# Three Best-selling Stories about Telecommunications in Mexico: A Critique of the OECD Review of Telecommunication Policy and Regulation in Mexico

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*by Adriaan ten Kate Sr.\**

## Abstract

According to the Review of Telecommunication Policy and Regulation in Mexico published by the OECD in January 2012, the performance of the Mexican telecommunications industry in terms of prices and penetration has been poor in comparison with other OECD countries. This would have led to a welfare loss to the Mexican economy of 129.2 billion dollars over the 2005-2009 period; ie. 1.8% of national GDP. The poor performance is attributed to a lack of competition in Mexican telecommunication markets. These findings are supported by an econometric study establishing a causal link between the degree of competition and the performance indicators. In this article I criticize the findings of the OECD arguing that in comparison with OECD averages Mexican prices have not been high, that penetration ratios are reasonably acceptable given Mexico's stage of economic development, that they are steadily catching up with OECD standards and, finally, that the econometric study fails to establish a causal link between the degree of competition and performance. Particularly, I show that there is no theoretical justification for comparing prices in purchasing power parity dollars, as the OECD does. Moreover, I indicate a number of elementary errors in the econometric study inflating the welfare loss beyond any proportions.

## Introduction

Recently, the OECD published its "Review of Telecommunication Policy and Regulation in Mexico" (in the following the Review), a report that had been requested by the Mexican government.[1] Its main findings were (i) that prices for telecommunication services are excessively high in Mexico, (ii) that those excessive prices have led to a poor market performance of the industry in terms of penetration ratios and development of infrastructure, and (iii) that from 2005 to 2009 the Mexican economy, as a result of the excessive prices and the consequent poor market performance, has suffered a welfare loss of 129.2 billion US dollars, which is 1.8% of the country's GDP. To make it even more alarming, according to the OECD the situation is getting worse.

The high prices are attributed to a lack of competition in telecommunication markets and to an ineffective regulation. Both the lack of competition and ineffective regulation are connected with the peculiar Mexican injunction system, which would allow the incumbent company to evade regulatory measures or just to gain time. Based on these findings, the report makes a number of recommendations to improve the situation.

The suggestion that prices of telecommunication services are high in Mexico is nothing new. The OECD has stated this ever since its country study of 1998 about regulatory reform in the telecommunication industry in México.[2] Yet, it is no more than a fable. When measured by an appropriate standard, prices in Mexico are not higher than their equivalents in other member countries on average, and as of 2010 Mexican even substantially lower. The false perception that they are high comes from the peculiar way of the OECD to measure prices in so-called USDPPP, ie. US dollars in purchasing power parity. This way of measuring prices inflates Mexican prices across the board by approximately 50% relative to OECD averages. Small wonder Mexican prices result so high. With a curved mirror you can make even the slimmest lady look fat.

In section 1 of this paper I do away with this first story about telecommunications in Mexico, the story of the high prices. I show that Mexican prices, when expressed not in USDPPP but in nominal US dollars, have been quite acceptable ever since 2004, and that more recently (as of 2010) they have even become extremely competitive for the most important services. To show that I use exactly the same data as the data that were used by the OECD to defend the cause that Mexican prices are high. Apart from that, I challenge the view of the OECD that working with USDPPP is more reliable than working with nominal US dollars. Instead, I explain why the PPP methodology is inappropriate for price comparisons across countries at low levels of product aggregation.

The second story on telecommunications in Mexico: that of the poor performance of the industry, is somewhat more robust than the first. Effectively, comparing Mexican penetration ratios with those of other member countries, there is no way to deny that Mexico is lagging behind in most services. Yet, rather than being a result of higher prices – prices are not higher – this lag is due to other factors, such as Mexico's stage of economic development and its lower per-capita income, factors that are hardly taken into account in the Review. It is somewhat unfair to blame a runner

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[1] OECD (2012), *Review of Telecommunication Policy and Regulation in Mexico*.
[2] OECD (1998), *Country Studies: Mexico – Regulatory Reform in the Telecommunications Industry*.

for not being in the front, when he started the race later than the rest of the pack. Moreover, it should be noted that, as regards penetration ratios, Mexico has been steadily catching up with average OECD levels over the last decade, ie. the gap is closing.

In the second section I show that the performance of the Mexican telecommunications industry is far less deplorable than suggested by the OECD. Once more, I use exactly the same data as the OECD used to argue the contrary. This makes clear how easy it is to arrive at completely opposite conclusions from one and the same set of data when viewed from different angles and selections are made for convenience. I leave it to my readers to decide which of the two interpretations is the most realistic.

