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Assessing Telecommunications Policy in Mexico

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ABSTRACT

In 2012 the Organization for Economic Cooperation and Development (OECD 2012a) issued an assessment of Mexico's telecommunications industry. This report concluded that the performance of the sector, while improved, remains below attainable goals, and that the causes of the performance deficit are insufficient competition and ineffective regulation. The dominant telecommunications firm in Mexico, Telmex, responded to the OECD by commissioning two consulting reports (Hausman and Ros, 2012, and Sidak, 2012) that were highly critical of the OECD report. This article assesses the main criticisms of the OECD report by the Telmex consultants. The main conclusions are that both the regulatory policies and the performance of the industry are generally worse in Mexico than in peer nations, and that most of the criticisms of the OECD report by the Telmex consultants are not valid.

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by Roger G. Noll¹

I. INTRODUCTION

The recent report by the Organization for Economic Cooperation and Development (OECD) on Mexican telecommunications (OECD 2012a) makes two main points. First, the performance of the sector, while improved, remains below attainable goals. Second, the performance deficit is caused by insufficient competition and ineffective regulation. The report then offers numerous proposals for reforming Mexican telecommunications regulation to improve the performance of the sector.

Telmex responded to the OECD by commissioning two consulting reports that vigorously attack the OECD study on nearly every point. The report by Jerry A. Hausman and Agustin J. Ros (2012) addresses the performance of Mexican telecommunications and concludes that the OECD's negative assessment is based on faulty analysis. The report by J. Gregory Sidak (2012) argues that the reforms that the OECD proposed have been widely rejected elsewhere as ineffective or perverse and, if adopted, would only worsen the performance of the industry.

This article does not address all of the arguments in these reports. Instead, it focuses on two issues. The first is the relative performance of the telecommunications industry in Mexico.

1. Professor *Emeritus* of Economics, Stanford University, and Senior Fellow, Stanford Institute for Economic Policy Research. This article was written in response to a request by the editor of *El Trimestre Económico* for an independent assessment of the OECD report and the reports of the Telmex consultants. In the past I helped the OECD develop its program for reviewing the regulatory policies of OECD member nations and advised the World Bank and the Government of Mexico on Mexican telecommunications policy. I had no role in the preparation of the recent OECD report and have no consulting relationship with any Mexican communications entities.

The second is with regard to Mexican policies: whether Mexican telecommunications regulation departs from international best practice and whether the OECD's recommendations for regulatory reform in Mexico are reasonable.

The principal conclusions of this article are as follows. With respect to performance, the OECD's analysis generally is correct and the criticisms of the OECD report by the Telmex consultants are, for the most part, misplaced. With respect to policy, the OECD's analysis of Mexican regulation reflects the conclusions from scholarly research and the practices of peer nations in which the performance of the telecommunications industry is better than in Mexico. While some of the OECD's policy recommendations are controversial, none are unreasonable or outside the range of informed debate among scholars and practitioners of telecommunications policy. Indeed, my major concern about the OECD report and the responses by the Telmex consultants is that all give insufficient attention to the use of "calling party pays" as Mexico's general approach to telecommunications pricing and to the general issue of rate balancing (bringing relative prices more in line with relative marginal costs).

The structure of this article is as follows. Section II relates the OECD report to scholarly research and prior policy reports that deal with telecommunications in Mexico. Section III assesses the validity of the criticisms of the OECD's analysis by the Telmex consultants and presents additional information about the performance of Mexico's telecommunications industry. Section IV discusses regulatory governance of telecommunications in Mexico and the criticisms of the OECD's policy recommendations. Section V offers some concluding observations.

II. THE OECD REPORT IN CONTEXT

The reports by Telmex's consultants harshly criticize the authors of the OECD report for making elementary errors of economic analysis, ignoring relevant research on regulation in general and telecommunications in particular, having a pro-regulatory bias, and refusing to provide access to the raw data on which their analysis is based. The wording of these criticisms seems to suggest that the OECD report lacks a coherent method, was undertaken by people who are not experts in the field, and contains analysis and conclusions that differ widely from other studies. Such is not the case. The OECD report was written by professionals with established track records in evaluating regulatory policy and reaches conclusions that are similar to the conclusions in numerous other studies that have been published during the last two decades.

II. A. The OECD's Programs in Regulatory and Competition Policy

The OECD is a multinational organization for coordinating economic policies that was formed in December 1960 by 20 nations in Western Europe and North America. Among the original members only Turkey remains a developing nation. As of 2013 fourteen other nations have become members and another, Russia, is negotiating membership. The only OECD members in Latin America are Chile (2010) and Mexico (1994), and these plus Turkey are the only developing nations in the organization. Nevertheless, the OECD has substantial experience in assessing economic policy in developing nations. Five other developing nations (Brazil, China, India, Indonesia and South Africa) are designated as "key partners" by the OECD. While not voting members, key partners participate in many OECD activities. In addition, 41 nations – 24 members and 17 non-members – belong to the OECD Development Centre, including the three OECD members that are developing nations, four key partners (not China), five other Latin American nations (Argentina, Columbia, Costa Rica, Dominican Republic and Peru), plus Cape Verde, Egypt, Mauritius,

Morocco, Romania, Senegal, Thailand and Vietnam.

The OECD employs a professional staff that undertakes economic policy analysis on a wide variety of issues, including competition policy and regulation of infrastructure industries. Some studies focus on one industry or sector in a single nation, some examine a nation's regulatory and competition policies more broadly, some assess a nation's economic policy, and some compare an economic policy issue in a region (including Latin America), the entire OECD membership, or, in some cases, a larger group of nations. When undertaking these studies, the OECD often supplements its staff with consultants who are experts in the field, as was the case for the report on Mexican telecommunications.

OECD country reviews are undertaken at the request of the government to be reviewed.² Each industry study is undertaken according to a methodological framework that was developed by the OECD staff and formally adopted by OECD members.³ These studies are based on information that is voluntarily provided by OECD members and non-member affiliates. Thus, the OECD report on Mexican telecommunications uses the same analytical methods and data as the other OECD country reports on the industry.

In 1997 the OECD created a program to review regulatory reforms in member nations. Since then the OECD has issued many country reports on regulatory policies in both member states and several developing nations that are not members but that participate in OECD activities. As of January 2013, general reviews of regulation have been completed for 24 member states plus Brazil,

2. The fact that nations request reviews is the basis for Sidak's statement that Cofetel "hired" the OECD to produce the telecommunications report.

3. Policy review programs, methods of analysis, and evaluation studies must be approved at "ministerial" meeting by representatives from the relevant ministries of the member nations.

China, Indonesia and Russia. In November 2012 the OECD (2012c) published a general review of Mexican regulatory policies. The OECD also has undertaken country reviews of competition policy since 1998 and has completed reviews for 36 nations plus the European Union, including Mexico (OECD 2004).

With respect to telecommunications, the OECD has issued several country reports, including two on Mexico (OECD 1999, 2012a). The OECD also issues annual reports on telecommunications in the OECD. In odd numbered years this report deals with the industry generally (see OECD 2011), and in even numbered years it focuses on Internet services (see OECD 2012b). Mexico has been included in all of these reports since it became a member (the first telecommunications report that includes Mexico is OECD 1995).

In summary, the OECD has produced numerous reports on regulation and competition policy. These reports are based on common methods and data sets that have been developed by OECD staff and consultants over several decades. Both all reports and the methods used to produce them are reviewed and approved by the relevant agencies from the member states. The fact that most OECD members and many non-members have requested multiple country reports on regulation and competition policy indicates that the OECD's methods, if nothing else, are broadly accepted by OECD members. If the information in these studies were incorrect and if their recommendations were useless, the popularity of these reports – especially given that they are often critical of the government that requested them – is puzzling because a nation can avoid an evaluation simply by not asking for it. Given the history of OECD reviews of regulation in general and of telecommunications in particular, the structure, analytic methods, and even general conclusions of the 2012 report on telecommunications in Mexico were entirely predictable at the time it was requested.

II. B. Transparency

Hausman and Ros criticize the OECD for violating accepted protocols for transparency because it “refused to provide the data that it used” (p. 3). Hausman and Ros state: “With only one exception in the past ten years, the data on which regulatory determinations or policy recommendations are based have been available to all parties to the proceeding” (p. 4). This observation is a *non sequiter* because the member states, not the OECD, control access to the data that are used in OECD studies.

Hausman and Ros make a false analogy between an administrative process that is conducted by a regulatory agency in a single nation and a policy evaluation by the OECD that uses data from over 30 such agencies, each of which has its own rules regarding public access to data. Among other things, Telmex is not one of the “parties to the proceeding” before nearly all of the agencies that supply data to the OECD. A valid criticism of regulation throughout the world is that it is not transparent precisely because only “parties to the proceeding” have access to much of the relevant information on which policy decisions are based. The principal cause of a lack of transparency in regulatory processes is that regulated firms (including Telmex) insist upon maintaining the confidentiality of their data.

For telecommunications, this criticism is further vitiated by the existence of extensive public information on the industry. Hausman and Ros use two of these sources – the annual data report of the International Telecommunications Union and World Bank Indicators. A third commonly used source is the on-line World Fact Book of the U.S. Central Intelligence Agency. Thus, the failure of the OECD to provide its data to Telmex is not a serious barrier to conducting a comparative analysis of telecommunications policy among a large group of nations.

II. C. Other Studies of Mexican Telecommunications

In addition to OECD reports, several recent studies of Mexican telecommunications, either by itself or as part of a broader study covering multiple nations, have been published. Scholarly research from the current millenium includes Casanueva-Requart and Pita (2010), Del Villar (2009), Mariscal (2002), Mariscal and Rivera (2005), Noll (2009), Powell (2010), Solano, del Villar and Garcia-Verdu (2006), and Wallsten (2001). In addition, a World Bank (2003) review of infrastructure industries in Mexico includes a chapter on telecommunications. None of these studies are referenced by either Hausman and Ros or Sidak.

