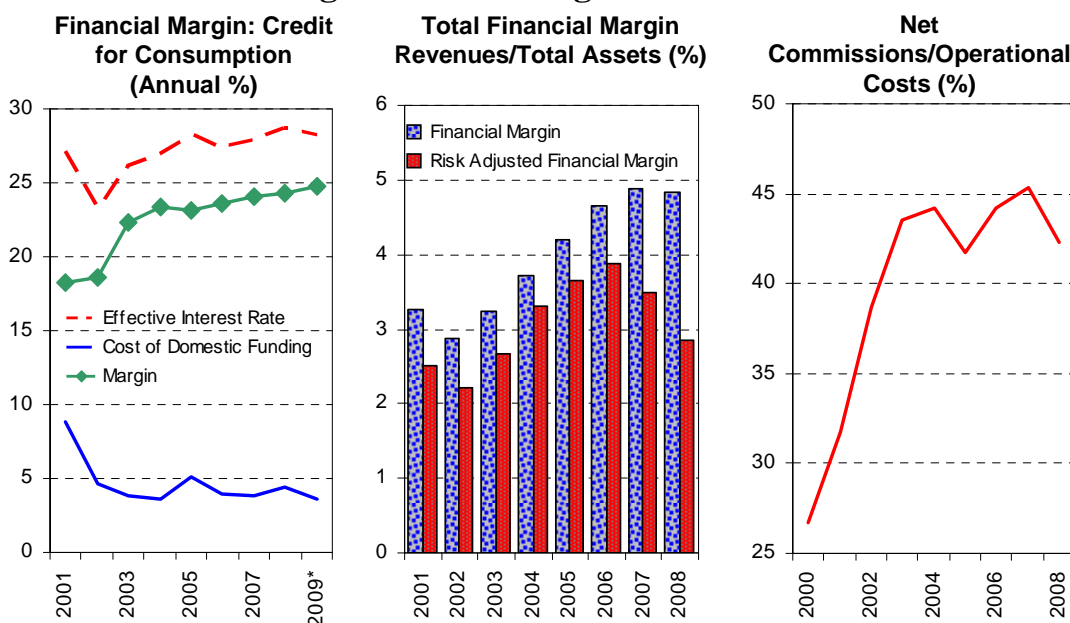
Instead, the reduction in costs mostly led to increases of the system's overall profitability margins. This is illustrated in Figures 16 and 17.

Figure 15. Banking Sector Penetration and Market Concentration



Source: World Bank, A New Database on Financial Development and Structure. Revised in May 2009. For details see Beck, Demirgüç-Kunt and Levine (2000).

Figure 16. Banking Sector Prices



*With data up to the second quarter of 2009.

Source: Banco de México and Comisión Nacional Bancaria y de Valores.

Regarding the behavior of prices, as shown in Figure 16, the persistently high effective interest rates for consumption credit, in a context of a decreasing cost of domestic funding by banks, have led to an increasing trend in the margin between these rates. On the one hand, the wide financial margin in consumption credit allowed banks to assume the risk of increasing penetration in the credit card market to segments of the population without previous credit history. On the other, households who enjoyed a loosening of the tight credit constraints they faced before were willing to pay high interest rates.⁵¹ Up to 2006, the total banks' financial margin revenues were increasing, even when adjusting the figures for risk. Nonetheless, even before the deterioration of the financial conditions in September 2008, higher delinquency rates and write-offs contributed to reduce the risk-adjusted financial margin revenues.⁵² In addition to high margins, banks have also enjoyed increasing markups for the services provided. In effect, as illustrated in the figure, net commissions revenue as a percentage of operational costs increased substantially until 2007.

Figure 17, in turn, summarizes an international comparison of the profitability and the operative efficiency of banking systems. As mentioned, the trends described above have led to high profitability margins, which have risen in the last few years to levels well above international standards. As may be seen in the figure, the extraordinarily high profitability of the Mexican banking system stands out, despite its relatively low efficiency levels, when compared to those observed in many other countries.⁵³

The combination of low penetration and high price of services, profitability and concentration levels, led Mexico's antitrust agency to issue an opinion concerning the apparent lack of competition in the market for retail banking services (see Comisión Federal de Competencia, 2007).⁵⁴ According to this document, this lack of competition, in turn, reflects several distortions:

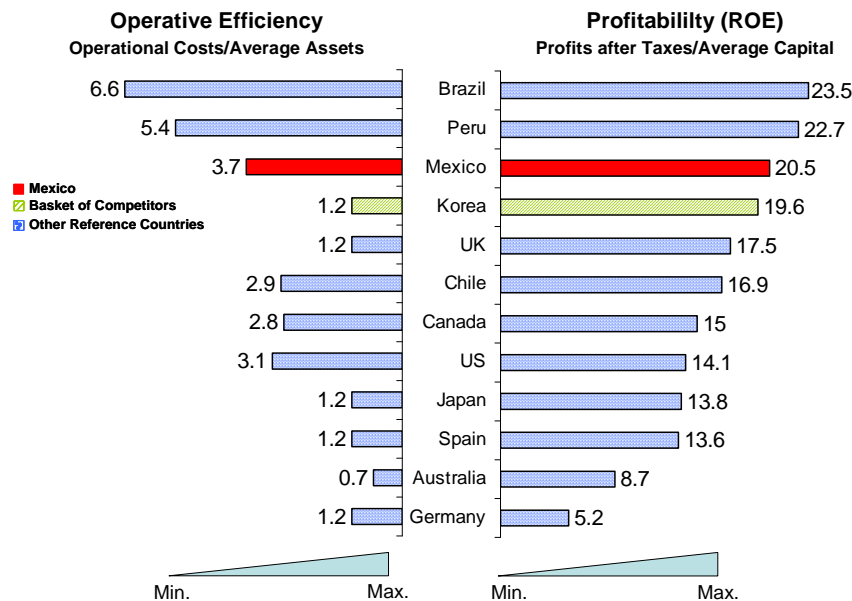
⁵¹ Obviously, the relationship between the financial margin and the risk undertaken works in both directions and a higher portfolio risk also implies wider interest rate spreads.

⁵² The risk adjusted financial margin is the financial margin adjusted by the change in the estimate for preventive credit risk.

⁵³ Other countries where we also observe high profitability, in a context of relatively low efficiency, are Brazil and Peru.

⁵⁴ According to Claessens and Laeven (2003), the degree of entry restrictions, and not market structure or profitability measures, is what determines the competitiveness of the financial markets. Similar conclusions as those of the COFECO are reached if a contestable markets approach is used, however. See Avalos and Hernandez Trillo (2006).

Figure 17. Banking System Efficiency and Profitability



Data for 2005. Source: Comisión Federal de Competencia (2007).

- a) On the demand side, the degree of heterogeneity of services and, in particular, the banks' strategy of offering heavily differentiated products and complex cost structures, makes it difficult for customers to compare the effective price of the services offered by banks. Furthermore, the presence of switching costs restricts the ability of customers to take advantage of cost differentials, even in cases when these differentials can be identified. These features may cause the demand in some segments of the market to exhibit a relatively low price elasticity and, thus, may lead financial intermediaries to set high markups.
- b) On the supply side, an oligopolistic structure persists in several market segments. This, in turn, may reflect barriers to entry, and may be facilitating the exercise of monopolistic practices in detriment of the consumers' welfare. Additionally, an important limitation to competition that persists is the discriminatory access to the low-value payment system infrastructure, in detriment of small and new players in the system.⁵⁵

⁵⁵ A payment system is a set of instruments, banking procedures and interbank transfer systems that allow the circulation of money. These systems are classified as high-value systems and low-value or retail systems. The

Indeed, the apparent presence of barriers to entry, along with the low price elasticity that customers exhibit in some market segments, appear to be fundamental factors affecting competitiveness in the market. In particular, the lack of competition, as manifested through high concentration of the main players and high prices to customers, is especially evident in market segments where the participation of non-bank intermediaries is more limited, and where consumers may be less price-elastic.⁵⁶ As can be seen in Figure 18, the degree of market concentration and the level of borrowing costs are substantially higher in the credit card market, where these non-bank intermediaries have not yet entered as relevant competitors, than in the mortgage and automobile credit markets, where they have represented a larger competitive pressure to banks and consumers may have larger incentives to compare thoroughly prices and conditions, thus exhibiting a larger price elasticity.⁵⁷

Reflecting the diagnosis summarized above, COFECO's opinion included a series of recommendations that intend to act on these market imperfections: i) actions to improve transparency and facilitate the comparison of different products (compulsory introduction of standardized savings and payments products, the inclusion of cost information in the statements of account, the implementation of frame contracts for the most common products, etc.); ii) actions to reduce switching costs (compulsory unrestricted offer of bill payment services, the establishment of rules that allow employees to transfer their payroll deposits to the bank of their choice, among others); iii) actions to diminish barriers of entry (a reduction of the minimum capital required to open a bank and decoupling this minimum capital from the size of the banking system); and, iv) actions to guarantee a non-

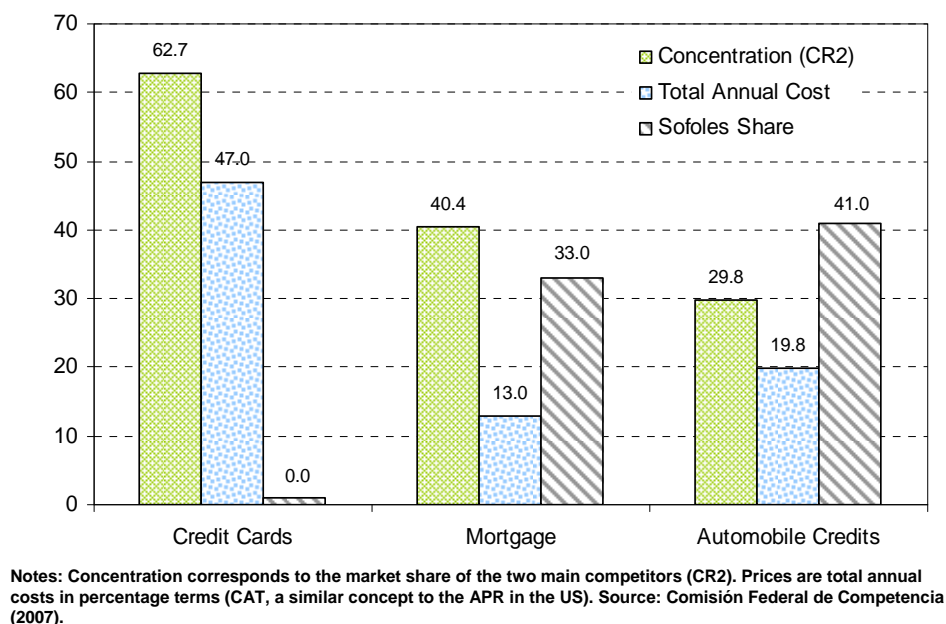
high value systems are mainly used to liquidate transactions between financial institutions. In these systems Banco de México has taken measures to reduce transaction fees and to open access to the system to non-bank financial institutions. Low-value or retail payment systems are used to liquidate transactions between individuals and firms and individuals, mainly checks, electronic transfers and payment cards (credit and debit). One of the main obstacles to competition in the low-value system is the vertical integration of the payment card switches (compensation chambers) with banks, which has generated discriminatory access to the use of the network between partners and non partners.

⁵⁶ The most important non-bank intermediaries are Sofoles and Sofomes. Sofoles correspond to financial institutions with a limited scope. In particular, they may only offer specific types of credit, such as for automobile or home purchases. This figure was created in June of 1992. The Sofomes figure, created in 2006, has a broader scope for credit provision and a lower regulatory burden. In fact, a migration of Sofoles towards the newly defined Sofome figure has been taking place and is expected to continue in the future. Given their broader scope, Sofomes may eventually become more helpful to enhance competition in the retail market of financial intermediation.

⁵⁷ Avalos and Hernandez Trillo (2006) also find an apparent lack of competition in the credit card segment and a higher degree of competition in the mortgage and automobile credit markets.

discriminatory access to the financial system's network (implementing regulation that guarantees non-discriminatory access to low-value payment systems, reinforcing supervision of inter-bank commissions to avoid obstacles to the entry of new competitors).⁵⁸

Figure 18. Concentration, Prices and Sofoles Share in Consumer Credit Market, 2006



After COFECO's opinion, issued on April 2007, and along the lines of its recommendations, the legal framework that regulates bank competition and the protection of customers has undergone several amendments, such as the ones included in the *Ley para la Transparencia y Ordenamiento de los Servicios Financieros* (LTOSF).⁵⁹ The current legal framework now provides Banco de México with enhanced authority to promote competition in banking services. Banks are now required to inform Banco de México about any changes in commissions and fees charged for their services before their implementation.

⁵⁸ Further details may be found in Comisión Federal de Competencia (2007).

⁵⁹ The LTOSF is similar to U.S.'s Truth in Lending Act. Additional amendments were made to the *Ley de Instituciones de Crédito* (law governing credit institutions), *Ley de Protección y Defensa al Usuario de Servicios Financieros* (law on protection and defense to the users of financial services) and the *Ley de la Comisión Nacional Bancaria y de Valores* (law governing the National Banking and Securities Commission).