The third story is that of the welfare loss of 129.2 billion USD (1.8% of GDP).[3] If that story were true, the Mexican telecommunications industry would not have generated any value added at all, if valued at competitive prices. Such an amount of money is quite alarming and more than what the Federal Government has spent on social security and almost half of what it has spent on public education during the period under study. Fortunately, the story is not true.

The estimation of the welfare loss the Mexican economy would have suffered from the presumed lack of competition is based on an econometric study (in the following the Study) that attempts to predict what would have happened if competition in Mexican telecommunication markets had been at par with other member countries. However, the Study suffers from some major mistakes with far reaching consequences.

The most embarrassing mistake is that the Study simply puts a wrong variable in the formula for one of the two components of the welfare loss. I demonstrate that this mistake alone leads to an overestimation of 38 billion USDPPP; ie. more than 60% of that component of the welfare loss, reported at 62 billion, is due to the mistake. The other mistakes are of a different nature and have to do with the way in which the Study interprets the estimated price and demand functions. I explain that this interpretation unduly blames on a lack of competition what in reality is due to completely different factors. After correcting for these mistakes, the welfare loss virtually disappears. That is, even assuming that comparing prices in USDPPP would be correct, a point of view I show to be wrong, there is no such thing as a welfare loss from a lack of competition.

In section 3 I spell out the mistakes of the Study in some detail and recalculate the welfare loss that results after correcting them. I considered it important to do so in  detail in order to avoid this third story from becoming one more bestselling story about telecommunications in Mexico. Until now it has made its way into newspaper headings, but perhaps it is still possible to derail it before it becomes conventional wisdom.

In section 4 I make some critical observations about the econometric study itself. There I draw the attention to the lack of precision of the variables representing the degree of competition and to the fact that their predictive power in the estimated functions is far too low to arrive at such outspoken conclusions about the role of competition as the Review does. I also mention the

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[3] Contrary to what is stated in the Executive summary of the Review this amount is not expressed in USD, but in USDPPP. The percentage of 1.8 is correct.

virtual absence of per capita income as an explanatory variable in most demand functions. This raises the suspicion about the credibility of the exercise even further.

In a final section I set the record straight by summarizing the observations made in the main text and arrive at some additional conclusions about the findings of the Review and the relation between those findings and the subsequent recommendations made by the OECD.[4]


# 1.     The story of the high prices

For a long time the OECD has voiced the idea that prices of telecommunication services are excessively high in Mexico. It did so in its country study of 1998 about regulatory reform in the telecommunications industry in Mexico.[5] It has done so on various occasions in country reviews. It becomes apparent from several publications on pricing trends in telecommunications. And it does so again in the recently published Review. These high prices are usually attributed to a lack of competition in Mexican telecommunication markets and blamed on the incumbent company that, 15 years after the sector was opened up to competition, still holds market shares of 80% and 70% for fixed and mobile telephony respectively. To make it even more alarming, the Review states "[…] forces of competition have worked much better in other countries, such that prices dropped significantly faster in many OECD countries relative to Mexico´s telecommunication prices."[6] That is to say, Mexican prices are not only excessively high in comparison with other OECD countries, but the gap is even widening.

The OECD bases its findings on information elaborated by Teligen, one of the Knowledge Centers of "Strategy Analytics", an intelligence unit which has been measuring telecommunication prices across countries for a long time with a methodology that is continuously reviewed and updated by international experts. Although from time to time irregularities have been found in the figures reported by Teligen for Mexico, and the incumbent company has occasionally collaborated by providing information to correct such irregularities, I do not pretend to criticize Teligen's figures, nor the methodology with which they are elaborated. It is rather the way the OECD interprets the figures where I do not agree and, as I demonstrate below, from the very same figures I arrive at conclusions about prices in Mexico, which are diametrically opposed to those of the OECD.

The problem is that the OECD expresses prices in purchasing-power-parity dollars (USDPPP) before comparing them between countries. This conversion to USDPPP inflates Mexican prices by about 50% relative to other member countries of the OECD. Evidently, inflating Mexican prices to such an extent leads to much higher prices in Mexico than OECD averages. I demonstrate that, when prices are expressed in nominal dollars, most of the services analyzed in the Review have been relatively cheap in Mexico, at least since 2005.