These studies address different aspects of the industry and use a variety of methods and data, but their conclusions are broadly consistent with the 2012 OECD report. The consensus view is that the performance of the telecommunications industry in Mexico, while improving, falls short of reasonable standards that are based on the performance of the industry elsewhere (including Latin America) and that the causes are insufficient competition combined with weak and sometimes misguided regulation. Regardless of one's evaluation of the analysis in in the OECD report, there is nothing unusual or surprising in it. If the conclusions in the OECD report are not valid, then all evaluations of Mexican telecommunications since the privatization of Telmex also must not be valid, including all independent refereed scholarly publications.

III. THE OECD'S METHODS

Hausman and Ros offer three main criticisms of the OECD's methods for evaluating Mexico's telecommunications industry: (1) the OECD erred by comparing Mexico with other OECD nations, all of which have higher per capita income and more equal income distribution than

Mexico; (2) the OECD erred in its analysis of mobile prices by using the wrong prices and quantities in comparing Mexico with other OECD nations; and (3) the OECD erred in using purchasing power parities (PPP), rather than market exchange rates (MER), in converting prices in domestic currencies to a common monetary unit. This section examines these criticisms and concludes that while each involves important issues about undertaking international comparisons of the telecommunications industry, the criticisms are at best overstated.

III. A. Comparison Nations

According to Hausman and Ros (p. 5), the OECD report fails a “common sense test” because it compares Mexico only to OECD members. The focus of their criticism is the OECD’s econometric estimation of telecommunications demand, which is used to estimate the loss in consumers surplus arising from Mexico’s higher prices. Hausman and Ros (pp. 5-6) point to three ways in which Mexico differs from the “average OECD country” in ways that affect demand – lowest per capita gross domestic product (GDP), second highest Gini index of income inequality, and lowest computer penetration. Sidak (p. 12) makes a similar criticism, stating that, with respect to broadband access, Mexico’s “seemingly low penetration rate appears to be primarily a demand-side issue” arising from low computer penetration and “the lack of compelling Spanish-language application or content for Mexican residential customers.”

Hausman and Ros are correct that a properly specified cross-country demand analysis should include income and other variables that plausibly affect demand, although computer penetration among consumers is likely to depend on the price and quality of Internet access and so should be treated as an endogenous variable in the telecommunications demand equation.

Moreover, if the goal of the analysis is to use an econometric model to evaluate the performance of

a specific country, Hausman and Ros are correct that the analysis is likely to be more reliable if the data set includes nations that are most like the country that is the focus of the analysis. In theory a properly specified econometric model could account for all of the relevant factors that cause differences in telecommunications performance among countries, but in practice the functional form of the estimating equation is unlikely to be absolutely correct, which magnifies the likelihood that the equation will do a poor job of estimating demand for a nation that is an outlier in the values of some independent variables. Thus, a data set that includes many similar nations is likely to produce a more reliable assessment of the performance of the target country.

To deal with possible biases arising from using only OECD members in the comparison, Hausman and Ros (pp. 16-17) evaluate Mexico's performance by comparing mobile and fixed line penetration among a group that includes Mexico and 16 other nations. Among this group, Mexico has the lowest penetration of mobile telephone service, the fifth lowest fixed line penetration, and by a wide margin the lowest total telephone penetration (mobile plus fixed). Nevertheless, Hausman and Ros conclude that Mexico's performance is not substandard. The test that they use is whether mobile and fixed line penetrations are within the 95 percent confidence interval of the mean for this group, using confidence intervals that are derived from the sample standard deviations of these variables.

The test that Hausman and Ros use has very low power. In their comparison set the 95 percent confidence interval for fixed line penetration is between zero and 55 lines per hundred inhabitants. Nearly all of the world falls within this range, including the least developed nations in the world and all but four other OECD members, among which are most of the richest nations in

the world.⁴ A conclusion to be derived from this test that the fixed line telecommunications networks are indistinguishable between the Democratic Republic of Congo (8 lines per 10,000 people) and the United States (48 lines per 100 people). For mobile telephones the 95 percent confidence interval is between 77 and 160 lines per hundred inhabitants. No OECD nation falls outside this range, and all nations with mobile penetration below this range have much lower per capita GDP than Mexico. In the Hausman and Ros comparison group, for each performance measure precisely one nation (Korea for fixed lines and Russia for mobile) falls outside these confidence intervals (both are above).

The statistical test performed by Hausman and Ros is meaningless. Telephone penetration is not plausibly characterized as a constant plus a random disturbance with mean zero. As Hausman and Ros state, telecommunications penetration depends on underlying demand conditions, the structure of the industry, and regulatory policies. The interesting question is not which 5 percent of nations have penetration that departs most from the average, but which nation's policies lead to something approximating the best achievable results, given their economic conditions.

A deeper problem with the Hausman and Ros analysis is that the relevant comparison is not necessarily with average performance among peer nations. The proper method to assess the adequacy of a nation's performance is to compare it with the *best cases* – the nations that adopt policies that produce the best performance, given similar economic conditions. If substandard regulatory institutions cause differences in economic performance among nations, average performance is below the performance that could be achieved with better policies. Most upper-

4. In 2010 fixed line penetration exceeded 55 per 100 population in eleven nations: Bermuda, Cayman Islands, France, Germany, Iceland, Korea, Malta, Monaco, San Marino, Switzerland and the U.S. Virgin Islands. According to the Hausman and Ros test, only these nations have better

middle-income nations (like Mexico) had state-owned monopoly telephone companies until the 1990s, adopted privatization policies that favored the incumbent (such as granting a period of continuing monopoly after privatization), and created weak regulatory and competition policy agencies (Noll 2000, Wallsten 2001, Mariscal and Rivera 2005, Powell 2010, Waverman and Koutroumpis 2011, and Roberts and Tapia 2013). Average performance among even the most well-off developing nations is not a reasonable standard because it continues to reflect less than optimal privatization and regulation policies.

Hausman and Ros refer to the group of countries that they analyze as a sample, implying that they are an unbiased subset of a relevant population. Hausman and Ros do not explain their procedure for selecting these countries. The rationale for using a sample from a small finite population is far from clear, especially given that their comparison group has a very small sample size (17). (The number of nations for which telecommunications data are available for comparative studies is roughly 220.) Whereas OECD members may not constitute the best comparison group for evaluating Mexican telecommunications, creating a smaller comparison group of heterogeneous nations does not solve the problem.

Table 1A shows per capita GDP, population, and the Gini index for the countries that are examined by Hausman and Ros. Eight of these 17 nations have much higher per capita GDP (above \$20,000) than Mexico. The group excludes many nations in which per capita GDP is much closer to Mexico's. Table 1B contains the same information as Table 1A for 18 more countries in which per capita GDP (PPP) is between \$10,000 and \$20,000 (compared to \$15,000 for Mexico). Of these countries, 11 have small populations (below five million); however, seven nations have

fixed-line penetration than the Democratic Republic of the Congo.

populations above seven million (the least populous nation in Table 1A is Israel at 7.7 million).

Including these nations in the analysis increases the number of nations with per capita GDP near Mexico's from three to eleven. Table 1C reports the same data for seven additional Latin American nations in which per capita GDP (PPP) is between \$4,000 and \$10,000. Like Mexico, all of these nations are former Spanish colonies that inherited Spanish language, culture and legal institutions.

As shown in these tables, high income inequality is present in almost all nations at Mexico's level of economic development. The Gini index for Mexico is greater than for all countries with per capita GDP above \$20,000. Among wealthier nations, the highest Gini index is 42.0 (Russia), and all of the others are less than 40. Among nations for which per capita GDP is below \$20,000, the Gini index is below 39 only for former socialist nations from the old Soviet bloc. Among nations that were not members of the Soviet bloc, the values of the Gini coefficients range from a low of 39 (Mauritius and Venezuela) to a high of 65 (South Africa), compared to 51.7 for Mexico. Among the 17 Latin American nations in these tables, Mexico's Gini index is the median for the group, and the unweighted average among these nations is 50.4. Hence income inequality cannot explain Mexico's relatively poor performance within this group.

Table 2A includes various telecommunications performance measures for all nations that fall within the \$10,000-\$20,000 range of per capita GDP (PPP), and Table 2B shows the same performance indicators for all of the Latin American nations that are included in Tables 1A, 1B and 1C. In Tables 2A and 2B nations are listed by per capita GDP in ascending order to make apparent the relationship between per capita GDP and telecommunications performance. All of these performance measures reflect the historical fixation of telecommunications policy makers on the number of people who subscribe to service, rather than the intensity with which they use it. The

reason for this fixation and how it distorts policy are discussed in the section on pricing.

Fixed line penetration (mainly wireline) in Mexico is lower than in most nations at Mexico's level of development. While per capita GDP in Mexico is about 10 percent above the median for the nations shown in Table 2A, Mexico's fixed line penetration is about 20 percent below the median. Among the ten Latin American nations with per capita GDP above \$10,000, Mexico ranks seventh in fixed line penetration compared to fourth in per capita GDP.

The low penetration of fixed line service is an inheritance from the pre-privatization era. At privatization Mexico adopted a goal of substantially increasing wireline penetration, which it then failed to achieve. Hausman and Ros assert that the growth in fixed lines Mexico did achieve is "all the more remarkable" (p. 13) because fixed line service has declined or grown slowly in both developing and developed countries. While Hausman and Ros are correct that fixed line penetration is declining in many wealthy nations (including the U.S.), this generalization is not accurate with respect to Mexico's peers.