Reflecting the reforms to the sector, several actions have been undertaken to reduce distortions on the demand side and to increase substitutability between financial services. First, when agents have no complete and transparent information about the actual services received and their respective costs, their ability to compare between different products is hindered. In this respect, Banco de México has been adopting a series of measures to promote transparency and improve the available information about prices and commissions.⁶⁰ It is now compulsory for banks to publish, by different means, information about the costs of their products in a standardized fashion to facilitate comparison between bank products with different cost structures.⁶¹ In the credit card market the different risk profiles generate a wide dispersion of interest rates. To improve transparency and facilitate comparison of these rates, Banco de México is publishing information on the distribution of credit cards' interest rates by financial intermediary. A related measure to facilitate comparison between heterogeneous deposit products was to require banks to offer standardized payroll and current accounts, with a reduced number of commissions to the low income population.

Second, enhancing the possibility of customers to substitute between providers of banking services also requires a reduction in switching costs. Thus, other reforms have been aimed to prevent practices that can increase these costs. For capital amortization, interests, commissions and other fees, credit institutions must receive unrestricted means of payment, including cash, cleared checks, and transfers from other banks. This measure reduces the possibility of banks to force customers asking for credit to purchase deposit services. An additional switching cost that prevailed was in payroll accounts, where employers chose the provider of the service, while employees faced a cost of changing their resources to other bank. In this respect, the portability of the payroll was implemented, and employees are now allowed to transfer their resources, without a fee, to the bank of their choice. Finally, Banco de México issued regulation explicitly forbidding fees that deterred

⁶⁰ For detailed information of some of the measures undertaken, see Banco de México (2007b, 2008, 2009a and 2009b).

⁶¹ For each credit product, banks and other credit intermediaries must publish their Costo Anual Total (CAT). CAT is estimated with the same methodology than the Annual Percentage Rate (APR) of the United Kingdom. The published costs should use the relevant information for each specific purpose: in advertising, the interest rate used for the calculation of the CAT is the average of the product, while for contracts and statements of accounts it should be customized.

customer mobility: banks cannot charge fees for the cancellation of deposit accounts, credit and debit cards, internet banking services and direct debits.

On a related issue, Banco de México established regulation to define in a clearer way some property rights and eliminate some inappropriate practices about fees and commissions in retail banking. Basically, customers must be charged only for services actually received and there cannot be double fees for a single service.⁶²

Other measures have been undertaken to enhance competition by acting on the supply side, in particular by lowering entry barriers. With respect to entry of new competitors, the minimum capital requirements for new banks were reduced and decoupled from the size of the banking system. Two additional measures directed to foster entry are the new figures of specialized banks and of “Comisionistas Bancarios”. Specialized banks, (“*banco de nicho*”) may increase the potential spectrum of competitors in some financial products.⁶³ The figure of *Comisionista Bancario* or Bank Agent, corresponds to a third party allowed to carry out, on behalf of banks, functions of deposit, withdrawal, payments of bills and credits, and to furnish information about account statements and movements. Bank Agents could increase competition in basic financial services by widening their provision at lower costs.

Since 2005, Banco de México has taken several measures to reduce entry barriers in the high value payment system’s network. The Mexican central bank widened the accessibility to the Interbank Electronic Payment System (Sistema de Pagos Electrónicos Interbancarios, SPEI). In particular, regulation was implemented to reduce transactions fees and to open access to the system to non-bank financial institutions. Nonetheless, it is in the low-value payment systems and, in particular, in the systems for credit and debit cards, where problems of discriminatory access persist. On the one hand, there are high discount rates to business and interbank fees that benefit larger banks.⁶⁴ On the other hand, the

⁶² Customers cannot be charged fees: i) for the deposit of a returned check (the cost is already charged by the check issuer); ii) for exceeding or attempting to exceed his debit card balance (the bank is then responsible for preventing this); iii) simultaneously for account management and for holding balances below the minimum; iv) by the two banks involved when cash is withdrawn using an automatic teller machine of a bank different than the issuer of the card.

⁶³ As these intermediaries will receive deposits and have access to the payment systems, they will have to comply with the same regulatory standards than banks.

⁶⁴ A bank owner of the Point-of-Sale Terminals (the acquiring bank) charge discount rates to the business affiliated as a percentage of the receipts signed by card holders in that terminal. The bank that issues the payment card used charges the acquiring bank an interbank fee (*cuota de intercambio*) for each transaction.

existing card switches are owned by banks, creating incentives to impose entry barriers to the use of the network by non-members.⁶⁵ Among the measures undertaken by Banco de México are the publication of the maximum discount rates by financial institution and the participation, with the Association of Mexican Banks (ABM), in the revision of interbank fees to promote a greater use of these means of payment. Currently there is an initiative in Congress aimed to regulate competition practices of card switches.

In an additional measure in the low-value payment system, Banco de México, together with other financial authorities, issued regulations for new types of sight deposit accounts known as “Simplified File Accounts” (Mobile Accounts), to promote access to banking services through cellular phones. The lower cost of mobile transfers, compared with checks and debit and credit card payments, may induce more competition in the retail payment system.

Although over the last two years there has been important progress in reforming the regulatory framework to improve competition of financial services in retail banking, some distortions persist that hamper its efficient functioning, particularly in the case of credit cards. In this context, Comisión Federal de Competencia (2009) presented additional proposals aimed to enhance competition in this market. Among these proposals are: i) to reduce restrictions for customers willing to switch institutions (further improve transparency, establish standardized procedures for transferring accounts and allow the recipient bank to act on behalf of the customer); ii) to guarantee competitive access to infrastructure networks, in particular in the low-value payment systems (forbid vertical integration of banks with credit and debit cards switches and credit bureaus); iii) to encourage competitive interbank fees (make the methodologies and parameters used to establish those fees public); and, iv) to eliminate unnecessary requirements about minimum branch networks. In addition, to deter monopolistic and collusive practices, COFECO proposes to modify sanctions in line with international practices. Higher sanctions established as a significant proportion of total revenues for the offender institution can deter monopolistic practices. For the latter case, the proposal is to prosecute the persons involved in collusion agreements.

Discount rates are determined by each acquiring bank and have as a floor the interbank fee. Interbank fees are mutually agreed upon by banks participating in the card market.

⁶⁵ The card switches are the compensation chambers for the transactions done with credit and debit cards.

Finally, a comprehensive assessment of competition in the Mexican banking system needs some final considerations about the resilience that this system has shown in the current episode of the global financial crisis. Despite restrictive global financial conditions, the adverse economic situation in Mexico and the significant increase in write-offs and loan loss reserves, banks have maintained high capitalization levels, well above those required by regulation, and have continued generating profits (see Figure 19).⁶⁶ Moreover, even when foreign financial institutions own or have a majority stake in a large number of banks established in México, and some of these parent companies have experienced huge losses, the solvency of the banks in México have not been threatened. Among the factors that may have contributed to this resilience are:

- i) Banks in Mexico, like in other emerging economies, had limited exposure to toxic assets. The high margins that the banks enjoy in traditional credit products reduced incentives to search for higher yields in more sophisticated financial products. In addition, in general, global financial groups tend to concentrate local risks in their subsidiaries in other countries. Finally, securitization in Mexico was at early stages and the level of financial sophistication was lower than in more advanced economies.
- ii) The prudential regulation in place contributed greatly to safeguard the banking system. There are regulations to prevent currency mismatches by penalizing short term funding in foreign currency and by limiting uncovered foreign currency positions in the bank balances. With regard to ownership, Mexico has not allowed foreign banks to operate as branches but only as subsidiaries, separating their legal personality from the one of their parent banks.⁶⁷ Mexican legislation places very strict limits on transactions between banks established in Mexico and their parent companies.⁶⁸

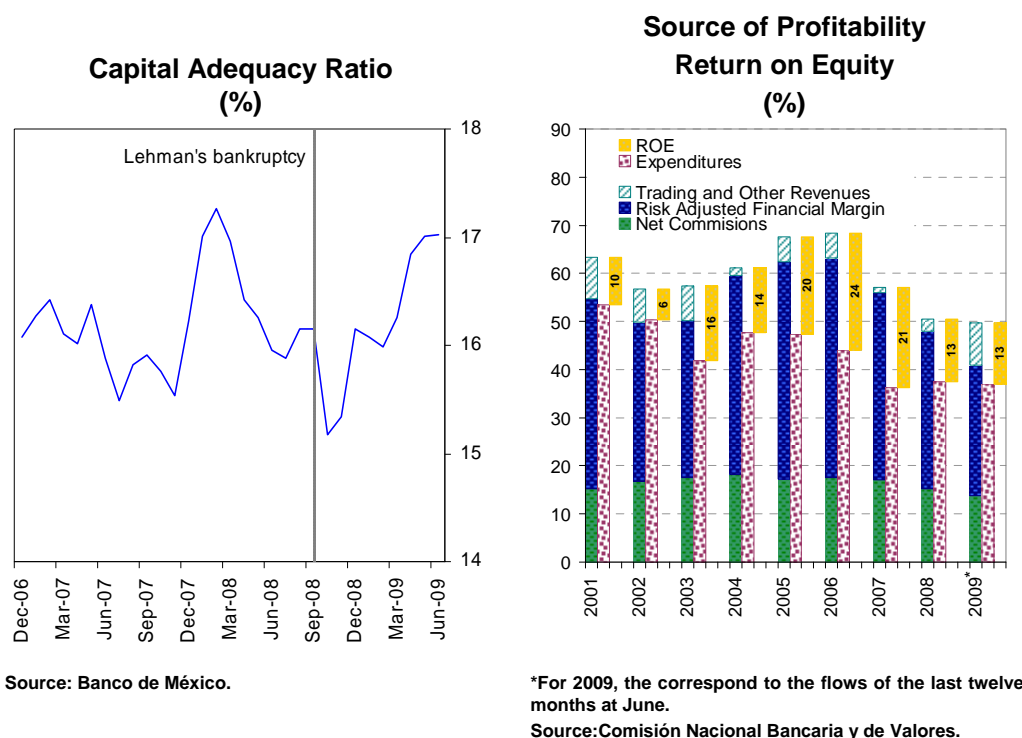
⁶⁶ Since the fourth quarter of 2008, the risk adjusted financial margin revenues have continued decreasing, as a result, among others, of: i) higher write-offs and delinquency rates; ii) a contraction of consumption credit, that has a higher interest rate; and iii) a substitution of credit in favor of larger firms, which pay smaller interest rates premiums.

⁶⁷ This separation is particularly relevant in protecting the subsidiaries creditors and depositors' rights in the event of a bankruptcy.

⁶⁸ The regulation identifies parent companies as a related party and limits related transactions to a maximum of 50 percent of net Tier 1 capital. Related transactions refer to all deposits, loans or credit, including net positions in favor of the institution from derivative transactions, as well as investments in securities other than stock.

- iii) Finally, it is possible that the high margins the banks enjoy had provided them with an extraordinary buffer to absorb shocks.

Figure 19. Banking Sector Capitalization and Profitability



The last factor brings into account the discussion of a possible trade-off between competition and financial stability. The basic idea underlying this trade-off is that profits could provide a buffer against financial fragility and that greater bank competition may reduce margins and give incentives to individual banks to take on more risk.⁶⁹ Although there are no definite answers, neither theoretical nor empirical, about the effect of competition on banking stability, it is difficult to justify on stability grounds the persistence of a non-competitive banking system. In the first place, market power does not guarantee financial stability. Indeed, in a heavily concentrated banking system, “too big to fail” financial institutions may intensify risk-taking incentives and increase fragility. Secondly, although banking crises generate high costs, they are infrequent, while concentration and

⁶⁹ For a review of the literature on competition and financial fragility see Carletti and Hartmann (2003), and Beck (2008).

lack of competition generates a continuous efficiency loss in terms of productivity and growth. Finally, and more importantly, whether bank competition results in financial fragility or not is fundamentally related with the appropriateness of the regulatory and supervisory framework in place.