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[4] For an extensive discussion of the regulatory recommendations of the OECD see Gregory Sidak (2012), "The  OECD's Proposal to Cartelize Mexican Telecommunications".
[5] *Supra* note 2.
[6] Review, p. 76.

Why the OECD compares prices in terms of PPP is unclear. It has openly confirmed its preference for PPP price comparisons, but as far as I am aware, it has never come up with a theoretical justification. Comparing prices for individual items in PPP does not compare the prices of the item directly, but rather compares the price of the item in one country with the general price level in that country relative to the price of the item in the other country relative to the general price level in the other country. That is to say, if the price of an item in USDPPP results higher in Mexico than in Norway, it may be that the price is not higher at all, but that it is simply the general price level of all expenditures what makes the difference. Thus, the high telecommunication prices in Mexico may be nothing but the low pricing of other items that compose the basket of expenditures, such as cars, gasoline, domestic services and so on, items that are much cheaper in Mexico than in Norway, but have nothing to do with the telecommunications industry.

In annex 1 I explain in some detail what purchasing power parity is about and what PPP indices are meant for. Among its uses there is no such thing as comparing the prices of individual items across countries. PPP indices are inteded instead to make GDP and per capita income comparable among countries in terms of purchasing power, not value. For that purpose PPP indices act as normal price index numbers. Comparing prices of individual items in USDPPP is an improper use of the PPP methodology.

In order to show the impact of the OECD approach on the price comparisons between Mexico and other OECD countries, I convert the actual prices observed for Mexico and the means (or averages) of the prices observed in other member countries from USDPPP into USD, using the purchasing power parity indices reported on the OECD website.[7] I have done so for the three services analyzed in the Review (fixed and mobile telephony, and broadband services) and have used the data as reported in the Study.

In the following table I present the results of the price comparisons in both USDPPP and nominal USD for the fixed telephony basket from 2000 to 2009.

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[7] These data are available under the heading Statistics at the official OECD site www.oecd.org/home.

**Table 1.1  Price comparisons for the fixed telephony basket in USDPPP and USD***

| | USDPPP | | | USD | | |
|------|--------|--------------|-------------------|--------|--------------|-------------------|
| | Mexico | OECD mean | difference | Mexico | OECD mean | difference |
| 2000 | 1075 | 609 | expensive (77%) | 693 | 442 | expensive (57%) |
| 2001 | 995 | 609 | expensive (63%) | 672 | 423 | expensive (59%) |
| 2002 | 1025 | 645 | expensive (59%) | 696 | 468 | expensive (49%) |
| 2003 | 923 | 622 | expensive (48%) | 583 | 527 | expensive (11%) |
| 2004 | 932 | 629 | expensive (48%) | 596 | 581 | expensive (3%) |
| 2005 | 932 | 601 | expensive (55%) | 609 | 572 | expensive (7%) |
| 2006 | 1024 | 679 | expensive (51%) | 675 | 640 | expensive (6%) |
| 2007 | 825 | 663 | expensive (24%) | 557 | 679 | cheaper (-18%) |
| 2008 | 970 | 619 | expensive (57%) | 651 | 656 | cheaper (-1%) |
| 2009 | 510 | 603 | cheaper (-15%) | 290 | 584 | cheaper (-50%) |

* The data in USDPPP are taken from table 33 on page 37 of the Study; the conversion to USD was performed with the PPP indices of table 1 of Annex 1.

From the table it becomes clear that, when measured in USDPPP, Mexican prices for the fixed telephony basket were indeed higher than OECD means. Only in 2009 the price was lower.[8] Measured in nominal USD, however, Mexican prices started off at very high levels, but since 2003 they have been rather close to OECD means and from 2007 even substantially lower. There is definitely a declining trend, however. Both in USDPPP and in USD Mexican prices are gradually getting closer to prices in other member countries.

The Study does not go beyond 2009, but from the Communications Outlook of 2011 it appears that in August 2010 all 6 baskets for fixed telephony services were more expensive in Mexico than in the OECD by a simple average of 47% when measured in USDPPP. When measured instead in nominal USD, 4 out of the 6 baskets were cheaper by a simple average for all the baskets of –6%.[9] Similar information is reported by the Review for February 2011: in USDPPP 6 baskets are more expensive than in the OECD by 44%.[10] No comparisons are provided in USD, but assuming a comparative PPP index for Mexico of 1.58, as results from preliminary estimates by the OECD for that year, 5 of those 6 baskets were cheaper in Mexico than OECD averages.