Before the extensive reform and privatization of communications, fixed line penetration was low throughout Latin America. Subsequently it has not grown especially rapidly in Mexico. Table 3 shows fixed line penetration in the eight richest Latin American nations in 1991 and 2011. While fixed line penetration and growth in the poorer Latin American nations is comparable to Mexico's, among the Latin American nations with per capita GDP between \$11,000 and \$18,000 Mexico's performance is not "all the more remarkable." Only Panama and Chile have experienced growth in fixed line penetration that is as slow as Mexico's, and growth has been substantially greater in Argentina, Brazil, Costa Rica, Uruguay and Venezuela. Mexico's relatively low fixed line penetration compared to peer Latin American nations is important for two reasons. First, it indicates that Mexico's performance is nowhere near best practice among nations at its level of

development. Second, low fixed line penetration plays an important role in Internet access and data services.

Throughout the world wireless technology has become the dominant form of access to the telecommunications network. Mobile telephone penetration in Mexico is below all nations but one (Lebanon) that are included in Tables 2A and 2B. In Latin America, only Bolivia (83 mobile phones per 100 population), with per capita GDP (PPP) about one third of Mexico's, has mobile phone penetration roughly equal to Mexico's (82). Total penetration (fixed plus mobile) is below Mexico's in only Bolivia and the Dominican Republic. Guatemala and Honduras, both with per capita GDP below \$5,000, have greater total penetration than Mexico. These data show that Mexico does not represent best practice for a nation at its level of development.

Hausman and Ros correctly point out (p. 13) that mobile penetration often is inflated because many users carry a Simulated Identification Module (SIM) card (a circuit board that allows a mobile phone to connect to a carrier's network) for several carriers. Customers then use multiple SIM cards in the same wireless device.⁵ But this fact does not make comparisons of mobile penetration between Mexico and other nations misleading. As explained more fully in the next section, customers subscribe to multiple wireless carriers because tariffs are unbalanced (the basic monthly fee is low, the usage charge is high, and intra-network usage charges are far lower than inter-network usage charges). Thus, a user who regularly accesses customers on multiple networks has a financial incentive to subscribe to multiple networks in order to avoid inter-network use charges. Mexico is among the nations in which tariffs are unbalanced and, therefore, multiple

5. In some nations (including the U.S.) carriers can "lock" mobile telephones to prevent customers from using SIM cards for other carriers, forcing customers to use a different telephone for each carrier. For pre-paid customers multiple telephones are an inconvenience but not a source of

subscriptions to wireless carriers are common.

With respect to fixed broadband access, Mexico's performance is better than for telephone penetration. Among nations with per capita GDP below \$20,000, fixed broadband penetration exceeds 10 per 100 population in 13 of the 27 nations in Table 2A, but eight of these countries are members of the former Soviet bloc, where generally fixed line penetration is much higher than in other nations at the same level of development. Among Latin American nations (Table 2B), only Chile and Uruguay have higher fixed broadband penetration than Mexico and Argentina, which are essentially tied for third place.

Mexico lags in its number of Internet users. Except for three African nations (Botswana, Gabon, and South Africa), Mexico has the smallest proportion of Internet users among nations with per capita GDP between \$10,000 and \$20,000. Among Latin American nations, the proportion of Internet users is lower in Mexico than in every nation with per capita GDP (PPP) above \$11,000. Mexico's proportion of Internet users is higher than in the Dominican Republic, lower than in Columbia, and about the same as in Peru, all of which have per capita GDP (PPP) within a few hundred dollars of \$10,000.

The data in Tables 2A, 2B and 3 refer to measures of penetration – the proportion of the population that subscribes to a service. The focus on penetration reflects the historical preoccupation of the industry and policy makers with measuring performance on the basis of who *can* use service, not *how much* service they use. Table 4 shows data for Latin American nations on international Internet use. These data show that international use of the Internet in Mexico is about two-thirds of the average for Latin America. Among wealthier Latin American nations,

additional charges.

international Internet use in Mexico is below all nations except Venezuela, less than half the group average, and only a third or less of the best performing Latin American peers.

Collectively the data on telecommunications performance show that Mexico has an underperforming telecommunications industry. Comparisons with other Latin American nations are especially useful because these nations have similar languages, cultures, ethnic diversity, legal institutions, and income inequality. Moreover, in nearly all of Latin America, a former state-owned monopoly was privatized only relatively recently, and the same two companies, Telcel and Telefonica, dominate the industry (see Mariscal and Rivera 2005 and Powell 2010). Mexico's poor performance among Latin American nations cannot be explained on the basis of the level and distribution of income, the availability of "compelling Spanish-language content," culture, inherited institutions, or the historical dominance of state-owned monopoly.

III. B. Constructing Price Comparisons

To compare prices of telecommunications services, the OECD report estimates monthly bills for a variety of "baskets" of services, as shown in Table 5. The baskets fall into three categories: residential fixed line, business fixed line, and mobile. In each category the OECD calculates a total monthly bill for different amounts of usage. The OECD also examines prices for broadband access and Internet web sites. The OECD report (p. 32) finds that for nine of the eleven baskets of telephone service (a type of service and a hypothetical number of calls) the monthly charge in Mexico exceeds the average monthly charge for all OECD members and that in every case the charge in Mexico is far above the lowest charge in the OECD.

Hausman and Ros criticize the OECD's procedures for calculating prices for baskets of services and usage for mobile telephony as follows (p. 7). "The OECD achieved its conclusions

that mobile prices are high in Mexico by ignoring actual market prices and incorrectly using price data. The OECD thus has incorrectly claimed an increase in prices and harm to consumers that did not occur. This flaw undermines the entire OECD study.” Regardless of the merits of the OECD’s methods in comparing mobile prices, this statement is inaccurate.

The OECD did not state or imply that mobile prices in Mexico had increased. The statement by Hausman and Ros is based on the fact that the 2011 *Communications Outlook* (OECD 2011) used a new procedure for calculating Telcel’s mobile prices that included discounts from official tariffs. The 2012 OECD report used the procedure for calculating mobile prices that had been used in *Communications Outlook* prior to 2011, which did not take discounts into account. As a result the prices for baskets of mobile services in Mexico are higher in the 2012 report than in the 2011 *Communications Outlook*. But the OECD did not state or imply that these differences indicate that prices had increased. To the contrary, the report states: “Prices have also declined in Mexico” (OECD 2012a, p. 30). In addition *Communications Outlook* (OECD 2011, p. 251) cautions against comparing prices from different time periods, stating that “data in different periods of this collection process (e.g., data from the previous year) are not always comparable, given that the benchmark formulas have been revised over time.”

The statement that the OECD study of Mexican telecommunications is undermined by the use of the older method for calculating mobile prices also is inaccurate. *Communications Outlook* (OECD 2011) and the OECD (2012a) report on Mexico reach essentially the same conclusions about fixed line service and broadband services. *Communications Outlook* (OECD 2011, pp. 252-75) compares prices and service qualities among OECD members for many services and finds that for the six baskets of business and residential fixed line services and for high-speed and low-speed broadband Mexico’s prices rank between first and fifth highest among OECD members. For

mobile services, once discounts are taken into account, Mexico ranks in the middle for post-paid baskets. The only price in Mexico that is substantially below the OECD average is for the prepaid basket that includes 40 calls per month.

Hausman and Ros (p. 8) state that the OECD's price calculations for mobile services "do not make economic sense" because "the OECD does not use market data for what consumers actually pay for mobile services. Instead, it takes averages of hypothetical baskets of usage and calculates prices using tariffed rates." This critique has two components. First, the hypothetical baskets, each of which includes an assumed amount of usage, are not clearly connected to average or typical use by Mexican customers. Second, the OECD's estimated prices for mobile usage in Mexico are higher than average OECD prices because the OECD ignores the discounts from tariff prices for calls that originate and terminate in the same network.

These criticisms by Hausman and Ros would be valid if the goal of the analysis were to construct a cross-country price index for telecommunications services in which the quantity weights reflect existing patterns of use in Mexico. A cross-country price index is constructed from the sum of quantity-weighted prices in each of several countries in the same year. In calculating these sums, the same quantity weights are used for all countries. Price levels among nations can then be compared by dividing the sum of quantity-weighted prices for a particular nation by the same sum for the country that serves as the base for the index.

The OECD's approach does not produce a cross-country telecommunications price index because it does not aggregate prices for baskets into a single measure. Instead, the OECD's method compares the prices of different types and use intensities for several service combinations. The value of this approach is that prices for various baskets shed light on whether the price structure favors one type of service (e.g. mobile versus fixed or business versus residential) or

more or less intensive users.

Although Hausman and Ros do not fully explain their criticism of the OECD's use of hypothetical baskets of services, a plausible inference is that they believe that a price index for telecommunications services is a good indicator of relative prices among countries, that the best weights for constructing this price index are the quantities of services that are purchased in Mexico, and that many, if not most, of the baskets that the OECD uses are irrelevant to the telecommunications price index for Mexico because Mexican sales of high-priced post-paid baskets with high usage are relatively low. Recall that Mexico has higher penetration of prepaid mobile service (around 90 percent of mobile subscribers) but lower penetrations of fixed line and Internet services. If quantity weights that reflect experience in Mexico were used to calculate a price index, substantial weight would be placed on prepaid service and less weight on Internet and fixed line services. In Mexico the price for the low-use prepaid bundle is below the OECD average while Internet and fixed line prices are above average. Thus, a greater weight on prepaid service leads to a lower estimate of relative prices in Mexico.