4.2 Information and Communications Technology (ICT)

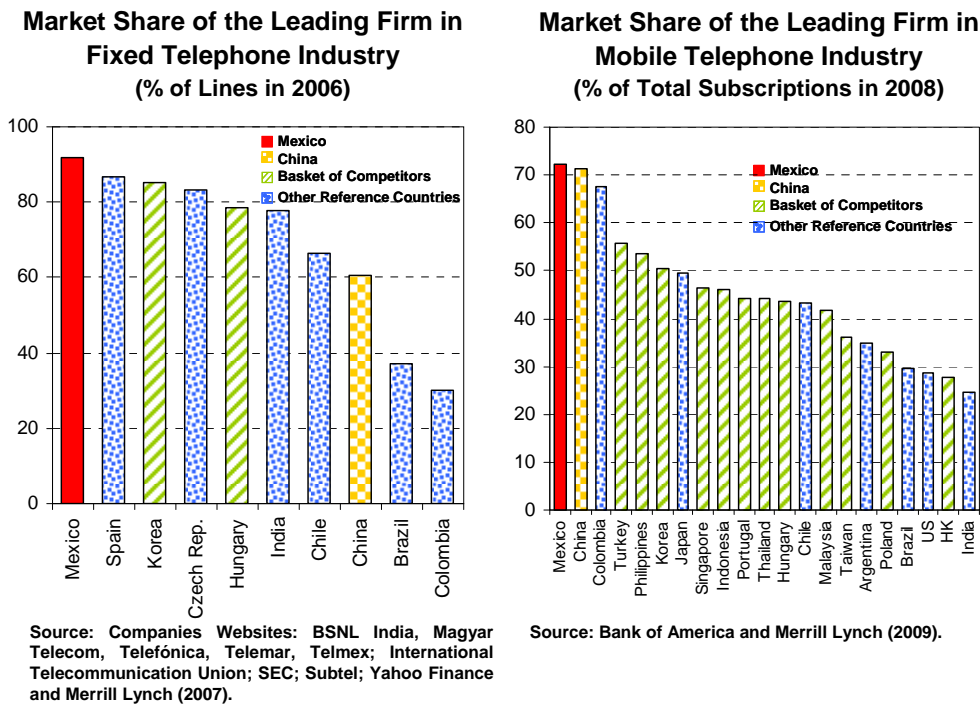
Another relevant market where an apparent lack of competitive conditions seems to be detrimental for the overall productivity of the Mexican economy corresponds to the Information and Communications Technology (ICT) sector. As we will see below, when comparing Mexico with international standards, in this sector we again observe a combination of high concentration of incumbent providers, high prices and low penetration of some relevant services, such as broadband.⁷⁰ According to the World Bank (2006a), the overall non-competitive situation of this sector is apparently related with a weak regulatory framework and, in particular, with the lack of independence and enforceability powers of COFETEL, Mexico's telecommunications sector regulator. Indeed, the current institutional framework does not seem to be dismantling barriers of entry and discrimination in the access to the telecommunications network. This situation is especially worrisome if we consider the relevance that the ICT sector has in the efficient allocation of resources, the alleviation of poverty, the accountability and transparency of government, the diffusion of knowledge and economic growth (see Jorgenson and Vu, 2005; World Bank, 2006b; Jensen, 2007).

Concerning market concentration, Figure 20 illustrates an international comparison of the market share of the dominant firms in the fixed and mobile telephone services.⁷¹ According to these figures, the dominant player in each of these markets in Mexico has a larger market share than the shares observed in other countries. This may be suggestive of high market power and a lack of competition in these markets within Mexico.

⁷⁰ A more detailed analysis of the features of the Mexican ICT sector and of its comparison with other countries than the one made here may be found in Del Villar (2009) and World Bank (2006a) and the references therein.

⁷¹ In the case of Mexico, TELMEX and TELCEL (which belong to the same entrepreneurial group) are the relevant dominant suppliers in these two markets, respectively.

Figure 20. Market share of leading firms in telecommunications markets

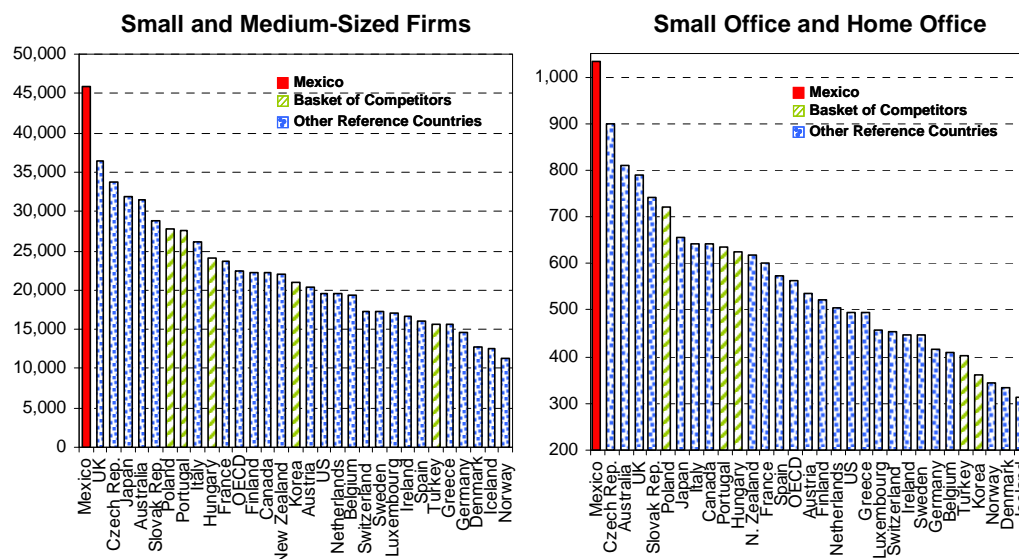


Market power, in turn, may be allowing the incumbent firms to charge relatively high prices.⁷² To illustrate this, Figure 21 exhibits international comparisons of annual total costs of the OECD basket for business fixed-line telephone services.⁷³ As may be noted, Mexico's provision of these services is especially expensive, when compared to most other OECD countries. Similar results are obtained if international comparisons are made for mobile service rates or for other telecommunication services (see OECD, 2007c; Bank of America and Merrill Lynch, 2009). According to World Bank (2006a), these high prices may lead to an especially high profitability of incumbent firms. Indeed, according to this document, TELMEX's profitability margins not only exceed twice the levels recorded by its closest competitors, but are also significantly above those observed in other countries.

⁷² It is important to mention that, internationally, prices of telecommunication services exhibit a significant downward trend, reflecting the fast pace of technological improvements in processing and transmission capacity, as well as in the costs of network equipment and development. Mexico has indeed experienced reductions in the prices of these services in the last years. However, as seen in the main text, price levels still compare unfavorably with those of other countries.

⁷³ The OECD constructs several fixed-line and mobile telephony consumption baskets in order to be able to compare price levels of telecommunications services across OECD countries in terms of a standardized basket of services.

**Figure 21. Annual Cost of OECD's Business Fixed-Line Basket
(U.S. dollars, PPP Adjusted)**



Source: Results from Teligen T-Basket. Copyright Teligen, UK. This telecommunications cost indicators use the OECD basket methodology.

Finally, concerning the low penetration of services in Mexico, as compared to the rest of the world, the case of broadband should be highlighted. As is well known, broadband is the most efficient and less costly platform to carry voice, video and data.⁷⁴ Its penetration has important implications not only for spreading knowledge, but also for the creation of business opportunities and for improving the economy's competitiveness. As a consequence, broadband access is increasingly used as an indicator of the level of development of the ICT sector (World Bank, 2006a).⁷⁵ In this context, Figure 22 compares

⁷⁴ Broadband refers to the transmission of data in which various pieces of information are sent simultaneously in order to increase the effective transmission speed. The term is also used when two or more signals share the same transmission medium. Broadband is traditionally associated with speeds above 128 kilobits per second. Unlike narrowband or dial-up access, broadband allows surfing the web and making telephone calls simultaneously, as well as watching video and carrying out other activities that require a high-speed connection.

⁷⁵ We highlight the case of broadband because of its current relevance within the ICT market. This does not mean that, in other services, Mexico exhibits penetration levels that are comparable to other countries. In fact, Mexico tends to exhibit relatively slow increases in the introduction of telecommunication services and, thus, currently small penetration levels, even in more basic products. For example, according to the World Bank (2006c), Mexico has around 150 telephone mainlines per 1,000 persons. This is half the penetration observed in the East Asian region and a third of the one observed in the European countries described in the first part of this study. This stands out if we note that current mainline penetration in Mexico is 5 times larger than the one observed in the 70's, when Mexico's penetration was similar to that of the Asian countries. Thus, the pace in which the Mexican population has been gaining access to telecommunication services, although high, has been clearly below the one observed in other countries.

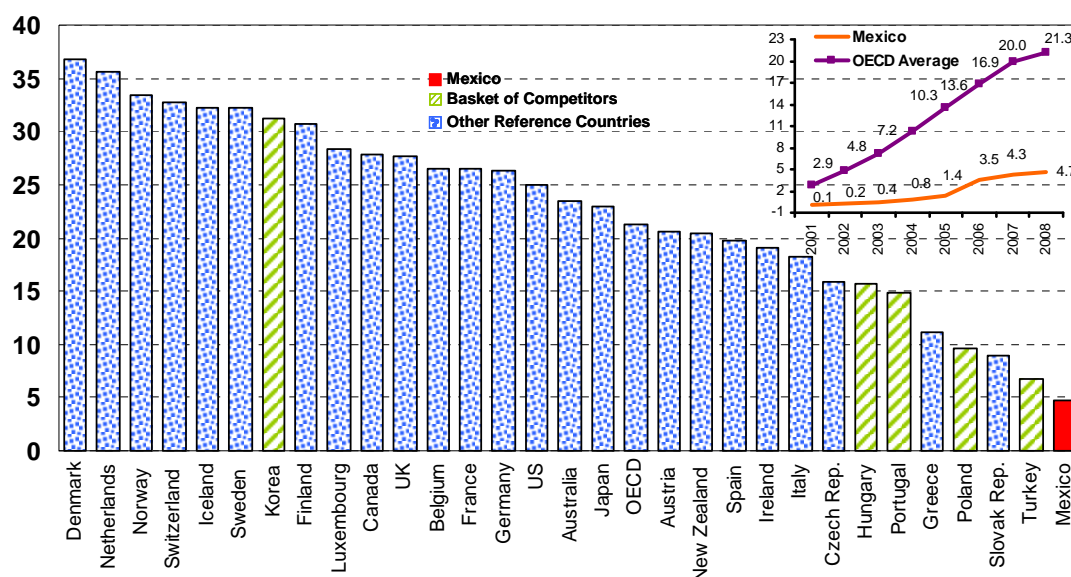
the recent growth and current penetration of broadband in Mexico with the rest of the OECD. Broadband penetration in Mexico, when measured as the number of subscribers per 100 persons, is the lowest among this group of countries.⁷⁶ This may in part reflect the fact that, according to the literature, Mexico has been exhibiting low levels of investment in information technology (even after adjusting for per-capita income levels) and, in particular, has not followed the trend observed in most other countries of the world, in which investment in information technology has increased significantly during the last decade (see the evidence provided by Jorgenson and Vu (2005) and World Bank (2006a and 2006b)).

In turn, as already mentioned, the abovementioned could be reflecting weaknesses of the regulatory framework, which are apparently allowing dominant players in the markets to erect barriers of entry and, thus, avoid a more generalized use of the most advanced technologies. Indeed, recent technological advances allow convergence in the provision of voice, data and video services. This could be a worthwhile opportunity for these services to be provided under more competitive conditions. In order to capitalize these benefits, however, an efficient regulatory framework that avoids dominant firms owning the network to restrict access is needed.

Indeed, the enactment of reforms that promote competition in the telecommunications sector would clearly have positive effects on the competitiveness of the economy. According to the World Bank (2006a), several actions could be implemented in this direction. In particular, an enhancement of the credibility, efficacy, independence and transparency of COFETEL, and regulatory changes that eliminate barriers of entry and guarantee a generalized and non discriminatory access to the network, are fundamental ingredients of an integral strategy to enhance competition in the sector and boost the use of efficient telecommunications services. In this context, it is especially important to avoid that the dominant players in the market form monopolies with the newly available technologies, such as Wireless Fidelity (WiFi), Power Line Communications (PLC), Digital Subscriber Line (DSL) and VoIP, among others.

⁷⁶ According to the OECD (2007c), Mexico not only exhibits a low penetration of broadband services. The speed ranges and price levels of its broadband service also compare unfavorably with most other OECD countries.

Figure 22. Broadband Subscribers
(Number of subscribers per 100 persons in 2008*)



* Data up to the first quarter of 2008.
Source: OECD (2008).

4.3. Electricity⁷⁷

Finally, another sector that seems to be affecting the competitiveness of Mexico's industry is electricity.⁷⁸ As we may note in Figure 23, since year 2000, the prices charged for electrical energy to the industrial sector in Mexico have risen above the prices charged to U.S. industry.⁷⁹ Moreover, electricity price levels for industry in Mexico are not only currently higher than those observed in the U.S., but also compare unfavorably with those charged in many other countries.⁸⁰

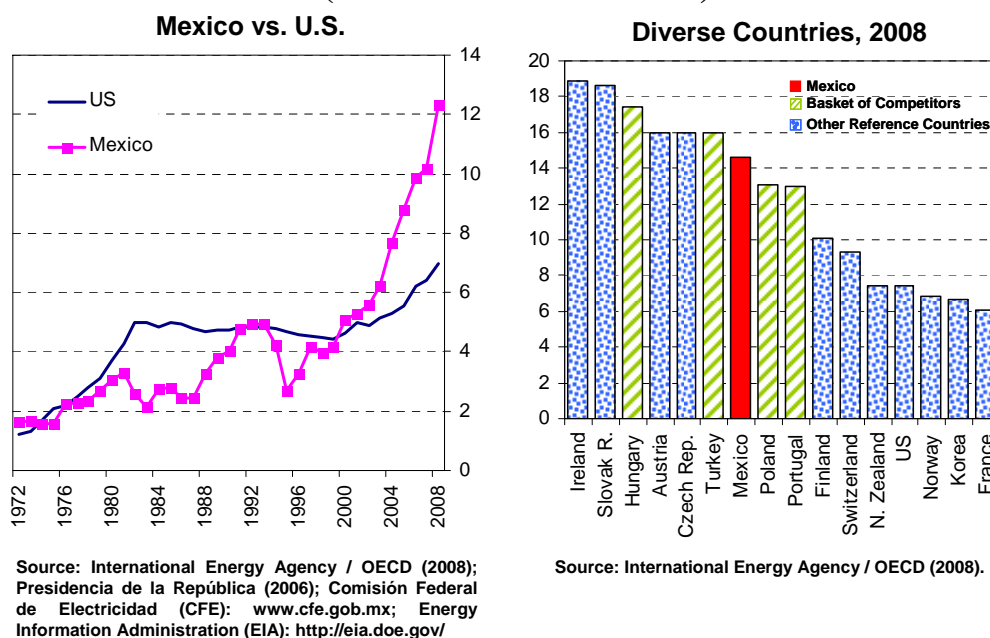
⁷⁷ This section is based on Martínez Chombo (2009).