The same exercise for the mobile telephony basket of the Study delivers the results of table 1.2.

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[8] One may wonder how it is possible that a price declines from one year to another by almost 50% without any noticeable changes in tariffs. The Study mentions the possibility of a measurement mistake (page 46), but it is by far not the only erratic jump or fall in prices observed in the Study. Usually such sudden changes obey redefinitions by Teligen of baskets, which have a differential impact in different countries. The Study frivolously concludes from such a fall in price that it was feasible to have lowered the price earlier. So if prices are high, they are high, and if they become low, they could have been lowered earlier. One might also conclude that the redefinition of the basket should have been done earlier.
[9] OECD Communications Outlook, 2011, preliminary version.
[10] Review, table 1.7, p. 32

**Table 1.2  Price comparisons for the mobile telephony basket in USDPPP and USD\***

|      | USDPPP | | | USD | | |
|------|--------|------------|----------------|--------|--------------|----------------|
|      | Mexico | OECD mean  | difference     | Mexico | OECD Mean    | difference     |
| 2000 | 578    | 365        | expensive (58%) | 373   | 265          | expensive (41%) |
| 2001 | 471    | 324        | expensive (45%) | 318   | 225          | expensive (41%) |
| 2002 | 851    | 618        | expensive (38%) | 578   | 448          | expensive (29%) |
| 2003 | 720    | 577        | expensive (25%) | 455   | 489          | cheaper  (-7%) |
| 2004 | 615    | 575        | expensive  (7%) | 393   | 531          | cheaper (-26%) |
| 2005 | 610    | 514        | expensive (19%) | 399   | 489          | cheaper (-18%) |
| 2006 | 490    | 419        | expensive (17%) | 323   | 395          | cheaper (-18%) |
| 2007 | 475    | 393        | expensive (21%) | 321   | 402          | cheaper (-20%) |
| 2008 | 464    | 447        | expensive  (4%) | 311   | 473          | cheaper (-34%) |
| 2009 | 402    | 309        | expensive (30%) | 228   | 299          | cheaper (-24%) |

\* The data in USDPPP are taken from table 46 on page 50 of the Study; the conversion to USD was performed with the PPP indices of Annex 1.

The story told by this table about mobile services is very similar to that of table 1.1 for fixed telephony. When measured in USDPPP, prices in Mexico for the mobile basket were higher than OECD means throughout the period, although to a declining degree. When prices are measured instead in nominal USD, Mexican prices have been lower than OECD means since 2003 and to an increasing extent. That is, measuring prices in PPP dollars creates the false perception that prices are higher in Mexico. But even measuring them in USDPPP the situation is not getting worse, as the OECD suggests in the Review, but better.

Again, the Study does not report data beyond 2009, but in the Communications Outlook for 2011 the prices for 6 baskets of mobile services are compared for August 2010. When measured in USDPPP 5 of the 6 baskets are more expensive in Mexico than average OECD prices by 6% (simple average), but when measured in USD all baskets are cheaper in Mexico by a simple average of –32%. For February 2011 the Review reports information on 5 baskets in USDPPP: 3 of them more expensive in Mexico than in the OECD, two of them cheaper, all of them together more expensive by a simple average of 20%. Converting those comparisons to nominal USD with the preliminary estimate of the PPP index for 2011 only one basket remains 5% more expensive, while the other 4 become substantially cheaper in Mexico.

Finally, I did the price comparison exercise for broadband services. Results are presented in table 1.3. Following the Study, only data for 2005 to 2009 are reported and in this case OECD figures are averages, no means.

**Table 1.3  Price comparisons for broadband services in USDPPP and USD***

| | USDPPP | | | USD | | |
|---|---|---|---|---|---|---|
| | Mexico | OECD average | difference | Mexico | OECD average | difference |
| | | | | | | |
| 2005 | 1251 | 1024 | expensive (22%) | 818 | 974 | cheaper (-16%) |
| 2006 | 637 | 767 | cheaper (-17%) | 420 | 723 | cheaper (-42%) |
| 2007 | 608 | 608 | at par      (0%) | 410 | 623 | cheaper (-34%) |
| 2008 | 836 | 569 | expensive (47%) | 561 | 602 | cheaper (-7%) |
| 2009 | 576 | 542 | expensive (6%) | 327 | 525 | cheaper (-38 %) |

* The data in USDPPP are taken from table 60 on page 62 of the Study; the conversion to USD was performed with the PPP indices of Annex 1.