The argument by Hausman and Ros that the telecommunications price index ought to be based on quantity weights from Mexico is related to an issue that international economists and economic historians have debated for decades. Comparative price indexes between countries, or within the same country at different times, typically are sensitive to the choice of quantity weights. In cross-sectional comparisons of prices among a group of nations, the price index for a given nation at a given time almost always is lowest if the quantity weights in the price index are the actual quantities from the same nation in the same time period. One reason for this outcome, called the Gerschenkron Effect (Jonas and Sardy, 1970), is that demand curves tend to be negatively sloped and elastic, implying that when the price of a good is relatively high, the quantity sold and

total sales revenue are relatively low.

The Gerschenkron Effect does not imply that high prices for products with low sales are irrelevant in assessing the performance of an economy. If demand is elastic, a high price that exceeds marginal cost causes a distortion in output, which makes a high price potentially of great interest. The problem with focusing exclusively on creating a price index that places a large weight on prepaid service is that it masks major distortions in Mexico's price structure.

The telecommunications industry has two types of prices.⁶ The first is "access" prices: a fee to initiate a service (sometimes called an installation or hook-up charge) and a monthly fee (sometimes called a subscriber charge), neither of which depends on use. The second category is usage prices, such as a charge for each telephone call, text message, or gigabit (gb) of data. The choice of quantity weights for prices in a price index is important because average usage per customer varies widely among nations, in part because nations differ in pricing policies.

Historically, nearly all nations set access charges far below the annualized average fixed cost of access to the network. Usage charges then were set above marginal cost to generate a subsidy for access. The goal of this policy was a specific conceptualization of "universal service:" to maximize penetration. This policy goal explains why telecommunications authorities tend to evaluate performance on the basis of penetration. Higher usage prices lead to lower usage per customer, an effect that is ignored if the industry is evaluated solely on the basis of penetration. In comparing prices between two nations, if the quantity weights on usage prices are from a nation with high usage prices, the price index for that nation will be lower than if the weights on usage prices are the quantities from a nation in which usage prices are low.

6. For a comprehensive analysis of telecommunications prices that discusses the distortions arising from inefficient pricing policies, see Laffont, Rey, and Tirole (1998a, 1998b).

In Mexico and many other developing nations wireless carriers offer prepaid mobile telephone service at a very low fixed charge (often, as in Mexico, zero) combined with usage charges that are far above marginal cost. Due to high usage charges, many customers who acquire prepaid service rarely make telephone calls. Thus, the issue of selecting the quantity weights in the price index is actually an issue about how best to take into account the large number of prepaid customers who have low access prices, high usage prices, and low usage.

The existence of low-cost prepaid service clearly makes prepaid consumers better off than they would be if no such service were available and all of the other baskets of services remained available at current prices. Moreover, the choice of prepaid service is likely to be driven to some degree, although not exclusively, by income.⁷ In nations with higher per capita income, prepaid service normally is taken by a much smaller proportion of the population.

The policy debate in Mexico about prepaid service is a manifestation of a debate that has been underway for decades: the value of cross-subsidies from usage to access as a means to promote universal service in the form of penetration. The concensus among economists is that cross-subsidization is undesirable because it distorts use and does not target subsidies to provide the greatest social benefit (see Crandall and Waverman 2000 on cross-subsidies in U.S. telecommunications, and Noll and Wallsten 2006 on this policy in India).

The attraction of prepaid service to Mexican consumers arises because the difference in price between prepaid and other telecommunications services in Mexico is relatively high.⁸ If a

7. Prepaid service is attractive to all customers who make few calls, which is not just the poor. For example, prepaid service is a way to acquire wireless telephones for teen-age children or employees at remote work locations without risking high usage bills.

8. The validity of the claim that prices are high in Mexico hinges on using purchasaing power parity

price index were constructed from quantity weights that were the amount of usage that Mexicans plausibly would buy if other prices were relatively lower, much greater weight would be placed on usage, especially of data services. Below-cost prepaid wireless access fees partially offset the harm from high prices for usage, but lower utilization of the network that arises from high usage fees still is a source of large and growing economic inefficiency.

When Telmex was privatized, nearly all use of the telecommunications network was for voice communications. Today nearly all network use is for data services. For example, the bit rate (number of bits per second) for listening to a streaming Internet music service typically is between 48 and 192 kilobits per second (kbs), compared to 4 kbs for a voice telephone call. High usage prices suppress both voice and data usage, and the latter slows the diffusion of Internet services. Low quantity weights on usage minimize a serious performance issue: low Internet use arising from high usage prices and low network quality. If the only concern of policy makers is penetration, then a relatively high weight on the cheapest form of access is appropriate; however, if policy makers care about diffusion of data services, an index based on Mexican quantity weights is not useful.

The issue of discounts for wireless usage also is more complicated than simply taking into account actual prices rather than posted tariffs. In Mexico the discounts in question pertain to lower usage charges for calls that originate and terminate on the same network. As shown in *Communications Outlook* (OECD 2011), in Mexico discounts for intra-network calls are huge, reducing monthly bills by about 20 percent below the charges that would be imposed if all usage

rather than market exchange rates for comparing prices among nations. This issue is discussed in the next section. But the claim that the ratio of prepaid service to other types of service (including usage) is low in Mexico remains true regardless of which method is used.

were billed at posted tariff rates. These discounts, while providing benefits to consumers compared to paying the posted tariff for all calls, are both symptoms and causes of distortions.

The OECD report recommends eliminating discounts for on-network calls. The OECD report notes that this policy increases a wireless carrier's penetration because it takes advantage of "club effects" created by "tariff-mediated network externalities" (OECD 2012a, p. 68). Sidak criticizes this analysis (p. 16). "Contrary to what the OECD appears to believe, club effects are not market failures. They are market *attributes*... When the OECD speaks of a 'club effect,' I understand it to mean the economic effects that arise from a closed user group... The consequence of a closed user group is that a mobile subscriber will pay attention to the prices paid by others who call her, which places competitive pressure on mobile carriers to keep prices low." This passage is incorrect in five ways.

First, a network externality is a public good. If one person subscribes to telecommunications service, other subscribers obtain the ability to connect to that person. Contrary to Mr. Sidak's statement, a public good is an example of a market failure because the private incentive to subscribe is less than the social benefit of subscription.

Second, the theory of clubs, originally due to Buchanan (1965), deals with circumstances in which the benefit of a public good is not equal among all persons. A network externality is a good example of a club effect. While subscribing to the telecommunications network creates a public good, the value of the subscription externality varies among subscribers: higher for family, friends and fellow workers than for people who have no personal or business reason to communicate with the subscriber.

Third, a network externality has nothing to do with caring about the price that others pay except insofar as one subscriber may benefit from subsidizing access for another subscriber who

otherwise would not pay the subscription fee. The reason that public goods create a market failure is precisely because coordinating the optimal structure of subsidies among subscribers is unlikely to be feasible.

Fourth, a “tariff-mediated network externality,” a far from felicitous phrase, refers to a *pecuniary* externality that is created by the policies and practices of carriers. If all carriers are fully interconnected, each subscriber can communicate with every other subscriber, and the network externality from subscription does not depend on the identity of a subscriber’s carrier. If each carrier sets the same use price for all connections, regardless of whether the communication terminates on the same carrier’s network, a subscriber does not care which carrier is selected by people for whom that subscriber has a high value for the network externality. A tariff-mediated network externality is created when a carrier sets a higher price for inter-network communications, thereby creating an incentive for subscribers to choose the same network. If inter-network and intra-network connections have the same cost, then the incentive to coordinate on a single network is purely pecuniary – no social costs are avoided and no social benefits are captured if all members of a group choose the same carrier. The cost saving from originating and terminating a call on the same network is between extremely small and non-existent, but in Mexico the discounts for intra-network calls are large. Thus, the price difference between intra-network and inter-network calls is pure price discrimination.

Fifth, another way in which the network externality is tariff-mediated is that the ability and incentive to engage in price discrimination arises from Mexico’s pricing policy. Mexico has adopted “calling party pays,” in which both origination and termination charges are paid by the person who initiates a connection. Price competition among wireless carriers occurs with respect to fixed access charges and the charge for call origination, but not for call termination. The reason is that a

customer who subscribes to only one carrier can be reached only over that carrier's network, giving a carrier monopoly power over termination to its customers. The only pathway for competition in termination is with respect to discounts for placing calls to customers of the same carrier. Such discounts are a plausible avenue for access competition to the extent customers can influence carrier choices by others, which may be possible among family members, close friends, members of affinity groups or employees of a firm.

High prices for inter-network termination cause a serious distortion. Customers who place a substantial number of calls have a financial incentive to obtain access service from multiple carriers so that more of their calls will be charged at discounted intra-network fees. Prepaid mobile service with a zero monthly access fee gives customers an inexpensive way to increase the number of calls that qualify for the discount by obtaining access to multiple networks at no monthly cost. As discussed in the previous section, to the extent that customers obtain prepaid access from multiple carriers, the total number of wireless access lines exceeds the number of Mexicans who have access. Thus, the ratio of access lines to population overstates Mexico's progress in achieving universal service.

The OECD's proposal to eliminate discounts for on-network calls would eliminate the pecuniary externality for coordinating choice of carriers that arises from price discrimination, and would cause competition in origination to affect prices for inter-network termination. But the elimination of discounts does not lead to competitive use prices. Each carrier still can charge other carriers a monopoly wholesale price for terminating calls. This overcharge is then passed through in the blended price for origination and termination of all calls.

In principle the monopoly power of carriers in call termination can be vitiated by effective regulation, assuming that the regulator has the technical and legal capacity to cap termination

charges at something approximating average cost per call. While calling party pays pricing is widely used in advanced economies, usage prices in these nations usually are lower than in Mexico because regulation succeeds in curtailing the monopoly power of carriers in terminating calls. But regulation generally is not always effective in curtailing monopoly power in termination, especially in developing nations with their weaker regulatory institutions.