⁷⁸ Until September 2009, the electricity sector in Mexico was fundamentally composed by two state-owned firms: Comisión Federal de Electricidad (CFE) and Luz y Fuerza del Centro (LyFC). CFE generated most of the electricity and supplied and distributed it across the country, with the exception of the Federal District and some municipalities within the States of Mexico, Hidalgo, Puebla and Morelos, where the distribution was in charge of LyFC. On October 10, 2009, fundamentally as a response to the inefficiencies described in this section, the government shut down LyFC by presidential decree, immediately starting its liquidation process. The electricity distribution of Mexico City's metro area was temporarily handed over to CFE. Up to the date of this writing, the government has not decided if it will permanently merge the operations of LyFC with CFE or incorporate a new state enterprise under a radically different scheme of incentives.

⁷⁹ The price levels in Figure 23 are computed as the ratio of the value of electricity sales to the quantity of energy sold. These figures do not include additional costs, such as those related to the connection to the electrical network, and do not adjust for international differences in the quality of service.

⁸⁰ According to data from CFE and the U.S. Energy Information Administration concerning electricity tariffs in Mexico and U.S. bordering states, the relative difference between prices to commercial customers in Mexico seems to be even higher than in the case of industrial customers (the data supporting this is available

**Figure 23. Mean Electricity Prices, Industrial Sector
(U.S. Dollar cents/ kWh)**



The distinct behavior exhibited recently by electricity prices in Mexico and in the U.S. reflects, in part, the fact that the prevailing technology in each country uses different inputs, which prices have had a different evolution in the past few years. In particular, Mexico's electricity is generated mostly in combined-cycle and steam turbine power plants, based on the use of natural gas and fuel oil, respectively. According to the International Energy Agency, the prices of these inputs have increased substantially since year 2000, as compared with the price of coal, which is the main primary fuel used by U.S. electricity generation technology.

Other factors related with the structure of Mexico's electricity sector, however, also seem to be affecting its price levels and their recent increases, as compared with the U.S. Two such factors stand out: i) the high level and recent increases of labor costs, in a context of low labor productivity levels; and, ii) the gradual increase in energy losses related to

from the authors upon request). In contrast, electricity prices to households in Mexico are among the lowest within the OECD. This reflects the existence of cross-subsidies across different types of customers in Mexico. Given this price structure and the fact that industrial prices in Mexico are above those in other countries, it is possible to argue that both industrial and commercial customers are truly cross-subsidizing households' electricity consumption in Mexico. This evidently affects the competitiveness of Mexico's industrial sector.

illicit uses of energy (non-technical losses).⁸¹ These factors, in turn, tend to be related respectively with the well known bargaining power of the electricity workers' unions and with ambiguities in terms of the public institution in charge of enforcing the law sanctioning illegal uses of electricity.⁸² This, in a context in which, reflecting the growth of the informal sector and the construction of new housing projects, these illegal uses have grown substantially in Mexico City.⁸³

Concerning labor costs, it is important to highlight that, apparently as a result of their collective bargaining power, electricity workers have not only been among the highest paid in the country, but their wages have also tended to exhibit consistently larger yearly increases, as compared to the rest of the economy (see Figure 24). Two additional factors exacerbate this situation:

First, high wages to active employees have not been the only relevant concept affecting labor costs of electricity firms. Additional benefits provided to current employees and to retired workers are also higher than in other sectors of the economy. This was more dramatic for the now extinct LyFC, where the value of benefits to retired workers tended to increase in tandem with the wages and benefits of active employees.

Second, productivity levels in the industry have been extremely low by international standards and, furthermore, have not exhibited trends that match the recent increases exhibited by wages. Indeed, a comparison of the ratios of energy sold or of the number of users of the electricity sector to the number of electricity workers in Mexico with those observed in diverse Latin American electricity firms, such as those in Chile and Brazil, suggests that, if Mexico's firms worked with the same productivity standards as firms in

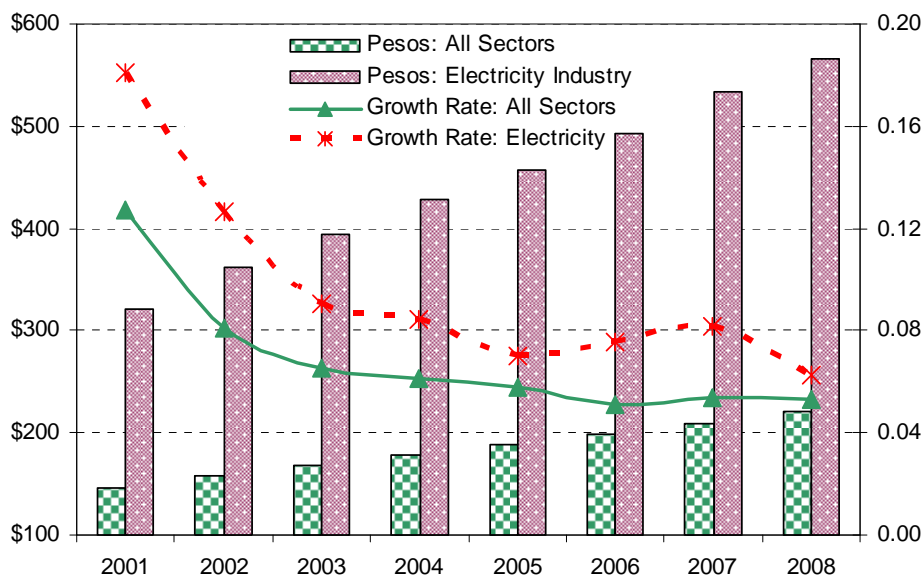
⁸¹ Even when, on average, the prices charged to customers are well above international standards, the electricity industry receives a transfer from the federal government to cover up its high operating costs.

⁸² Given the relatively better performance in terms of labor productivity and non-technical losses of CFE over LyFC, the recent shut down of the latter could ameliorate both of these factors.

⁸³ The law (*Ley de Servicio Público de Energía Eléctrica*) establishes specific sanctions to illicit uses of electricity, which go from fines to the suppression of service, and specifies that the Secretaría de Hacienda and the Secretaría de Energía should be in charge of this enforcement. LyFC, however, would have been a natural enforcer, in terms of its higher capability of identifying informal activities that steal electricity through illegal connections to the public network and new housing projects that do not comply with a legal purchase of electricity. In this context, it is the lack of coordination between the different public institutions what seems to be allowing the recent growth of illegal uses of electricity.

these countries, they would possibly need significantly less employees to attain the same levels of output.⁸⁴

**Figure 24. Mean Daily Wages Registered at IMSS
(Current Pesos)**



Source: Comisión Nacional de Salarios Mínimos, using IMSS information.

Furthermore, as may be observed in Table 4, the productivity of electricity workers in Mexico, when measured with the ratio of energy sold to the number of workers, increased around 5% in 2001-2008. Similarly, if productivity is measured by the number of

⁸⁴ For example, in terms of the distribution segment, if in 2005 LyFC and CFE had worked with the standards of Colombia's firm EMCALI (a state owned company with one of the best labor productivity in Latin America), they would have been able to attain the same energy sales with 44% and 25% less employees, respectively. In an extreme case, if these Mexican firms worked with the productivity standards of CGE (a Chilean private firm with one of the best labor productivity in Latin America), their over-employment levels would seem to be around 67% and 57% respectively. The data for these calculations are based on information collected by World Bank, Benchmarking Database of the Electricity Distribution Sector in the Latin America and Caribbean Region 1995-2005 (<http://info.worldbank.org/etools/lacelectricity/home.htm>). Similarly, in the generation segment, CFE's productivity levels also compare unfavorably with the performance of other Latin American electric companies. For example, when comparing the energy generated and the capacity installed per worker of CFE with the Latin American branches of the Spanish company ENDESA, the productivity of CFE seems to be at least 60% lower than that of ENDESA. The data for these calculations are based on information from CFE, LyFC, ENERSIS (http://www.enersis.cl/enersis_web/action.asp?id=21760) and ENDESA (http://www.endesa.cl/Endesa_Chile/action.asp?id=00010&lang=esand). These calculations are available from the authors upon request. See also Andres, Foster and Guasch (2006) for an analysis of the impact of privatization on the productivity levels of diverse electric utilities in Latin American countries. According to this study, on average, decreases of more than 40% in the number of electricity employees of the analyzed firms were observed in the first five years after privatization.

users of the industry per worker, it only increased by 20%. In contrast, the real wage of electricity workers increased in this period by more than 40%.

Turning to the second topic, energy losses correspond to energy that is produced by electricity firms but is not charged for. While part of these losses are due to technical factors that, to some extent, occur naturally in the transmission of electricity (the so-called technical losses), another part is related to electricity theft derived from the alteration of electricity use measurement devices or from illicit connections to the network (non-technical losses).

**Table 4. Labor Productivity and Real Wages in the Mexican Electricity Industry
(Annual Growth Rate)**

	Energy Sold / Number of Workers	Users / Number of Workers	Real Wage*
2001	-2.19	0.58	11.01
2002	-0.67	1.45	7.24
2003	0.75	4.87	4.29
2004	0.53	2.44	3.59
2005	3.61	3.33	2.92
2006**	1.73	1.71	3.78
2007**	2.11	3.44	4.07
2008**	-0.96	1.04	1.08
00-08	4.89	20.40	44.49

* Real wages correspond to the daily average of the IMSS quotation wage deflated by the CPI.

** Energy Sold and Users from CFE, Number of total workers from CFE and LyFC.

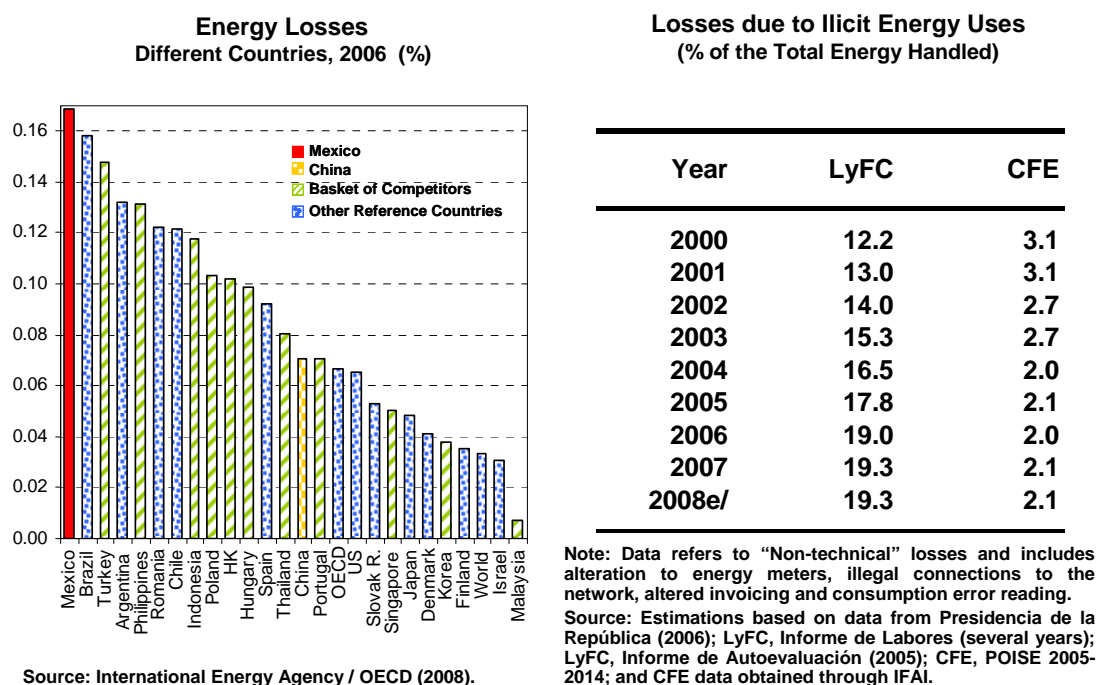
Source: Own elaboration based on Presidencia de la República (2006), Comisión Nacional de Salarios Mínimos, using IMSS data <http://www.conasami.gob.mx>, Comisión Federal de Electricidad <http://www.cfe.gob.mx> and "Segundo Informe de Labores 2007-2008" and Luz y Fuerza del Centro <http://www.lfc.gob.mx/>.

In this context, as may be noted in Figure 25, Mexico's energy losses, as a percentage of total energy handled, compare unfavorably with other countries. Furthermore, as already mentioned before non-technical losses have increased substantially in the last years, especially in the regions that were attended by LyFC, where Mexico City stands out.⁸⁵ These losses have a direct impact on the costs of electricity provision and are

⁸⁵ The methodology used to obtain the figures related to losses due to illicit energy uses is available from the authors upon request.

eventually charged either to electricity consumers, through higher prices, and/or to taxpayers, through larger budgetary transfers to the sector.