Once more, the story is very similar. When measured in USDPPP, Mexican broadband prices were generally higher than OECD averages, but measured in nominal USD, they were substantially lower.

So far, only services to end users (retail services) were considered and the econometric study is indeed confined to that kind of services. However, particularly from a point of view of promoting competition, it is also important to consider interconnection rates (network services). Without a doubt the most important interconnection rates are those of call termination in fixed and mobile networks. As regards mobile termination rates, the OECD recently reported rates for Mexico (in USD) at about half the OECD average for May 2011.[11] With respect to termination rates in fixed networks, the actual rate (as of March 2012) agreed among operators is at 0.975 dollar cents per minute, which is slightly below the OECD average in USD.[12]

It is, however, interesting to mention what has really happened with the agreed fixed termination rate of 0.975 dollar cents. This rate has been in force since 2002, but has been subject to several disagreements in the course of time. The last one was "used" in May 2011 by the, according to the Review, hamstrung regulator imposing a rate of 0.318 dollar cents per minute, which brought it at a level far below the OECD average and even below the lowest rate of all member countries. On that occasion the incumbent company, again according to the Review, "abused" of the Mexican injunction system challenging the decreed rate at less than a third of the OECD average. The result is that at present the incumbent company is billing the agreed rate, but the new operators are paying the decreed rate. Ie., the effective fixed termination rate is at less than one third of the OECD average.

In summary, I arrive at the following conclusions. (i) Comparing prices in USDPPP, as the OECD does, is inappropriate. It does not only imply a price comparison of the item at stake but also a comparison of general price levels. For very cheap countries like Mexico the latter component is more important than the first. (ii) The finding that Mexican prices are high is a "*fata morgana*" and

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[11] OECD, Developments in Mobile Termination, 28-02-2011.
[12] OVUM interconnect, London, UK.

hinges upon the way these prices are measured. In nominal USD Mexican prices are lower than OECD averages and even increasingly so. (iii) Effective interconnection rates in Mexico, particularly important to promote competition in retail markets, are substantially below OECD averages. (iv) The assertion of the OECD that prices in other countries are falling more sharply than in Mexico is at odds with the data of its own Study. According to that data Mexican prices have declined more rapidly than OECD means or averages for all three services considered in the Study.

## 2.     The story of the poor performance

The second bestselling story of the telecommunications industry in Mexico is that of its poor performance. According to the Review, excessive prices, attributed to a lack of competition, have led to low penetration ratios for both fixed and mobile services, and broadband access. This story is somewhat more robust than that of the excessive prices, as the penetration ratios reported for Mexico are indeed significantly below OECD averages. Such penetration ratios are relatively hard figures and more reliable than the prices of baskets of services, whose composition may differ widely between countries, operators and over time.

As explained in the previous section, Mexican prices have not been excessive, at least not since 2005. Consequently, if penetration ratios are low, which seems indeed to be the case, this cannot be due to higher prices, at least not to higher prices in the period at stake. They might be due to higher prices before 2005, but if they were, this is hardly accounted for by the Study. In fixed telephony, for example, the demand function of the Study is static. That is, the penetration ratio depends on population characteristics and price in the period itself, not on what happened the year before.

That is perhaps the greatest shortcoming of the Study: that there is no recognition of the fact that penetration ratios cannot change overnight. It takes time to increase them; it requires investment in infrastructure. Ie., it is not only factors on the demand side that influence them, but also, and even more so, supply-related factors. Perhaps the most important determinant of the penetration ratio in a certain year is the penetration ratio the year before.

One can simply not expect that, if at a certain point of time the number of subscriptions is 12.33 million, as it was for fixed telephony in Mexico in 2000, by just changing the actual price to a competitive price, the number of subscriptions would jump overnight to 42.35 million, which in terms of penetration ratios is close to the OECD average. That would be crazy but is exactly what the Study is suggesting. If then the number of subscriptions goes up to 19.87 million in a period of 7 years, the gap is still enormous in spite of a compound annual growth rate of 7%.

In fact, in the analysis of the Review there is hardly any recognition of the fact that Mexico is at an earlier stage of development than most other OECD countries and that its per capita income is the lowest of all member countries. Evaluating then Mexico's performance by holding its penetration ratios against those of the other members is like imposing the final exam on a student who is only

half way. Any proper evaluation of Mexico's performance should not only take account of relative positions but also of how these relative positions change over time.