In Mexico inter-network termination charges are negotiated bilaterally between each pair of carriers, which essentially is a mechanism for carriers to set a common monopoly price. Cofetel is empowered to intervene to lower the negotiated fee after the Federal Competition Commission (Cofeco) finds that a carrier is dominant in termination. Using this procedure Cofeco and Cofetel have succeeded in lowering inter-network terminating access charges, but the difference between inter-network and intra-network charges for usage indicates that the carriers still exercise substantial market power in call termination.

The alternative to regulation of terminating usage charges is to adopt “bill and keep” pricing, in which the caller pays the origination charge and the call recipient pays the termination fee. Bill and keep causes carriers to compete on all prices, including termination fees. Nations that use bill and keep generally have lower usage prices and greater usage (Littlechild 2006).

A valid criticism of the OECD report is that it does not adequately address problems with the calling-party-pays policy, especially in a nation that lacks strong regulatory institutions. The phrase “tariff-mediated network externalities” is really about how the calling-party-pays policy creates a market failure where none need exist. The reports by the Telmex experts do not address this issue.

III. C. Currency Conversion for International Price Comparisons

The OECD report concludes that telecommunications prices generally (although not for prepaid access) are high in Mexico. To compare prices among nations requires converting domestic prices in each currency to prices in a common monetary measure. In comparing prices in an infrastructure industry the OECD's standard practice, as well as the standard practice in published research, is to use purchasing power parity (PPP) to convert prices to a common monetary unit. PPP is a price index that measures the domestic purchasing power of a national currency. PPP is based on the cost in the domestic currency of purchasing a specified bundle of goods. The alternative to PPP is to convert prices in different currencies to a common monetary unit by using the market exchange rate (MER).

Hausman and Ros criticize the OECD for using PPP rather than MER to convert the peso prices of telecommunications services into a measure that is comparable to the prices in other nations. The validity of this criticism is important. Hausman and Ros (pp. 11-12) show that if the prices of the OECD's baskets of services are converted using MER, Mexican prices are below the OECD average. The cause of this difference is that in general when Mexican prices are converted to dollars or euros using MER, the prices of most goods are much lower in Mexico than in other OECD nations. Likewise, Mexico's per capita GDP in dollars or euros is much higher if peso per capita GDP is converted using PPP rather than MER.

This result is not unique to Mexico. In developing nations per capita income in dollars usually is substantially higher if the domestic currency is converted using PPP rather than MER. As shown in Table 6, the ratio of MER to PPP is comparably distorted in most of Mexico's peer group within Latin America. Among the ten Latin American nations with per capita GDP (PPP) between \$10,000 and \$20,000, only two – Brazil and Uruguay – have a PPP/MER ratio near one. In the other eight (including Mexico), per capita GDP is much higher if PPP is used to convert

currencies to dollar equivalents. The issue in choosing between MER and PPP for converting prices to a common monetary unit is *not* that the choice alters Mexico's standing among peer nations in terms of prices for telecommunications services, but instead whether PPP leads to inappropriate conclusions about telecommunications prices among Mexico and its peers compared to advanced industrialized countries.

Hausman and Ros do not fully explain why they prefer MER to PPP for converting prices in different nations to a common currency. Hausman and Ros offer two criticisms of the use of PPP: (1) PPP should be used only for comparing aggregate economic measures, such as GDP, and (2) PPP, because it is a price index, "inherits the problems of price indices in individual countries, especially in their incorrect treatment of new goods or improved goods, both of which are important factors for mobile telecommunications" (Hausman and Ros 2012, p. 9).

Regardless of their merit, these criticisms do not imply that using MER to convert domestic prices to dollars or euros is superior to using PPP. The reason that the OECD and other international organizations use PPP, rather than MER, to compare prices and real economic activity among nations is that "when the GDPs and component expenditures of countries are converted to a common currency with PPPs, they are valued at the same price level and so reflect only differences in the volumes of good and services purchased in the countries" (OECD 2006, p. 13). PPP is genuinely a price index, so expenditures divided by PPP prices are genuinely a measure of quantity. MER is a price: the price of one currency in the monetary unit of another. With no transportation costs, no direct (tariffs, quotas) or indirect (regulations) barriers to trade, free movement of factors of production, perfect information about prices and qualities for all goods and services produced everywhere, and no distortions due to domestic fiscal and monetary policy, the "law of one price" plausibly would be true, and the ratio of MER to PPP would be very near one.

The MER/PPP ratio diverges from one because these assumptions are not true. Developing economies are subject to fluctuations in exchange rates arising from all of these factors, including currency speculation and volatile flows of financial capital. The advantage of PPP over MER is that it is a genuine price index.

Hausman and Ros argue that the OECD's use of PPP for comparing international prices for telecommunications services conflicts with both the relevant research literature and the OECD's own recommendations about appropriate uses of PPP. Specifically, Hausman and Ros (p. 10) cite Deaton and Heston (2010) for warning against "comparisons between countries whose economies are very different" and the OECD's manual about PPP (Eurostat and OECD 2006) as recommending against "price level comparisons at low levels of aggregation."

The issue that underpins these statements is that many goods that are produced in one country are simply not present in other countries. The examples used by Deaton and Heston (2010, p. 4) are comparing prices of rice and tuff between Thailand and Ethiopia. Reliable comparisons of these prices are impossible because tuff is not sold in Thailand and rice has limited availability in Ethiopia. The concern raised by Deaton and Heston and in the OECD manual is that *some* disaggregations (such as a comparison of grain price indexes for Ethiopia and Thailand) are unlikely to be meaningful because of an unsolvable data problem. Multiplying rice and tuff prices by MER does not solve this problem.

The claim that the OECD report on Mexico is inconsistent with the OECD's recommendations concerning the use of PPPs is not accurate. As discussed above, the OECD has used PPPs to convert prices and expenditures in telecommunications and other infrastructure industries from domestic currencies to dollars or euros for many years in numerous reports. Likewise, the Eurostat-OECD manual does not generally recommend against the use of PPP at the

industry or even the firm level of disaggregation. For example, the most recent manual (Eurostat and OECD 2012, p. 32) describes the uses of PPP as follows. “PPP are used to convert national expenditures on product groups, aggregates and GDP of different countries into real expenditures... The PPPs and real expenditures for GDP are undoubtedly the most important, but the PPPs and real expenditures below the level of GDP are also useful in their own right. With them international comparisons of price and volume levels can be made for product groups and aggregates as well as GDP.” The manual then provides some examples of uses (p. 34). “Public enterprises apply PPPs when comparing their prices and operating costs with those of similar public enterprises in other countries. Private firms operating in different countries apply PPPs for the purposes of comparative analysis involving prices, sales, market shares, and production costs.” In brief, the concern about the use of PPPs (Eurostat and OECD 2012, pp. 17-18) pertains to whether the comparison involves products that are representative of the category of products that are available in the nations for which comparisons are made and for which reasonably accurate price data are available.

The problem of accounting for new or improved goods in a price index is an extreme example of the Gerschenkron Effect. Before a good is introduced, it has neither a price nor a quantity of sales, which means that in constructing a price index the new goods problem is essentially the same as the rice-tuff problem described above in which neither price nor quantity is observed for a product in one country. In analyzing the welfare gain from the introduction of mobile telephony, Hausman (2010) has proposed using the lowest price for which the quantity demanded would be zero (the “virtual price”) for the period before a product is introduced. While this procedure provides a measure of the gain in consumers surplus arising from the introduction of a

new product,⁹ it does not solve the problem of constructing a meaningful time series price index because the pre-introduction quantity still is zero. If the quantity weight in the index is the quantity in the pre-introduction period, then a zero weight is assigned to the actual price that consumers pay in post-introduction periods. If a post-introduction sales quantity is used in constructing the index, a virtual price that no one paid is given substantial weight in the pre-introduction periods.

Hausman and Ros do not explain why this problem is relevant to cross-country comparisons of price levels after a product has been introduced in all countries. Mobile telephone penetration in Mexico, while low, is hardly zero, so the new goods problem does not apply to wireless telephony in recent years. One possible issue is that the diffusion of new wireless technology – 3G and 4G networks and related equipment, such as smart phones and wireless-enabled computers – has been slower in Mexico than in other nations. Accounting for quality differences in a price index is difficult, but the OECD price comparisons avoid this problem. The OECD's baskets of services for price comparisons include only telephone calls, not data services for which the quality of service depends on the speed of connections.

To the extent that the relatively low quality of service in Mexico is not taken into account, real telecommunications prices in Mexico are understated in the OECD report and in the adjustments made by Hausman and Ros. Even the comparison of high-speed broadband access, which shows that Mexico ranks at or near the most expensive, must be qualified by the fact that the maximum broadband speed available in Mexico is the lowest among all OECD nations (OECD

9. This procedure has been criticized because it implies that the cutoff price at which demand is zero can be estimated, even though the cutoff price is never observed and its estimation requires forecasting a value that is outside the range of observations of the dependent variable.

2011, p. 272). Similarly, the World Economic Forum “Network Readiness Index” (Dutta and Bilbao-Osorio 2012) ranks Mexico 69th in cellular subscribers who have data access, 77th in business Internet use, 86th in the use of virtual social networks, 89th in the availability of bandwidth for international internet use, 94th in accessibility of digital content, and 104th in the impact of information and communications technology on access to basic services. Thus, Mexican customers receive less quality-adjusted service per dollar-equivalent spent than customers in most peer nations as well as among OECD members.