Figure 25. Electrical Energy Losses (%)



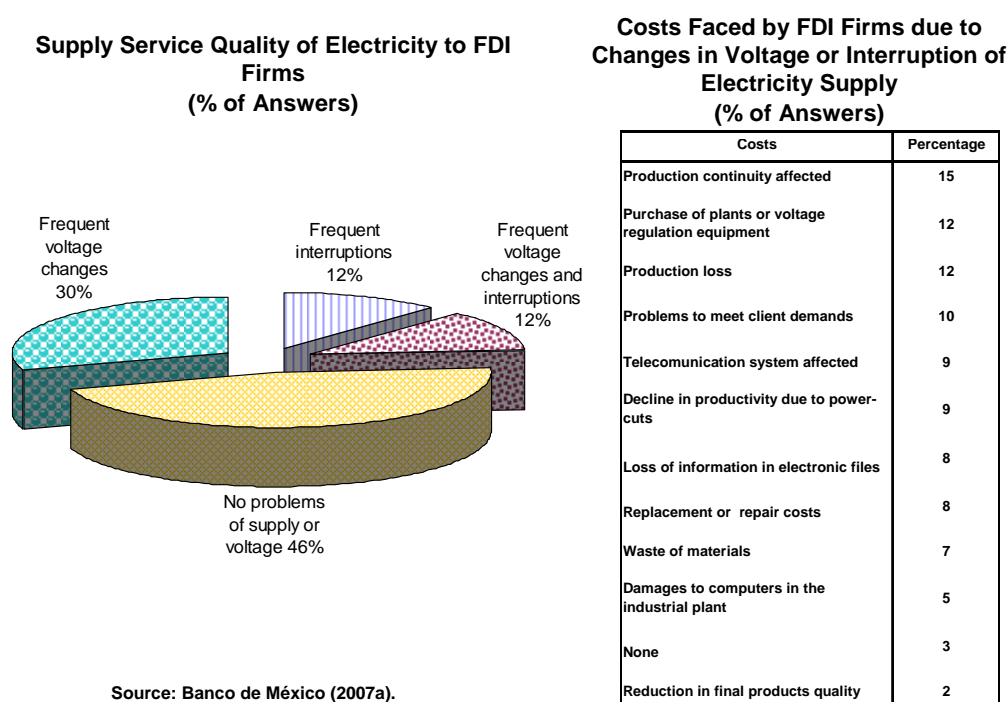
It is finally important to highlight the fact that high prices are not the only factor related to the electricity sector that may be affecting the competitiveness of Mexico’s industrial activities. These are also facing indirect costs related to the overall low quality service that the electrical industry provides. Indeed, 54% of the FDI firms surveyed in 2007 expressed that they frequently suffer abrupt voltage changes or energy interruptions (see Banco de México, 2007a). This implies for these firms the need to incur in diverse additional costs, such as those related to the purchase of electrical plants or energy regulators, the losses of continuity in production processes and of information and the costs of replacement or repair of damaged equipment (see Figure 26).

Given the results above, it is clear that an effort to reduce the cost of electricity and to improve the quality of this industry’s service is urgent.⁸⁶ Although these kinds of

⁸⁶ The recent liquidation of LyFC should be a step in the right direction provided that the replacing entity, CFE or other, operate under an incentive scheme driven by gains in efficiency and productivity.

problems of the electricity sector have been evident since the last decade, the energy reform of November 2008 did not consider the electricity sector. Some of the needed reforms in such sector are to enhance the transparency of CFE, emphasize the accounting separation between segments and business areas to strengthen their accountability (at least to its functional parts -generation, transmission, distribution and commercialization-, and the new telecommunication business area) and to adopt better corporate governance practices. Transparency policies, as well as the establishment of rules that allow a clearer link between wages and productivity, should be applied to the electricity workers' union.⁸⁷

Figure 26. Electricity Service Quality



The energy sector is an example where, given recent technological advances, regulatory changes could be made in order to achieve a more efficient use of the public

⁸⁷ A policy focused on reducing the costs and increasing productivity of the electricity industry would necessarily go through the challenges of: i) reducing energy losses; ii) reconsidering the organizational structure of the sector (e.g. analyzing the convenience of separating the control of the grid and the dispatch); iii) making efforts to attain a more diversified generation segment, in order to mitigate the effects of fluctuations in the prices of fuels used as inputs; and, iv) reducing the discretion of the electric utilities to grant access to the power grid, in order to boost the participation of private users. A revision of the tariff policy, in order to adjust it to efficiency criteria, seems also to be needed.

infrastructure and, at the same time, to enhance competition in other sectors, such as in the case of telecommunications. For example, the communication infrastructure of CFE could be used to provide telecommunications services and enhance competition in the telecommunications market, eventually leading to improved access conditions to the broadband infrastructure, a larger penetration of services and lower prices to users. Some efforts in that direction have been done in the last years. In particular, in November 2006, CFE received the concession to provide telecommunication services as a way to exploit its fiber optic infrastructure, the second largest “backbone” telecommunication infrastructure in the country. In May 2009, the government announced its intention to auction part of its dark fiber network to third parties on those routes where CFE has spare capacity. This will allow the entrance of new competitors, beside CFE and the dominant company TELMEX, in the interstate telecommunication business.⁸⁸ It remains to be seen if the amount of dark fiber auctioned is enough to develop a robust effective competition in the sector. Another similar example is PEMEX’s cogeneration capacity in its petrochemical and refining processes, which could be exploited to generate electricity at lower prices to customers, by allowing the most inefficient electric power capacity to be phased out.⁸⁹ At the same time, CFE could be allowed to explore new sources of natural gas, instead of importing it at possibly higher costs.⁹⁰

5 Current challenges

The evidence described in this paper suggests that Mexico’s poor long-run growth performance is fundamentally linked with an institutional framework that induces unproductive rent-seeking behavior by different groups of economic agents, in a context of non-competitive and rigid market structures, instead of promoting investment, the use of

⁸⁸ The CFE received the concession, for a period of 15 years, to provide telecommunications services through selling capacity (illuminated fiber). However, the benefits of leasing part of the CFE’s excess fiber optic cable space (dark fiber), in terms of enhancing competition in interurban communication (backbone network), would clearly be larger than those that could be reaped under the current conditions. The dark fiber leasing is a common practice in several countries. See for example the Edison Carrier Solutions in the U.S. (<http://www.edisonconnect.com/wireline/darkfiber.asp>) and the Toronto Hydro Telecom in Canada (http://www.hydroonetelecom.com/business_solutions/dark_fiber.html).

⁸⁹ Complementary actions, such as allowing PEMEX to sell its energy to CFE through market mechanisms and the application of efficient interconnection rules to access the power grid, need to be taken in order to reap out the largest benefits from cogeneration.

⁹⁰ In a context of budgetary constraints, PEMEX’s incentives have been to only exploit crude oil projects, which are currently more profitable than those of natural gas extraction.

modern technologies and an efficient allocation of resources. In this context, in order to boost economic growth, Mexico needs a deep change in the structure of incentives of its economy. This, in order to: i) induce increases in the accumulation of capital (both physical and human); ii) improve the efficiency in the allocation of resources; and, iii) enhance productivity. To attain these objectives, in turn, Mexico seems to require specific actions in two interrelated fronts:

- Institutional change. Deep reforms to the institutional framework to encourage competition in both input and product markets and, in particular, to eliminate barriers of entry into economic activities and to empower consumers, are needed. Also, reforms that enhance flexibility in the allocation of resources, such as labor, seem to be especially relevant to boost competitiveness. The design of a regulatory framework that supports technology upgrading and discourages unproductive rent-seeking behavior is also needed. Clearly, for all these policies to have the desired effect, we also need the agents that regulate economic activity to have the appropriate incentives too.
- Public policies. The role of the government to foster growth and development through the application of public policies in specific areas should also be enhanced. This is especially the case in activities where social returns may surpass private returns, such as the creation of basic infrastructure, the formation of human capital (schooling, health, social security and abatement of poverty) and R&D. Some of these activities may fundamentally require explicit promotion through public expenditure programs, while others, such as R&D and the adoption of the latest technologies, may also require the application of specific incentive mechanisms for their implementation on the part of the private sector.⁹¹ It is clear that, in order to attain adequate results in this front, public resources should be allocated efficiently,

⁹¹ Concerning this last topic, we only need to take a look at countries where stronger links between the academic and industrial sectors have promoted a faster technological progress. In contrast, the lack of links between the productive sector and universities in Mexico seems to be limiting its growth potential (see Lederman, Maloney and Servén, 2005; Maloney and Perry, 2005). To boost technological progress, a reinforcement of the institutions that protect intellectual property rights may also be helpful (see World Bank, 2006a).

which in some instances may require a re-design of the incentives faced by policymakers in charge of the allocation of public expenditure at all levels of government.⁹²

Note that, within these fronts, the recurring areas where actions appear to be required are the same as those mentioned from the start of this analysis: institutions that promote an efficient allocation of resources, market flexibility and competition. In this context, many challenges remain. Among others, the most relevant points that we should emphasize are the following:

Institutions supporting transparency and efficiency in public spending. In terms of reforms directed towards improving transparency and access to information, the approval of the *Ley Federal de Transparencia y Acceso a la Información Pública* (Federal Law of Public Information Access) in 2002 is intended to guarantee the access to government public information, the protection of personal information at the disposal of the federal government and the solution of any refusal to access information gathered by government entities. The enactment of this law is expected to induce more accountability of authorities and, thus, could lead to improvements in the efficiency of the allocation of public resources (see Islam, 2004; Angeletos and Pavan, 2004). It is relevant to emphasize that, in July 2007, a constitutional reform that extends the transparency implications of the law approved in 2002 to state governments and municipalities was enacted. However, this does not necessarily guarantee that accountability related to government spending at local levels will be immediately achieved. Amongst others, a high degree of heterogeneity in the classification and accounting practices of local governments persists. Furthermore, a larger amount of resources than those currently being assigned to the hiring and training of personnel in charge of evaluation and control of local spending seems to be needed. Finally,

⁹² To give an example of the impact that the allocation of public resources may have on output, consider the case of public schooling. Manuelli and Seshadri (2007) show that, in a context characterized by ability heterogeneity and credit constraints, distortions in the allocation of the resources of the public education system across individuals and schooling levels (e.g. primary, secondary and tertiary), seem to be partly responsible of Latin America's poor economic performance in the last decades. In particular, their results suggest that the Latin American countries they study might have been overinvesting in higher education.

the local institutions in charge of enforcing transparency are not fully autonomous from local governments.

The extension of transparency and accountability criteria to all government levels should also be complemented with deep changes in the incentives faced by policymakers in charge of the allocation of public spending. This, in order to guarantee that these expenditures are not assigned to unproductive uses and, instead, become more efficiently allocated towards public policies in concepts with high social returns that may have been unattended in the past. Among others, concepts that seem to be especially relevant are: i) improvements in the coverage and quality of the education system; and ii) increasing the availability of basic transportation, communications and energy infrastructure in some regions of the country that have been relatively isolated from trade and investment flows.⁹³

In this context, the incentive system governing fiscal policy should not only focus on mechanisms to increase tax revenues so as to guarantee sufficient funding for public programs with stable sources, but should also give priority to the efficient allocation of resources on the spending side. In relation to this point, the fiscal reform approved by Congress in September 2007 was fundamentally directed to improve the revenue side of the public finances.⁹⁴ The reform also recognized the need to improve the allocation and efficiency of public spending and, in particular, the priority of enhancing the effectiveness of public policies related to education, health, poverty alleviation and the reduction of regional disparities in terms of basic infrastructure. Furthermore, the need to make the government accountable for the results of public spending programs was also recognized

⁹³ According to the evidence, the southern states of the country, where there are relatively higher poverty levels, may have grown less than the northern region after Mexico opened up to trade, not only because their remoteness from the U.S. market, but also because of a lack of human capital and an appropriate communications and transportation infrastructure to take advantage of the new sources of growth derived from trade liberalization (see Chiquiar, 2005). In this context, according to Dávila, Kessel and Levy (2004), the construction of railroads and paved roads connecting the southern region to nearby ports and to the main transportation networks would seem to allow it to reap larger benefits from globalization.