IV. REGULATORY POLICIES AND INSTITUTIONS

The policy recommendations in the OECD report (pp. 9-11, 120-30) are derived from the OECD’s assessment of the performance of the industry. The OECD (p. 113) concludes that “the unsatisfactory performance of the telecommunications industry in Mexico is the result of the relentless behavior of an incumbent fixed and mobile provider with significant market power and a dysfunctional legal system that promotes an inefficient industry...” The report then proposes numerous reforms that are based on “best practice” policies in OECD nations. The OECD summarizes its extensive review of the recent history of telecommunications regulation in Mexico as follows (p. 114).

“Many regulatory instruments present in most, if not all other OECD countries, are absent in Mexico [such as *ex ante* access regulation, including local loop unbundling; asymmetric regulation of dominant operators; cost-oriented interconnection requirements; Reference Interconnection Offers; and mandated functional separation]. Inadequate compliance assessment, uncertainty and long delays in regulatory decision-making are common. Penalties are inadequate to deter repeated anticompetitive and predatory conduct and, consequently, the dominant operators appear to disregard important determinations made by the regulator.”

The OECD report acknowledges that Mexican telecommunications regulation has some

strengths. Among these are (p. 116): a legal framework for a pro-competitive policy; modern competition law and an effective competition enforcement agency (Cofeco); a sectoral regulator (Cofetel) that is not but could be independent of the industry; a market-based system for allocating spectrum; progress in addressing the interconnection problem by adopting cost-based prices; the introduction of new backbone network capacity by the state-owned electric utility (the Federal Electricity Commission, or CFE); and recognition by government officials that the industry can and should be competitive.

Notwithstanding these strengths, the OECD identifies structural weaknesses in the system for regulating telecommunications, including an outdated legislative mandate, the procedures and standards for granting amparos (injunctions) against new regulations while they are under the protracted process of judicial review, and excessive involvement in regulation by the Secretary of Communications and Transportation (SCT) in granting concessions and reviewing decisions by Cofetel (a “double window” for regulatory decisions).

The OECD recommends changes in both specific regulatory policies and the structure and processes of the governance of the industry (pp. 120-130). Among the OECD’s policy recommendations are the following (the Sidak report does not mention most of these proposals, but does explicitly criticize the proposals that are shown above in italics):

*Impose mandatory national roaming requirements on facilities-based mobile carriers;
Increase the maximum fines that Cofetel can impose on carriers to deter
noncompliance*

with regulations.

*Allow Cofetel to engage in ex ante, cost-based regulation of interconnection prices,
rather than wait for disputes to arise from bilateral negotiations between
carriers;*

*Require provision of access to “bottleneck” facilities in monopoly service areas
 (“asymmetric regulation”), including local loop unbundling;*

*Allow Cofetel to impose structural separations requirements on carriers that abuse
market power to obtain competitive advantage in another market;*

Permit entry of telecommunications firms into multichannel video distribution and cable television into telecommunications, including broadband access, *with entry of Telmex into cable television permitted after Telmex is subjected to asymmetric regulation of telecommunications*;

Relax restrictions on foreign ownership of fixed-line telecommunications networks;

Replace concessions that are negotiated between SCT and individual carriers with a more formulaic “type-license” system;

Reduce the service obligations that are imposed in concessions;

Consolidate local calling areas and require that Telmex provide local interconnection in parts of consolidated areas in which competition is absent;

Permit entry of two additional national over-the-air television networks;

Give Cofetel exclusive authority to implement price-cap regulation of Telmex’s end-user services and change the price-cap system to make it more pro-competitive;

Allocate more spectrum to mobile services to expand wireless broadband access; and

Either clarify or abandon universal service policy.

The OECD report contains four principal proposals for changing the governance structure of telecommunications regulation. These are: (1) change the system of judicial review to eliminate amparos, or temporary suspensions of regulations while they are under review by the courts; (2) change the role of the SCT in the regulatory process by clearly delineating the exclusive domain of Cofetel and limiting the role of SCT in this domain to being a party that can submit evidence and argument in Cofetel’s process for developing regulations; (3) give Cofetel the authority to engage in asymmetric regulation of dominant carriers without obtaining a finding from Cofeco that a carrier is dominant; and (4) make the regulatory process more transparent by publishing more information about the performance of the industry, by providing comprehensive public explanations for regulatory decisions, and by easing the requirements for participation in the regulatory process. The Sidak report criticizes the first three proposals, but does not discuss the fourth.

Sidak argues (pp. 3-5) that the OECD report goes off track because it reflects a lack of understanding of the concept of market power, leading it wrongly to conclude that the Mexican telecommunications market is not competitive. Sidak criticizes the OECD for adopting the “significant market power” (SMP) approach of the European Commission in determining whether

the industry is competitive. The essence of the criticism is that it infers the presence of market power from the extent of concentration in the industry. According to Sidak, the use of concentration measures to characterize the extent of competition in the market “is not a ‘best practice’ as a matter of sound economic analysis” (p. 4). Sidak states that the OECD’s error is that it assumes, rather than proves, that fixed line and mobile telephone services are sold in separate relevant markets and that a firm with a market share that exceeds 50 percent in either market has market power. The first complaint is gratuitous because Telmex and Telcel together account for more than 75 percent of total access lines. Whether fixed and mobile access are in the same market is irrelevant to the conclusion that Telmex/Telcel possesses significant market power. Thus Sidak’s criticism boils down to using market share as an indicator of market power.

The Sidak report complains that the OECD relied on the market shares of Telmex and Telcel in arguing that the industry was not competitive, but it does not offer any analysis indicating that, indeed, the industry is competitive. While Sidak does not describe best practice in determining whether a firm has market power, presumably it is to examine the performance of the industry: whether the relationships between price and measures of cost reveal a persistently high Lerner Index and excess profit for the leading firm and whether the largest firm has the ability to exclude or disadvantage efficient competitors.

Competition authorities in nearly all countries use market concentration as an indicator of market power, and the OECD and the European Commission also use other indicators. As discussed above, the OECD report assesses the performance of the industry and finds that prices are high, output is low, and quality is inferior, but observes that despite poor performance, the dominant carrier in each segment, Telmex and Telcel, is not losing market share. From this observation, the OECD report concludes that the dominant carrier enjoys enduring market power

that is not being eroded by competition or effectively limited by regulation.

By comparison, the Sidak report contains almost no discussion of the actual performance of Mexico's telecommunications industry. Performance is discussed in one paragraph (p. 12) in which low penetration is attributed to low demand, arising in part from low computer ownership and the lack of Spanish-language content on the Internet. As explained above, because these factors are present in peer nations with better performance, Sidak's argument cannot be correct. Because the OECD report contains extensive analysis of performance, the OECD report comes much closer than the Sidak report to a best-practice analysis of the presence of market power that harms the competitive process and thereby harms consumers.

The main theme of the Sidak report is that the OECD's proposals would "dismantle Mexico's existing legal and regulatory institutions" in pursuit of regulatory policies that would "reduce competition, retard innovation, and harm consumers" (p. 1). Because Sidak assumes that the market is competitive, proposals to strengthen regulation can only cause the performance of the industry to decline. Sidak asserts (p. 31) that the OECD's proposed reforms would create a "government-sanctioned cartel of telecommunications providers in Mexico" that would "protect inefficient competitors and reduce the investment incentives of both incumbents and entrants." This assessment would have merit if the OECD were proposing to impose more regulation on a competitive industry.

Sidak's criticisms of the OECD report also are criticisms of telecommunications regulation throughout the OECD. The essence of Sidak's argument is that Mexico's system of telecommunications regulation is *better* than the policies and governance institutions in most OECD countries. According to Sidak (p. 3), the recommendations OECD report are "a wish list of the worst ideas ever conceived by regulators in the Euro-tilted OECD countries."

The details of telecommunications regulation are hotly contested in just about all nations. Most likely no nation has adopted perfect regulation and one can have a vigorous debate about whether any nation has adopted even a good portfolio of regulatory policies. But the idea that Mexico's regulatory system is superior to the systems in the "Euro-tilted OECD countries" is without foundation. Many scholars have attempted to create indicators for comparing the quality of telecommunications regulation among countries. For example, Waverman and Koutroumpis (2011), who cite several prior studies, offer an index of the effectiveness of telecommunications regulators, and Mexican telecommunications regulation ranks 101st out of the 142 nations they studied. Mexico ranks below the other developing countries in the OECD (Chile is 29th and Turkey is 54th) and 22nd in Latin America, above only Haiti and Bolivia and just below El Salvador and Paraguay. These results are not unique. I am aware of no independent study that gives Mexico even a mediocre grade on the quality of its telecommunications regulatory system. Thus, the notion that the OECD has made a crucial error in suggesting that regulatory institutions are more effective in Europe than in Mexico is not credible.

Sidak's opposition to some of the regulatory proposals in the OECD report is not outside the bounds of reasonable argument. Sidak is correct to argue that the case for mandatory unbundling and structural separation of monopoly from competitive services is costly and in some cases has not produced a beneficial effect on competition. In the U.S., unbundling of the local loop has had a minimal effect in promoting competition from carriers that build some but not all of a local network, although a plausible reason is that incumbent fixed line carriers intensely resisted this policy. If the U.S. regulatory system is too weak to make unbundling work, then it is reasonable to argue that the proposal will not be effective in Mexico.

Nevertheless, if unbundling and separations cannot be effectively implemented in Mexico,

the case for asymmetric regulation of interconnection to the incumbent's network is stronger. The Sidak report argues that bilateral negotiation is superior to regulation for establishing interconnection arrangements and prices. According to Sidak (pp. 5-6), the OECD report "provides no empirical evidence of market failure resulting from bilateral negotiations. Instead, ... the OECD cites two theoretical works... and one irrelevant empirical article... Theoretical arguments alone, however, cannot prove the conjecture."¹⁰

The theoretical arguments that Sidak dismisses, as discussed above, are that each carrier has a monopoly on termination prices that cannot be undone by negotiation, that negotiation may lead to collusion, that higher termination rates will be partly offset by lower monthly access charges as carriers compete for the position as a termination monopolist for each customer, and that as long as carriers have some market power, the effect of negotiated rates is to increase carrier profits. In any case, negotiated rates harm consumers by distorting the relationships between prices and marginal costs among all services. There simply is no reason to believe that this argument was less accurate in 2012 than in 2000.

Sidak dismisses an empirical study by Genakos and Valetti because it deals with the "waterbed effect," which is the theoretical prediction of a negative correlation between termination prices and access prices. Because a test for the waterbed effect involves a test for whether termination prices are higher with negotiation than with regulation (as well as whether negotiation leads to lower prices for access), this reason to dismiss the study makes no sense. Genakos and

10. The theoretical works include the highly influential book by Laffont and Tirole (2000), which Sidak dismisses because "Laffont and Tirole, writing in 2000, had no way of knowing conditions in 2012" (p. 6). Sidak does not explain how conditions underpinning bilateral access negotiations have changed materially since 2000 or why the theoretical argument put forth in this book is obsolete. In fact, this book is one of the most widely cited works on telecommunications policy with over 1200

Valetti (2012) recently published a review of the theoretical and empirical literature on the effects of regulation versus negotiation of termination prices. They conclude that the evidence is strong that regulation lowers termination rates and improves consumer welfare for fixed line customers. For mobile carriers, the evidence is strong that regulation lowers termination prices and raises monthly access prices, but only weakly confirms that profits are lower for mobile carriers under regulation. They attribute the last result to noisy data on mobile services and differences among nations in the intensity of mobile competition and the quality of regulation. They conclude that because interconnection always is imperfectly competitive, properly implemented regulation can improve welfare for mobile customers as well as fixed line customers, but poorly implemented regulation may not benefit customers.

The only relevant dispute in the research literature is about whether regulation is effective in protecting consumers against monopoly power in termination. As discussed above, the problem of monopoly prices for termination arises from the creation of a two-sided market by adoption of calling party pays, rather than bill and keep with mandatory interconnection between carriers. Requiring interconnection, especially when backed by the threat of serious fines for repeated noncompliance, is an easier task for regulators than determining the “right” cost-based price for termination.

The Sidak report argues that the OECD’s proposals for reform of judicial review are a threat to the constitutional rights of regulated firms and that “regulatory decisions should be suspended while courts decide to overturn or affirm those decisions” (p. 27). Sidak is a lawyer and I am not, but regardless I believe that he mischaracterizes the law in Mexico and other OECD

citations on Google Scholar, 45 of which have occurred in the last year.

countries. Sidak argues that the Mexican amparo system is analogous to the right of private parties to petition the government. This statement is a *non sequitur* – the right to petition is not the right to force a court to suspend a decision unless and until the regulator proves to a judge that its decision is lawful. Sidak then draws an analogy between granting an amparo and determining whether a legal complaint is a sham. According to Sidak (p. 28), amparos are granted if the claim by the carrier is not frivolous. But in other countries this standard is relevant to determining whether a complaint should be dismissed, but not to the decision to issue an injunction to prevent a regulation from going into effect before the court assesses its validity.

Sidak equates the proposal to weaken the ability of the courts to grant a preliminary injunction while a regulation is being appealed to abandoning judicial review. According to Sidak (p. 2), the OECD’s proposals would give Cofetel “absolute and unquestioned authority over the telecommunications sector.” This statement does not accurately describe the OECD’s discussion and recommendation about amparos. The OECD report observes that Mexico has the lowest standard for granting injunctions against regulation among all OECD members and that as a result a far greater proportion of regulations are mooted by time or overturned by the courts. Based on this observation, the OECD report proposes to reform judicial review, not to abandon it. According to the OECD (p. 122):

“Regulatory decisions *should* be subject to judicial review... The problem lies in the fact that appeals lead to a suspension of the regulatory action. Appeals that freeze, or delay, regulatory decisions undermine the timeliness and legal certainty that is vital in a regulated market. Mexico has a surprisingly high number of court appeals that result not only in suspension, but also in the overturning of application of a regulatory decision... Important regulatory decisions are subject to judicial review in every OECD country, but it is rare that such decisions are suspended as a matter of course... The current legal system, together with the frequent use of amparos, is arguably the main factor in preventing the application of regulation in Mexico.”

The OECD's analysis is consistent with independent scholarship on the role of judicial review of telecommunications regulation in Mexico. Amparos are regarded as a serious impediment to implementing regulation in a variety of Mexican industries (see Lajous, p. 407, for a discussion of amparos in the energy sector).

Sidak also criticizes the OECD's proposals to eliminate overlapping responsibilities between Cofotel and both Cofeco and the SCT. Sidak's reasons for keeping Cofeco as a gatekeeper to regulating a dominant carrier are that the proposal gives too much power to Cofotel and, in any case, Cofotel lacks competence to undertake competition policy analysis. Sidak's reasons for maintaining the SCT's role in telecommunications regulation is similar: the proposal gives Cofotel too much power and eliminates accountability for its decisions. These arguments are tautological – giving more authority to Cofotel is said to be bad because giving it more authority is bad and because Cofotel lacks experience in exercising this authority.

The Sidak report does not discuss the reasons that the OECD gave for these proposals: to make the regulatory process faster, more certain and more independent of political influence. As stated in the OECD report, a complex regulatory process with multiple veto points for regulatory proposals is advantageous to incumbents because it delays implementation of regulations that reduce their dominance by constraining their ability to set monopoly prices or removing barriers to effective competition by newer entrants.

The OECD's proposals do not eliminate the accountability of Cofotel. Regulatory decisions still would be subject to judicial review and could be overridden by changes in the law. The consensus among scholars who study the structure and processes of regulatory systems, which is summarized in Noll (2000) and applied to Mexico in the World Bank (2003) and OECD studies (1999, 2012a), is that the benefits of streamlined, independent regulation outweigh the costs. Sidak

offers no analysis to refute this consensus.

Sidak recommends (p. 31) “removing regulatory barriers to entry in television and mobile markets,” which also is proposed by the OECD. Sidak does not identify existing regulations that create barriers to entry in mobile services, but opposes regulations that would limit the acquisition of more spectrum by Telmex’s wireless affiliate, Telcel (pp. 17-19). The underlying issue here is whether market allocation of spectrum rights should have a competition review procedure that is analogous to the review of mergers among competing firms.

Spectrum rights are an essential input to providing mobile services. If spectrum is sufficiently scarce that it commands a high price, which is the normal outcome in spectrum auctions even in developing countries, the concentration of ownership of spectrum is a good proxy for concentration in the market. Moreover, because spectrum is essential for offering wireless services, spectrum scarcity constitutes a barrier to entry, in which case market concentration is a reasonable indicator of market power. Thus, a serious danger in a spectrum auction is that an incumbent with a high market share will pay the discounted present value of the monopoly rents available from acquiring all available spectrum. While this bidding process transfers most if not all of the monopoly profits from the carrier to the government, the outcome still is harmful to consumers because it leads to higher prices and lower output.

The arguments for tolerating monopolization of wireless telecommunications are, first, that monopoly is more efficient because it can capture economies of scale and scope, and second, that the inefficiency from monopoly pricing can be eliminated by regulation. In the U.S. this argument was made by AT&T in defending its proposal to acquire T-Mobile in 2011, both of which were among the four national wireless carriers. Neither the FCC nor the U.S. Department of Justice found the evidence to be convincing in support of the proposition that wireless communications has

substantial economies of scale and scope, so both agencies opposed the merger and the carriers abandoned their plan. Thus, a decision by a regulator to disallow concentration in spectrum ownership is not unreasonable.

The Sidak report does discuss restrictions on the ability of Telmex to offer television services (pp. 21-25), and concludes that prohibiting such entry harms consumers and strips Telmex of the Constitutional right of freedom of expression. Because the OECD report agrees that Telmex should be permitted into multichannel program distribution, Sidak's disagreement is with the proviso that entry should occur only after Telmex is subject to asymmetric regulation as a dominant carrier in telecommunications.

An alternative to the OECD's proposal is to allow cable television companies to enter the telecommunications business before Telmex is allowed to enter video program distribution. In areas where cable is extensively deployed, cable companies could limit the ability of Telmex to leverage its market position in telecommunications into an inefficiently large share of the cable television market by if they could offer a "triple option" (fixed line telephone, cable television, and Internet access). Such a policy also would give Cofetel a reasonable benchmark for regulating the entry of Telmex into television in areas where cable is not present and Telmex would be a monopolist in all three services.

V. CONCLUSIONS

The OECD report presents a reasonably good, if incompletely documented, assessment of the state of telecommunications in Mexico. Its conclusion that Mexico has relatively poor performance compared to reasonably achievable results is beyond dispute. Likewise, the OECD's assessment that Mexican regulatory policy is ineffective also is beyond dispute. Only at the level of

detailed policy recommendations does Telmex have reasonable disagreements with the OECD. But Telmax has squandered the opportunity to make constructive alternative policy recommendations by sponsoring reports that are simply over the top in terms of the scope and stridency of their criticisms of the OECD.

The most important recommendations by the OECD pertain to using regulation to intensify competition. An example is to end monopoly pricing of termination. Best would be to adopt bill and keep, but price regulation is a reasonable substitute. The latter option could take the form of either cost-based prices or the simpler, less effective requirement to ban a difference between on-network and off-network termination charges. Another example is to abandon detailed specification of service requirements and limitations in concessions and to switch to a type-licensing system. This change would allow telecommunications carriers and cable television companies to engage in more extensive direct services competition.