⁹⁴ The reform eliminates some special regimes, targets fiscal evasion and widens the fiscal base onto sectors that were traditionally exempted. This relies on: i) the introduction of a new flat-rate tax on a measure of value added, that would be paid only when its burden is larger than the current corporate income tax to firms (thus acting in fact as a means of control to the latter tax); and, ii) a new tax of 2% on cash deposits in excess of 25 thousand pesos a month made in financial institutions (this tax may only be credited against other taxes if the taxpayer has an activity registered in the Federal Registry of Contributors, RFC). While the first of the abovementioned taxes is directed to prevent fiscal evasion and to *de facto* eliminate some special regimes that characterized the previous regime, the second is directed to increase the burden on entities that typically evade taxes by operating in the informal sector of the economy. The reform also included a new scheme to distribute federal resources to state and municipalities. Under this scheme, the formulas for the distribution of resources are oriented to reward economic growth and tax collection efforts of sub-national governments.

explicitly. In this sense, the approved reform suggests mechanisms for a results-oriented evaluation of public policies and to subject budgetary allocations to measurable results derived from these evaluations. Although the explicit recognition of these issues goes in the right direction, it remains to be seen if the mechanisms proposed are sufficient to guarantee that these reforms will achieve the intended improvements in the allocation and use of resources towards activities with higher social returns or not. For example, among other issues, a necessary condition for this scheme to work as intended is an appropriate system of incentives for the evaluators of public policies.⁹⁵

A related point that could be emphasized here is that transparency and accountability criteria should be especially relevant in the operation of state-owned enterprises. In this context, the energy reform approved in November 2008 established mechanisms for a greater transparency and a better accountability of the state-owned oil company, PEMEX, through a new structure of corporate governance.⁹⁶ Although the main objective of the reform, which focuses only on the oil sector, is to increase the operational capacity of PEMEX to explore and exploit new fields, the creation of new surveillance bodies, inside and outside PEMEX, is expected to contribute to improve the allocations and use of resources in the sector.⁹⁷ The impact of the reform on transparency and accountability, as well as its success on providing a more flexible framework for the

⁹⁵ A second fiscal reform is currently being discussed to further improve the revenue side of the public finances. The federal government has faced considerable difficulties to gather support for different versions of the reform precisely reflecting, to a large extent, public discomfort about the low efficiency and accountability on the allocation of public resources.

⁹⁶ Among the most significant modifications of the reform in this area are: i) a new conformation of the executive board, with four additional external members besides the eleven members who previously conformed it; ii) creation of a transparency and audit committee constituted by members of the executive board, in change of the evaluation of the financial and operative performance of the company; iii) designation of a Commissioner, who will report about the veracity, sufficiency and rationality of the information issued by the company; and iv) creation of a Oil Committee, constituted by independent specialized technicians who will contribute to evaluate and plan PEMEX exploration and exploitation activities; see Congreso General de los Estados Unidos Mexicanos (2008a y 2008b).

⁹⁷ An important aspect of the reform is that it sets the conditions under which PEMEX can contract services from private firms. Although it does not allow “risk contracts”, the reform gives legal certainty to contracts with the private sector. A change in the tax regime of the company is also included, according to the field’s performance. The goal is to provide greater financial and operational flexibility to PEMEX in order to overcome the accumulated lags in investment. The reform also gives new attributions to the Energy Regulatory Commission (Comisión Reguladora de Energía –CRE) to regulate first-hand sales of gas, fuel oil and basic petrochemicals, as well as to regulate their transportation and distribution (see Congreso General de los Estados Unidos Mexicanos, 2008c). This last measure was adopted as a way to diminish the risks of price distortions and distortions in transport and distribution.

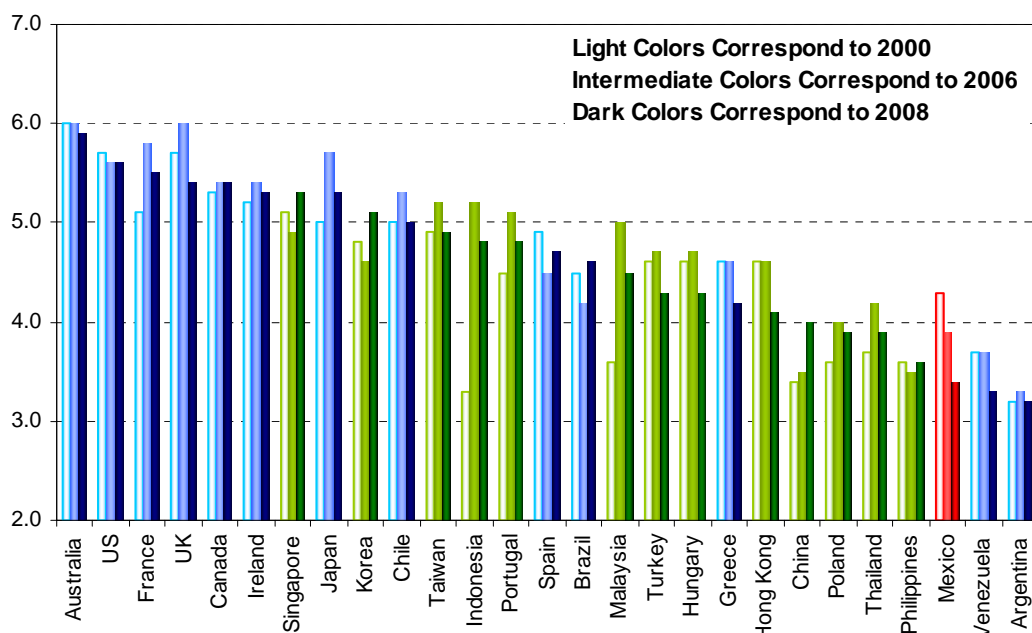
company's operations, will depend on the possibilities of the new legal framework and governance structure of the company to change the system of incentives in the sector.

Competition. In relation to antitrust policy, the Federal Law on Economic Competition (*Ley Federal de Competencia Económica*) was reformed in 2006 so as to grant enhanced authority to the COFECO. In particular, the reform enhanced the definition of monopolistic practices that the antitrust agency may prosecute, it established the possibility of making immunity agreements with those who cooperate in the investigations of the commission and it improved the capabilities of the commission to gather information. Furthermore, as a result of this reform, the COFECO is now allowed to combat interstate barriers to trade, and the federal government is now forced to consider the opinions issued by this institution.⁹⁸ In this context, COFECO has been recently publishing a set of policy guidelines to promote competition in diverse sectors. Among others, recommendations to foster telecommunications convergence, to diminish entry barriers in liquefied petroleum (LP) gas distribution and, as already described before, to improve transparency in retail banking, have been published.

In order to enact these recommendations, however, legal reforms or amendments to regulation, which are beyond COFECO's powers, are needed (Perez Motta, 2007). In particular, key areas remain within the field of competition where additional progress needs to be made. Indeed, despite the abovementioned reform, according to the World Economic Forum the effectiveness of competition policy in Mexico continued decreasing significantly from 2006 to 2008 (Mia and Lozoya, 2008, see Figure 27). In this regard, it is essential to give COFECO more and better legal instruments to enable it to carry out its activities in a more autonomous, expeditious, and decisive way, and to make its assessments have a stronger effect on the markets. Among others, it is essential to take action in the following areas:

⁹⁸ Before this reform, COFECO could not prosecute several anti-competitive practices, such as actions intended to raise competitor's costs, systematic sales below average variable costs, the granting of discounts in return of exclusivity, the persistent use of profits in one market to finance losses in another, in order to displace competitors, and arbitrary price discrimination. Furthermore, the Commission lacked the ability to make its resolutions be enforced by the courts. Many of these omissions were corrected with the reform. For example, price depreciation, arbitrary price discrimination, cross subsidies, hindering productive processes and raising competitors' costs, are now formally typified as monopolistic practices by the law.

**Figure 27. Effectiveness of Anti-Monopoly Policy
(Higher values mean more effective policies)**



The Anti-Monopoly Policy Effectiveness Index goes from 1 to 7 and measures the effectiveness of the Anti-Monopoly Policy of a country: 1= the anti-monopoly policy is relaxed and does not promote competitiveness effectively and 7= the anti-monopoly policy is effective and promotes competitiveness.

Red bars represent Mexico, green bars represent countries of the basket of competitors and blue bars represent other countries of reference.

Source: WEF (2000, 2006, 2008).

- a) Budgetary autonomy. While COFECO is an autonomous entity in terms of its operation, is still relies on the federal government for budgetary purposes. Countries with success stories in the implementation of competition laws have fully independent antitrust agencies that report directly to Congress.
- b) Protection and Judicial System. *Amparos* (legal stays of action) have hindered the implementation of antitrust procedures.⁹⁹ These have been used extensively by the companies sanctioned by COFECO as a tool for delaying penalties and, in most cases, to evade resolutions. In this context, the current judicial system is considered by several studies as an obstacle to the promotion of competition (Avalos, 2006; OECD, 2006; Elizondo, 2009).

⁹⁹ The *amparo* is a mechanism through which private parties may defer the effects of an act of authority by a regulator until the merits of the case are thrashed out in the courts (Levy and Walton, 2009).

- c) Penalties. When compared with other countries, Mexico is still far behind in this vital area.¹⁰⁰ In this context, an increase in the fines applied by COFECO should be made, in order for them to have the sanctioning and dissuasive effect expected from an economic penalty. In particular, it is necessary to establish fines as a function of the firm's assets and revenues, as opposed to fines based on a certain amount of minimum wages, which produce fines that are insignificant compared with the benefits agents derive from monopolistic practices. In this regard, COFECO has already proposed a set of more effective penalties.¹⁰¹ Also, as in the case of some other countries, the imprisonment of firm executives found guilty of deliberately orchestrating anti-competitive practices should be considered as a feasible mechanism that could be used to deter these practices effectively.

Flexibility of the labor market. Concerning actions directed to enhance flexibility in this market, the reform to the state employees' social security system (ISSSTE) approved in March 2007 is a step in the right direction. By switching the pension system of these workers from a pay-as-you-go scheme with defined benefits, to a fully-funded system based on defined contributions, this reform tends to promote larger flexibility in the labor market: under the previous system, the state worker lost the contributions he or she made if he or she switched to a job under a different pension system. In contrast, the worker's contributions are now deposited in an individual account and, therefore, are not lost if the worker moves to another sector.

There are, however, many other issues that need to be tackled in order to enhance flexibility in this market further and, thus, to promote an efficient allocation of resources. In particular, apart from the aforementioned reform to the state employees' social security system, no significant reforms to the labor market have been made. In this context, it is

¹⁰⁰ For example, the maximum fine for absolute monopolistic practices in Mexico amounts to little more than 75 million pesos, while in other countries fines for this kind of practices are imposed for up to nearly 7 billion pesos (91 times more than in Mexico). In the case of relative monopolistic practices, the maximum penalty possible in Mexico is about 46 million pesos, while other countries have come to punish such practices with fines up to the equivalent of nearly 6.7 billion pesos (an amount approximately 147 times greater).

¹⁰¹ In particular, an amendment is proposed to Article 35 of the Federal Economic Competition Law as follows: i) absolute monopolistic practices should be fined for up to 15% of the value of assets or total annual income; ii) for relative monopolistic practices, or concentration practices, a 9% of assets or total annual income fine should be applied; and, iii) in cases of backsliding, 20% of assets or total annual revenues.

clear from the evidence presented in the previous sections that there is large room for improvement in terms of enhancing labor market flexibility by reforming the current regulations related to the creation and termination of contracts.¹⁰² Limiting the bargaining power of unions, especially in non-tradable sectors where a lack of competition in the product markets interacts with the bargaining power of these to generate rent-sharing schemes at the expense of price, service quality, and sometimes, public finances, would also be fruitful. Related to this last point, Blanchard and Giavazzi (2003) developed a theoretical model of an economy with these features. They show that, while the size of rents is determined by the degree of competition in the product markets, their distribution depends on the bargaining strength of workers. In this context, they suggest that the appropriate sequencing of reform implies first reforming the goods markets. In particular, by enhancing competition in the product markets, the size of rents diminishes, thus reducing the incentives of workers to fight for a larger share of these rents. This, along with the fact that enhanced competition in the goods markets reduces goods' prices and, thus, increases real wages, facilitates support for labor market reform.¹⁰³

Furthermore, the current incentives that workers and firms face may not be the most appropriate ones to promote the allocation of workers towards their most productive uses. For example, as mentioned before, the regulations that limit flexibility in the formal sector of the economy (especially those related with the creation of alternative labor contracts and with dismissal costs) not only reduce flexibility and raise the relative cost of labor, as perceived by firms in the formal sector, but may also increase the bargaining power of “insiders” in this sector, leading to a non-competitive equilibrium in the labor market. Also, according to Levy (2007), the relatively recent introduction of social programs directed to

¹⁰² In particular, the feasibility of replacing current dismissal costs with a system of unemployment insurance or a separation fund should be assessed. This could increase market flexibility, by reducing the costs of labor mobility. In this context, using the existing infrastructure of the savings for retirement system could facilitate the implementation of an employment insurance system. A similar reform was implemented successfully in Chile in 2002. In this regard, Acevedo, Eskenazi and Pagés (2006) argue that the main advantages of the new Chilean system would be that: i) it reduces companies' labor costs; and, ii) it reduces the problem of moral hazard induced by traditional unemployment insurance schemes. The authors also argue that this system could be implemented in other emerging countries that have a relatively developed financial sector, such as Mexico.

¹⁰³ In particular, product market deregulation leads to lower rents in general and, possibly, to lower rents going to workers. Furthermore, in the short run, workers' wages may decrease from labor market deregulation. However, if labor market reform is preceded by goods market reform (in particular, by a reduction of entry costs), then workers will gain in the long run as consumers through an increase in their real wages.

use fiscal resources in order to provide social protection to informal workers could be having as side effects some undesirable consequences in the labor market. In particular, these policies could be increasing the relative benefits to the worker of becoming employed in the informal sector of the economy where, as discussed previously, labor productivity seems to be lower than in the formal sector.¹⁰⁴

In this context, an assessment of whether all the benefits associated with mandatory social security are truly valued by employees in a manner consistent with the cost involved is needed. Additionally, it may be desirable to decouple public health services from the labor market. A gradual move from a public health system financed by contributions from wages to a funded system with stable sources of income (i.e., income or consumption taxes) could be implemented. This move would avoid conditioning access to public health to the status of the worker (i.e., formal or informal), could reduce incentives for informal employment, and would maintain a policy of universal health care without inducing additional distortions in the labor market.