The take-home lessons for Mexico are that Telmex remains a near monopoly that is mostly unregulated and that the structure and process of regulation must be changed if the performance of the sector is to be substantially improved. Due to Telmex's monopoly and ineffective regulation, Mexico is falling further behind peer countries in telecommunications, especially broadband services. While one can quibble with some of the details of the OECD report, its analysis and policy recommendations are reasonable and ought to be taken seriously.

**Table 1A: Income Data among Nations
Examined by Hausman and Rios, 2011**

Country^a	Per Capita \$GDP^b	Population (millions)	Gini Index^c
<i>Mexico</i>	15,266	114.8	51.7
<i>Argentina</i>	17,554	40.8	45.8
<i>Brazil</i>	11,640	196.7	51.9
<i>Chile</i>	17,310	17.3	52.1
<i>Columbia</i>	10,033	46.9	56.0
Czech Republic	26,208	10.5	31.0
Greece	25,850	11.3	33.0
Hungary	21,663	10.0	24.7
Israel	27,825	7.7	39.2
Korea	30,286	49.8	31.0
Malaysia	16,051	28.9	46.2
<i>Peru</i>	10,234	29.4	46.0
Poland	21,261	38.2	34.2
Portugal	25,372	10.6	38.5
Russia	21,246	141.9	42.0
South Africa	10,960	50.6	65.0
Turkey	17,110	73.6	40.2

a. Nations in italics are located in Latin America.

b. Hausman and Ros also report GDP valued at market exchange rates (MER). The importance of using PPP or MER is discussed elsewhere in this article.

c. Gini coefficients are for the year nearest 2011 for which data are available, usually within the previous few years. Because the Gini coefficient changes slowly, data from recent years are reliable indicators for 2011.

Sources: GDP – World Bank, “GDP Per Capita, PPP (Current International \$),” last accessed February 11, 2013, at <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>, and Gini – U.S. Central Intelligence Agency, *World Fact Book*, last accessed on February 11, 2013 at www.cia.gov/library/publications/the-world-factbook/.

Table 1B: Income Data for All Other Nations with Per Capita GDP between \$10,000 and \$20,000 (PPP), 2011^a

Country	Per Capita \$GDP	Population (millions)	Gini Index
<i>Mexico</i>	15,266	114.8	51.7
Azerbaijan	10,067	9.2	33.7
Belarus	14,938	9.5	27.2
Botswana	14,746	2.0	63.0 ^b
Bulgaria	14,825	7.5	45.3
<i>Costa Rica</i>	12,157	4.7	50.3
Croatia	19,469	4.4	32.0
Gabon	15,852	1.5	na
Kazakhstan	13,099	16.6	26.7
Latvia	17,569	2.2	35.2
Lebanon	14,609	4.3	na
Macedonia	11,258	2.1	44.2
Mauritius	14,420	1.3	39.0
Montenegro	13,432	0.6	24.3
<i>Panama</i>	15,589	3.6	51.9
Romania	15,139	21.4	33.3
Serbia	11,883	7.3	28.2
<i>Uruguay</i>	15,078	3.4	45.3
<i>Venezuela</i>	12,749	29.3	39.0

a. Excluded are seven small island states within this income range: Antigua and Barbuda, Dominica, Grenada, Palau, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines. All have populations of less than 200,000.

b. For Botswana, the Gini coefficient is from 1993 and so is less reliable as an estimate for 2011.

Sources: Same as Table 1A.

Table 1C: Income Data for Latin American Nations with Per Capita GDP (PPP) between \$4,000 and \$10,000, 2011

Index	Country	Per Capta \$GDP	Population (millions)	Gini
	<i>Mexico</i>	15,266	114.8	51.7
	<i>Bolivia</i>	5,099	10.1	58.2
	<i>Dominican Rep.</i>	9,796	10.1	48.4
	<i>Ecuador</i>	8,669	14.7	47.3
	<i>El Salvador</i>	6,831	6.2	46.9
	<i>Guatamala</i>	4,928	14.8	55.1
	<i>Honduras</i>	4,047	7.8	57.7
	<i>Paraguay</i>	5,501	6.6	53.2

Sources: Same as Table 1A.

Table 2A: Telecommunications Performance Indicators: Peer Nations, 2011

Country	Per Capita \$GDP	Fixed Lines Per 1000	Mobile Subs Per 100	Fixed Bband Subs Per 100	Internet Users Per 100
<i>Columbia</i>	10,033	15	98	6.9	40.4
Azerbaijan	10,067	18	109	10.7	50.8
<i>Peru</i>	10,234	11	110	3.5	36.5
South Africa	10,960	8	127	1.8	20.9
Macedonia	11,258	20	109	13.2	56.7
<i>Brazil</i>	11,640	22	123	8.6	45.0
Serbia	11,883	37	125	10.8	47.2
<i>Costa Rica</i>	12,157	32	92	8.7	42.1
<i>Venezuela</i>	12,749	25	98	0.9	40.4
Kazakhstan	13,099	26	143	7.5	44.0
Mauritius	14,420	29	99	8.9	35.5
Montenegro	14,432	27 ^a	185 ^a	8.3 ^a	40.0
Lebanon	14,609	21	79	5.2	52.0
Botswana	14,746	7	143	0.8	7.0
Bulgaria	14,825	31	141	15.5	50.8
Belarus	14,938	44	141	21.9	40.0
<i>Uruguay</i>	15,078	29	141	13.5	51.6
Romania	15,139	22	109	15.4	44.1
<i>Mexico</i>	15,266	17	82	10.6	36.2
<i>Panama</i>	15,589	15	204	7.9	42.7
Gabon	15,832	2	117	0.3	8.0
Malaysia	16,051	15	127	7.4	61.0
Turkey	17,110	21	89	10.3	42.1
<i>Chile</i>	17,310	19	130	11.7	53.9
<i>Argentina</i>	17,554	25	135	10.5	47.7
Latvia	17,569	23	103	20.4	72.4
Croatia	19,469	40	116	19.5	70.5
Median	14,746	22	117	8.9	44.0
Mean	13,860	22	121	9.3	43.5

a. Data for 2010; 2011 data not reported.

Source: World Bank Indicators, at <http://data.worldbank.org/indicator/all>, last accessed February 11, 2013.

**Table 2B: Telecommunications Performance Indicators:
Latin American Nations, 2011**

Country	Per Capita \$GDP	Fixed Lines Per 1000	Mobile Subs Per 100	Fixed Bband Subs Per 100	Internet Users Per 100
<i>Honduras</i>	4,047	8	104	0.0	15.9
<i>Guatamala</i>	4,928	11	140	1.8	11.7
<i>Bolivia</i>	5,099	9	83	0.7	30.0
<i>Paraguay</i>	5,501	6	99	1.0	23.9
<i>El Salvador</i>	6,831	15	126	3.3	17.7
<i>Ecuador</i>	8,669	15	105	4.2	31.4
<i>Dominican Rep.</i>	9,796	10	87	4.0	35.5
<i>Columbia</i>	10,033	15	98	6.9	40.4
<i>Peru</i>	10,234	11	110	3.5	36.5
<i>Brazil</i>	11,640	22	123	8.6	45.0
<i>Costa Rica</i>	12,157	32	92	8.7	42.1
<i>Venezuela</i>	12,749	25	98	0.9	40.4
<i>Uruguay</i>	15,078	29	141	13.5	51.6
<i>Mexico</i>	15,266	17	82	10.6	36.2
<i>Panama</i>	15,589	15	204	7.9	42.7
<i>Chile</i>	17,310	19	130	11.7	53.9
<i>Argentina</i>	17,554	25	135	10.5	47.7

Source: World Bank Indicators, at <http://data.worldbank.org/indicator/all>, last accessed February 11, 2013.

Table 3: Fixed Line Telecommunications Penetration in Eight Richest Latin American Nations, 1991 and 2011

Country ^a	Fixed Line Penetration per 100 Population		
	1991	2011	Change
Brazil	7	22	15
Costa Rica	10	32	22
Venezuela	8	25	17
Uruguay	14	29	25
Mexico	7	17	10
Panama	9	15	6
Chile	8	19	11
Argentina	9	25	17

a. Countries listed is ascending order of 2011 per capita GDP (PPP), as shown in Table 2B.

Source: World Bank Indicators, at <http://data.worldbank.org/indicator/all>, last accessed February 11, 2013.

Table 4: Internet Use for Latin America, 2010

Country	International Internet Use per Internet User (bits/s)
Columbia	10,245
Peru	8,487
Brazil	12,619
Costa Rica	12,686
Venezuela	6,772
Uruguay	22,988
Mexico	7,316
Panama	21,278
Chile	19,140
Argentina	27,494
All Latin American	11,948

Source: International Telecommunications Union and World Bank, *The Little Data Book on Information and Communication Technology 2012*, World Bank, 2012, last accessed February 11, 2013, at http://www.itu.int/ITU-D/ict/publications/material/LDB_ICT_2012.pdf.

**Table 5: Baskets of Services Used by OECD
In Telecommunications Price Comparison**

Residential Fixed Line	20 calls, 60 calls, 140 calls, 420 calls
Business Fixed Line	100 calls, 250 calls
Post-paid Mobile	30 calls, 100 calls, 300 calls, 900 calls
Prepaid Mobile	40 calls
Broadband	below 2.5 Mbs, between 2.5 and 15 Mbs
Internet Transit	155 Mbs

**Table 6: Ratio of MER to PPP:
Latin America, 2011**

Country	MER/PPP
Argentina	0.6
Brazil	1.1
Chile	0.8
Columbia	0.7
Costa Rica	0.7
Mexico	0.7
Panama	0.5
Peru	0.6
Uruguay	0.9
Venezuela	0.8

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