6 Final remarks

In the last decade, Mexico made considerable progress in terms of macroeconomic stabilization. This, however, was not enough to reactivate growth during this period. The discussion in this paper highlights the need to move on to a second phase in the reform process, in which Mexico should focus on modifying the structure of its economy and, in particular, its system of incentives. Even when some achievements have recently been made in this front, the examples described in this paper suggest that there is a lot that still needs to be done. Furthermore, while we must acknowledge that the positive effects of some of the reforms that have been enacted are still to be seen, it is also important to recognize that, in many sectors, the reforms so far have not modified the current incentive structure, which still encourages unproductive rent-seeking behavior in a context of rigid, non competitive market structures. In this context, deep reforms are needed, so that the

¹⁰⁴ The *Seguro Popular*, which was introduced in 2002 with a partial regional coverage and was extended to have nationwide coverage by 2005, is a new social security system aimed to entitle informal workers with the same kind of health and life insurance benefits that formal employees receive. One significant difference, however, is that contributions to the formal social security system (IMSS) are paid in parts by the employee, the employer and the government, while in the *Seguro Popular* scheme, a large part of the cost is borne by the government.

current incentive system gives way to a new structure of incentives that foster investment, productivity and an efficient allocation of resources. Given the lack of success in some past reforms, we should now start asking ourselves if the changes in the structure of incentives of the economy should go so deep as to modify those incentives currently faced by the persons and institutions that are supposed to carry on the reform process themselves.

We must acknowledge that this is not an easy task. The atmosphere of “reform fatigue” in the population, the resistance of the groups that may be affected by reforms and, especially, the difficulty to carry out a comprehensive reform path in an environment of extremely unequal distribution of endowments and income, which may sustain a stable equilibrium of reform paralysis (see Rajan, 2009; Levy and Walton, 2009), are important challenges that need to be sorted out. The complexity of determining the proper sequence of reforms and the technical complications to implement them add further difficulties to the process. These challenges, however, are no excuse for inaction. Many countries have been able to go through the reform process successfully and, as a consequence, have boosted their growth rates in a sustained manner, at the same time that they have been able to improve the wellbeing of important segments of their populations.

Given the current international environment, in which the possible long-lasting consequences of the financial crisis of 2008 on U.S. consumption patterns may lead to a reduction of the dynamism of the external demand that Mexico faces, the need of deepening the reform process in this country has become even more urgent. In this context, undertaking the needed reforms to boost its potential growth, reduce its unequal income distribution and, especially, lower its relatively high poverty rates, should be at the top of Mexico’s policy agenda.

References

- Acemoglu, Daron, Pol Antras and Elhanan Helpman (2007). Contracts and Technology Adoption. *American Economic Review* 97 (3): 916-943.
- Acevedo, G., Eskenazi, P. and Pagés, C. (2006). "Unemployment Insurance in Chile: A New Model of Income Support for Unemployed Workers". World Bank Social Protection Discussion Paper No. 0612. October.
- Aghion, Phillipe, Nicholas Bloom, Richard Blundell, Rachel Griffith, and Peter Howitt (2005). Competition and Innovation: An Inverted U Relationship. *The Quarterly Journal of Economics* 120 (2), pp. 701-728.
- Aghion, Philippe and Rachel Griffith. (2005). *Competition and Growth: Reconciling Theory and Evidence*. MIT Press.
- Aghion, Philippe, Peter Howitt, and David Mayer-Foulkes (2005). The Effect of Financial Development on Convergence: Theory and Evidence. *Quarterly Journal of Economics* 120, no. 1:173-222.
- Alcaraz, Carlo, Daniel Chiquiar and Manuel Ramos Francia (2008). *Diferenciales Salariales Intersectoriales y el Cambio en la Composición del Empleo de la Economía Mexicana*. Banco de México Working Paper 2008-XX.
- Amoroso, Nicolás, Daniel Chiquiar and Manuel Ramos Francia (2009). *Technology and Endowments as Determinants of Mexico's Comparative Advantages*. Banco de México, Unpublished Manuscript.
- Andres, Luis, Vivien Foster and J. Luis Guasch (2006). The Impact of Privatization on the Performance of the Infrastructure Sector: The Case of Electricity Distribution in Latin American Countries. World Bank Policy Research Working Paper No. 3936, World Bank, U.S.A.
- Angeletos, George-Marios and Alessandro Pavan (2004). Transparency of Information and Coordination in Economies with Investment Complementarities. *American Economic Review* 94 (1), pp. 91-98.
- A.T. Kearney (2005). *FDI Confidence Index*. Global Business Policy Council, 2005, Volume 8.
- A.T. Kearney (2007). *Estudio de prospectiva tecnológica de la industria automotriz en México*. Presentación final del proyecto. AT Kearney, Inc.
- A.T. Kearney (2008). *Reigniting Mexico's Automotive Industry*. New opportunities could trigger an era of growth. AT Kearney, Inc.

Ávalos, Marcos (2006). Condiciones Generales de Competencia: El Caso de México. Serie Estudios y Perspectivas No. 48, CEPAL, Mexico.

Avalos, Marcos and Fausto Hernández Trillo (2006). Competencia Bancaria en México. Serie estudios y perspectivas. CEPAL, México D.F.

Balassa, Bela (1965). Trade Liberalisation and Revealed Comparative Advantage. The Manchester School of Economics and Social Science, no. 33, 99-123.

Balassa, Bela (1979). The Changing Pattern of Comparative Advantage in Manufactured Goods. The Review of Economics and Statistics, vol. 61, no. 2, 259-266.

Banco de México (2007a). Informe Sobre la Inflación Abril-Junio 2007. Banco de México, Mexico.

Banco de México (2007b). Reporte Sobre el Sistema Financiero 2006. Banco de México, Mexico.

Banco de México (2008). Reporte Sobre el Sistema Financiero 2007. Banco de México, Mexico.

Banco de México (2009a). Reporte Sobre el Sistema Financiero. Banco de México, Mexico.

Banco de México (2009b). Informe Sobre la Inflación Julio-Septiembre 2009. Banco de México, Mexico.

Bank of America and Merrill Lynch (2009). Global Wireless Matrix. First Quarter 2009.

Barro, Robert and Jong-Wha Lee (2000). International Data on Educational Attainment: Updates and Implications. CID Working Paper No. 42.

Baumol, William J., John C. Panzar, and Robert D. Willig. (1982). Contestable Markets and the Theory of Industry Structure. San Diego, CA: Harcourt Brace Jovanovich.

Beck, Thorsten (2008). Bank Competition and Financial Stability: Friends or Foes? World Bank Policy Research Working Paper No. 4656.

Beck, Thorsten, Asli Demirgüç-Kunt and Ross Levine (2000). A New Database on Financial Development and Structure. World Bank Economic Review 14, pp. 597-605. The World Bank Development Research Group.

Bergoeing, Raphael, Patrick Kehoe, Timothy Kehoe and Raimundo Soto (2002). A Decade Lost and Found: Mexico and Chile in the 1980s. Review of Economic Dynamics 5: 166-205.

Bharat Sanchar Nigam Ltd. (BSNL India) (n.d.). Retrieved February 6, 2008, from

<http://www.bsnl.co.in/network/telephone.htm>

Blanchard, Olivier J. and Francesco Giavazzi (2003). "Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets". *The Quarterly Journal of Economics*, Vol. 118, No. 3, pp. 879-907.

Blanchard, Olivier J. and Danny Quah (1989). The Dynamic Effects of Aggregate Demand and Supply Disturbances. *The American Economic Review* 79 (4), pp. 655-673.

Blundell, Richard and Stephen Bond. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87:115-143.

Boldrin, Michele and David Levine (2008). Perfectly Competitive Innovation. *Journal of Monetary Economics* 55, pp. 435-453.

Botero, Juan, Simeon Djankov, Rafael La Porta and Florencio C. Lopez-De-Silanes (2004). The Regulation of Labor. *The Quarterly Journal of Economics* 119 (4), pp. 1339-1382.

Bourguignon, Francois and Sebastien Dessus (2009). Equity and Development : Political Economy Considerations. In Levy, Santiago and Michael Walton (eds.), *No Growth Without Equity? Inequality, Interests and Competition in Mexico*. The International Bank for Reconstruction and Development/The World Bank.

Bridgman, Benjamin, Igor Livshits and James MacGee (2007). Vested Interests and Technology Adoption. *Journal of Monetary Economics*, 54: 649-666.

Caballero, Ricardo, Kevin N. Cowan, Eduardo M.R.A. Engel and Alejandro Micco (2006). Effective Labor Regulation and Microeconomic Flexibility. Cowles Foundation Discussion Papers 1480, Cowles Foundation, Yale University.

Carletti, Elena, and Phillip Hartmann (2003). Competition and Financial Stability: What's Special about Banking? In P. Mizen (ed.), *Monetary History, Exchange Rates and Financial Markets: Essays in Honour of Charles Goodhart*, Vol. 2. Cheltenham: Edward Elgar, pp. 202-229.

Chiquiar, Daniel (2005). Why Mexico's Regional Income Convergence Broke Down. *Journal of Development Economics* 77, pp. 257-275.

Chiquiar, Daniel, Edna Fragoso and Manuel Ramos Francia (2007). La Ventaja Comparativa y el Desempeño de las Exportaciones Manufactureras Mexicanas en el Periodo 1996-2005. Banco de México Working Paper 2007-12.

Chiquiar, Daniel and Manuel Ramos Francia (2008). A Note on Mexico and U.S. Manufacturing Industries' Long-term Relationship. Banco de México Working Paper 2008-8.

Census Bureau. Foreign Trade Statistics. Available at <http://www.census.gov/foreign-trade/statistics/index.html>.

Claessens, Stijn and Luc Laeven (2003). What Drives Bank Competition? Some International Evidence. The World Bank Financial Sector Operations and Policy Department. Policy Research Working Paper 3113.

Clark, Gregory (1987). Why Isn't the Whole World Developed? Lessons from the Cotton Mills. *Journal of Economic History* 47 (1), pp. 141-173.

Cole, Harold, Lee Ohanian, Alvaro Riascos and James Schmitz Jr. (2005). Latin America in the Rearview Mirror. *Journal of Monetary Economics*, 52: 69-107.

Comisión Federal de Competencia (2007). Opinión con el fin de promover la aplicación de los principios de competencia y libre concurrencia en los servicios bancarios al menudeo. April 24th, 2007.

Comisión Federal de Competencia (2009). Competencia en el crédito bancario al consumo. March, 2009.
http://www.cfc.gob.mx/images/stories/comunicacion/Presentaciones/2009/Propuestas_competencia_bancos.pdf

Comisión Federal de Electricidad (2005). "Programa de Obras e Inversiones del Sector Eléctrico (POISE) 2005-2014". México D.F.

Comisión Federal de Electricidad (n.d.). Retrieved February 6, 2008, from <http://www.cfe.gob.mx/Aplicaciones/QCFE/EstVtas/Default.aspx>

Comisión Nacional Bancaria y de Valores (n.d.). Retrieved February 6, 2008, from http://www.cnbv.gob.mx/default.asp?com_id=2

Comisión Nacional de Salarios Mínimos (n.d.). Retrieved January 29, 2008, from <http://www.conasami.gob.mx/formatestimonios.aspx?ID=13&int=0>

Congreso General de los Estados Unidos Mexicanos (2008a). Ley de Petróleos Mexicanos. Diario Oficial de la Federación, November 28, 2008.

Congreso General de los Estados Unidos Mexicanos (2008b). Ley de la Comisión Nacional de Hidrocarburos, Diario Oficial de la Federación, November 28, 2008.

Congreso General de los Estados Unidos Mexicanos (2008c). Reforma a la Ley de la Comisión Reguladora de Energía, Diario Oficial de la Federación, November 28, 2008.

Conway, Paul, Veronique Janod and Giuseppe Nicoletti (2005). Product Market Regulation in OECD Countries: 1998 to 2003. OECD Economics Department Working Papers 419, OECD Publishing.

Costinot, Arnaud (2007). On the Origins of Comparative Advantage. Unpublished manuscript. University of California, San Diego.

Cuñat, Alejandro and Marc J. Melitz (2007). Volatility, Labor Market Flexibility, and the Pattern of Comparative Advantage. NBER Working Paper 13062.

Del Villar, Rafael (2009). "Competition and Equity in Telecommunications". In Levy, Santiago and Michael Walton (ed.), *No Growth Without Equity*. Palgrave Macmillan and the World Bank: 321-364.

Dávila, Enrique, Georgina Kessel and Santiago Levy (2004). "El Sur También Existe: Un Ensayo Sobre el Desarrollo Regional de México". In Levy, Santiago (ed.), *Ensayos Sobre el Desarrollo Económico y Social de México*. Fondo de Cultura Económica: 512-577.

Energy Information Administration (EIA) (2007). Current and Historical Monthly Retail Sales, Revenues and Average Revenue per Kilowatt hour by State and by Sector (Form EIA-826) Retrieved February 6, 2008, from http://www.eia.doe.gov/cneaf/electricity/epm/table5_2.html

ENDESA Memorias anuales. Available at http://www.endesa.cl/Endesa_Chile/action.asp?id=00010&lang=esand

ENERSIS. Memorias anuales. Available at http://www.enersis.cl/enersis_web/action.asp?id=21760.

Gruben, William (2006). NAFTA, Trade Diversion and Mexico's Textiles and Apparel Boom and Bust. Southwest Economy 5, Federal Reserve Bank of Dallas.

Hall, Robert E. and Charles I. Jones (1999). Why Do Some Countries Produce So Much More Output Per Worker Than Others? The Quarterly Journal of Economics 114 (1), pp. 83-116.

Hanson, Gordon (1994). Antitrust in Post-privatization Latin America: An Analysis of the Mexican Airlines Industry. The Quarterly Review of Economics and Finance 34, pp. 199-216.

Hausmann, Ricardo, Jason Hwang and Dani Rodrik (2007). What You Export Matters. Journal of Economic Growth 12 (1). pp. 1-25.

Heckman James J. and Carmen Pagés (2004). Law and Employment: Lessons from Latin America and the Caribbean, NBER, U.S.

Herrendorf, Berthold and Arilton Teixeira (2004). Monopoly Rights can Reduce Income Big Time. Bank of Finland Discussion Paper 7/2004.

Heston, Alan, Robert Summers and Bettina Aten (2006). Penn World Table Version 6.2. Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. September 2006.

Holmes, Thomas and James Schmitz, Jr. (1995). Resistance to New Technology and Trade Between Areas. Federal Reserve of Minneapolis Quarterly Review, 19: 2-17.

Holmes, Thomas and James Schmitz, Jr. (2001). A Gain from Trade: From Unproductive to Productive Entrepreneurship. Journal of Monetary Economics 47, pp. 417-446.

INEGI. Banco de Información Económica (Economic information database at INEGI's website <http://www.inegi.gob.mx>).

Instituto Federal de Acceso a la Información Pública (IFAI), information from CFE, under request: 1816400070206. Available at <http://www.ifai.org.mx/>

International Energy Agency / OECD (2008). Energy Statistic databases available at: <http://www.iea.org/Textbase/stats/index.asp>

International Monetary Fund (2009). World Economic Outlook Database. IMF, U.S.A.

International Telecommunication Union (n.d.). World Telecommunication Indicators.

Islam, Roumeen (2004). Do More Transparent Governments Govern Better?. World Bank Policy Research Working Paper No. 3077 .

Jensen, Robert (2007). The Digital Divide: Information (Technology), Market Performance, and Welfare in the South Indian Fisheries Sector. Quarterly Journal of Economics 122 (3): 879-924.

Johnson, Harry (1955). Economic Expansion and International Trade. Manchester School of Economic and Social Studies 23: 95-112.

Jorgenson, Dale W. and Khuong Vu (2005). Information Technology and the World Economy. Scandinavian Journal of Economics 107 (4): 631-650.

Kaufmann, Daniel, Aart Kraay and Pablo Zoido-Lobaton (1999). Governance Matters. World Bank Policy Research Working Paper 2196. Available at <http://ssrn.com/abstract=188568>.

Khan, B. Zorina and Kenneth Sokoloff (2006). Institutions and Technological Innovation during Early Economic Growth: Evidence from Great Inventors in the United States, 1790-1930. In Eicher, Theo and Cecilia García-Peñalosa, Institutions, Development, and Economic Growth. CESifo Seminar Series, MIT Press, Cambridge, Massachusetts.

Krugman, Paul (1986). Pop Internationalism. MIT Press, Cambridge Mass.

- Krugman, Paul (1994). *Peddling Prosperity*. W. W. Norton & Company Inc. N. Y.
- Krusell, Per and José Victor Rios-Rull (1996). Vested Interests in a Positive Theory of Stagnation and Growth. *Review of Economic Studies*, 63: 301-329.
- Lagos, Ricardo (2006). A Model of TFP. *Review of Economic Studies*, 73, pp. 983-1007.
- Lederman, Daniel, William Maloney and Luis Servén (2005). *Lessons from NAFTA for Latin American and Caribbean Countries: A Summary of Research Findings*, World Bank, Washington, D.C.
- Levchenko, Andrei (2004). Institutional Quality and International Trade. IMF Working Paper WP/04/231.
- Levy, Santiago (2007). ¿Pueden los Programas Sociales Disminuir la Productividad y el Crecimiento Económico? Una Hipótesis Para México. *El Trimestre Económico* 74 (3), pp. 491-540.
- Levy, Santiago and Michael Walton (2009). No Growth Without Equity? Inequality, Interests and Competition in Mexico. The International Bank for Reconstruction and Development/The World Bank.
- Loayza, Norman, Pablo Fajnzylber and César Calderón (2005). *Economic Growth in Latin America and the Caribbean: Stylized Facts, Explanations and Forecasts*. The World Bank, Washington D.C.
- Luz y Fuerza del Centro (2005). *Informe de Autoevaluación 2005*. México, D.F.
- Luz y Fuerza del Centro (several years). *Informes de Labores*, 2000-2001, 2001- 2002, 2002-2003. México.
- Magyar Telecom (2007). Retrieved February 6, 2008, from http://www.magyartelekom.hu/english/doc/Q42006_eng.pdf
- Maloney, William and Guillermo Perry (2005). Towards an Efficient Innovation Policy. *Cepal Review* 87. United Nations, U.S.A.
- Manuelli, Rodolfo and Ananth Seshadri (2007). East Asia vs. Latin America: TFP and Human Capital Policies. Unpublished Manuscript.
- Martínez Chombo, Eduardo (forthcoming). Fuentes de Sobre-Costos y Distorsiones en las Empresas Eléctricas Públicas en México. *Economía Mexicana NUEVA ÉPOCA*, CIDE.
- Merrill Lynch (2007). *Global Wireless Matrix*. Third Quarter 2007.

Mia, Irene and Emilio Lozoya (2008). Assessing the Foundations of Mexico's Competitiveness: Findings from the Global Competitiveness Index 2007-2008. World Economic Forum.

Miketa, Asami (2004). Technical description on the growth study datasets. Environmentally Compatible Energy Strategies Program, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria.

Moavenzadeh, John (2008). The Changing Nature of Engineering in the Automotive Industry. In "The Offshoring of Engineering: Facts, Unknowns, and Potential Implications", Committee on the Offshoring of engineering, National Academy of Sciences.

Motta, Massimo (2004). Competition Policy. Theory and Practice. Cambridge University Press, NY.

Nickell, Stephen (1996). Competition and Corporate Performance. Journal of Political Economy 104 (4), pp. 724-746.

Nicoletti, Giuseppe and Stefano Scarpetta (2006). Regulation and Economic Performance: Product Market Reforms and Productivity in the OECD. In Eicher, Theo and Cecilia García-Peñalosa, Institutions, Development, and Economic Growth. CESifo Seminar Series, MIT Press, Cambridge, Massachusetts.

Norbäck, Pehr-Johan and Lars Persson (2008). Entrepreneurial Innovations, Competition and Competition Policy. Centre for Economic Policy Research Discussion Paper 6823.

Nunn, Nathan (2005). Relationship-Specificity, Incomplete Contracts and the Pattern of Trade, manuscript, University of Toronto.

OECD (2006). Mexico: Competition Law and Policy in 2005. Paris. <http://www.oecd.org/dataoecd/0/5/37028560.pdf>

OECD (2007a). PISA 2006: Science Competencies for Tomorrow's World.

OECD (2007b). Education at a Glance 2007: OECD Indicators.

OECD (2007c). Communications Outlook 2007. OECD, Paris.

OECD (2008). Broadband Statistics. Directorate for Science, Technology and Industry.

Okada, Yosuke (2005). Competition and Productivity in Japanese Manufacturing Industries. NBER Working Paper No. 11540.

Olson, Mancur (1982). *The Rise and Decline of Nations*. Yale University Press, New Haven.

Parente, Stephen and Edward C. Prescott (1999). Monopoly Rights: A Barrier to Riches. *American Economic Review* 89: 1216-1233.

Parente, Stephen and Edward C. Prescott (2000). *Barriers to Riches*. MIT Press. U.S.A.

Perez Motta, Eduardo (2007). A Commitment to Markets is Needed. *Financial Times*, 9th of May 2007.

Presidencia de la República (2006). Sexto Informe de Gobierno. Gobierno de los Estados Unidos Mexicanos, Ciudad de México, septiembre de 2006. Available at: <http://sexto.informe.fox.presidencia.gob.mx/index.php?idseccion=6>

Rajan, Raghuram (2009). Rent Preservation and the persistence of Underdevelopment. *American Economic Journal: Macroeconomics*. 1 (1), pp. 178-218.

Rajan R. and L. Zingales (1998). Financial Dependence and Growth. *American Economic Review* 88: 559-586.

Ramos-Francia, Manuel (2006). Crecimiento y Competitividad de la Economía Mexicana, *Revista de Administración Pública*, Instituto Nacional de Administración Pública (INAP) 112, pp. 131-159.

Restuccia, Diego and Richard Rogeson (2007). Policy Distortions and Aggregate Productivity with Heterogeneous Plants. NBER Working Paper No. 13018.

Restuccia, Diego (2008). The Latin American Development Problem. University of Toronto Department of Economics Working Paper No. 318.

Salgado, Hector and Lorenzo Bernal (2007). Multifactor Productivity and its Determinants: An Empirical Analysis for Mexican Manufacturing. Banco de México Working Paper 2007-09.

Schmitz Jr., James A. (2005). What Determines Productivity? Lessons from the Dramatic Recovery of the U.S. and Canadian Iron Ore Industries Following Their Early 1980s Crisis. *Journal of Political Economy* 113 (3), pp. 582-625.

Secretaría de Energía. Retrieved January 29, 2008, from <http://www.sener.gob.mx/webSener/res/304/PDF-CFE/CFE%20-%20VENTAS%20TOTALES.pdf>

Secretaría de Energía. Retrieved January 29, 2008, from <http://www.sener.gob.mx/webSener/res/304/PDF-LFC/LFC%20-%20VENTAS%20TOT.pdf>

Secretaría de Hacienda y Crédito Público (2007). La Reforma Hacendaria por los que Menos Tienen. Construyendo Juntos un México Más Justo. Available at <http://www.aplicaciones.hacienda.gob.mx/ucs/reformahacendaria/index.html>

Secretaría de Telecomunicaciones del Gobierno de Chile (Subtel) (n.d.). Retrieved February 6, 2008, from http://www.subtel.cl/prontus_subtel/site/artic/20070212/pags/20070212182348.html#T1

Securities and Exchange Commission (SEC) (n.d.). Securities Information from KT Corporation, Retrieved February 6, 2008, from <http://www.secinfo.com/d14D5a.u5wTa.htm>

Shy, Oz (2001). The Economics of Network Industries. Cambridge University Press.

Sturgeon, Timothy, Olga Memedovic, Johannes Van Biesebroeck and Gary Gereffi (2009). Globalisation of the automotive industry: main features and trends. International Journal of Technological Learning, Innovation and Development, Vol. 2, No. 1/2, pp. 7-23.

Telefónica S.A. (2007). Annual Report 2006. Retrieved February 6, 2008, from www.telefonica.com/eng

Teléfonos de México, S.A.B. de C.V. (Telmex) (2007). Retrieved February 6, 2008, from http://www.telmex.com/mx/esto/ri/pt_descarga.jsp?a=FolletoA.pdf

Tele Norte Leste Participações S.A. (Telemar) (2007). Annual Report 2006. Retrieved February 6, 2008, from http://www.telemar.com.br/ri/edite/EditeArquivo.asp?Nome=8_ARQUIVO_001&EditeCodigoDaPagina=3144

United Nations. Commodity Trade Statistics Database (Comtrade), Statistics Division. Available at <http://comtrade.un.org/db/>.

Vogel, Jonathan (2006). Institutions and Moral Hazard in Open Economies. Unpublished Manuscript.

Wolcott, Susan (1994). The Perils of Lifetime Employment Systems: Productivity Advance in the Indian and Japanese Textile Industries, 1920-1938. Journal of Economic History 54 (2), pp. 307-324.

World Bank (2006a). Mexico's Competitiveness: Reaching its Potential. Washington, D.C.

World Bank (2006b). Information and Communications for Development. Global Trends and Policies. Washington, D.C.

World Bank (2006c). World Development Indicators 2006. Washington, D.C.

World Economic Forum (2000). The Global Competitiveness Report 2000. Oxford University Press.

World Economic Forum (2006). The Global Competitiveness Report 2006-2007. World Economic Forum.

World Economic Forum (2009). The Global Competitiveness Report 2009-2010. World Economic Forum.

Yahoo Finance (n.d.) Information from China Telecom Corporation Limited, Retrieved February 6, 2008, from <http://mx.finance.yahoo.com/q/pr?s=CHA>

Young, Alwyn (1991). Learning by Doing and the Dynamic Effects of International Trade. The Quarterly Journal of Economics 106 (2), pp. 369-405.