In the following I show that, as regards penetration ratios, Mexico has steadily been catching up with other member countries since the beginning of the century for all three services. In spite of the fact that this follows immediately from the hard data reported in the Study, the Review is almost silent about it. This steadily catching up sheds quite a different light on the performance of the telecommunications industry in Mexico from that of the diagnosis of the Review.

In the following table I compare penetration ratios for fixed telephony services between Mexico and OECD averages from 2000 to 2009.

**Table 2.1  Penetration ratios – fixed telephony\***

|      | Penetration Mexico (per 100 inhabitants) | OECD average (per 100 inhabitants) | Mexico/OECD (%) |
|------|------------------------------------------|------------------------------------|-----------------|
| 2000 | 13 | 47 | 28 |
| 2001 | 14 | 46 | 30 |
| 2002 | 15 | 45 | 33 |
| 2003 | 16 | 44 | 36 |
| 2004 | 18 | 43 | 42 |
| 2005 | 19 | 43 | 44 |
| 2006 | 19 | 41 | 46 |
| 2007 | 19 | 40 | 48 |
| 2008 | 19 | 38 | 50 |
| 2009 | 18 | 35 | 51 |

\* Data are taken from table 36, page 39 of the Study.

From the table it becomes clear that Mexican penetration ratios have increased from 2000 to 2005, then came to a standstill and slightly decreased in the last year. This is hardly a setback, but should be considered in the light of the worldwide trend of decreasing importance of fixed telephony. Evidently, it is not clear whether this declining trend will continue in the future and where it will end, but urging Mexico now to increase its penetration rates in fixed telephony is like betting on a horse you know in advance is not going to win the race.

In the last column of the table I compare Mexican penetration ratios with the averages of the OECD. It appears that Mexico is steadily catching up and that, if present trends persist, Mexican penetration ratios will remain at roughly the same level, but OECD averages will come close to that level somewhere in between 2015 and 2020.

In table 2.2 I present the evolution of penetration ratios in Mexico and the OECD for mobile telephony services.

**Table 2.2  Penetration ratios – mobile telephony***

|  | Penetration Mexico (per 100 inhabitants) | OECD average (per 100 inhabitants) | Mexico/OECD (%) |
|---|---|---|---|
| 2000 | 14 | 54 | 26 |
| 2001 | 22 | 65 | 33 |
| 2002 | 26 | 72 | 36 |
| 2003 | 30 | 78 | 38 |
| 2004 | 37 | 86 | 43 |
| 2005 | 45 | 94 | 48 |
| 2006 | 53 | 100 | 53 |
| 2007 | 63 | 108 | 58 |
| 2008 | 71 | 114 | 62 |
| 2009 | 78 | 121 | 64 |

* Data are taken from table 48, page 50 of the Study.

Table 2.2 tells us that Mexican penetration ratios in mobile telephony went up from 14 per 100 inhabitants in 2000 to 78 in 2009, whereas average penetration ratios in the OECD increased from 54 to 121 over the same period. That is, Mexican ratios almost quintupled while OECD ratios only just more than doubled. Evidently, this difference in growth has to do with the fact that in many countries ratios are already close to saturation, but general speaking one may say that Mexico's penetration ratios are 6 years behind OECD averages, not such a bad record if one realizes that it will probably take at least two decades before catching up in per capita income, if at all.

In the last column of the table the penetration ratios for Mexico are compared with the average penetration ratios for the OECD. Here, we observe an even more spectacular progress than for fixed telephony. In 2000 Mexico's penetration ratio was at 26% of the OECD average; in 2009 it was at 64%. Yet the perspectives for the evolution of mobile telephony seem to be much brighter than for fixed telephony, because a good deal of voice, instant messages, data and other services are migrating at a rapid pace from the latter to the former.

In table 2.3 I present the same information for broadband services. The penetration ratios are measured in percentages of the population with broadband access.

**Table 2.3  Penetration ratios – broadband access***

|      | Subscriptions Mexico (% of population) | OECD average (% of population) | Mexico/OECD (%) |
|------|------|------|------|
| 2000 | -    | 1.29  | -  |
| 2001 | 0.07 | 2.53  | 3  |
| 2002 | 0.20 | 4.42  | 4  |
| 2003 | 0.39 | 6.80  | 6  |
| 2004 | 0.97 | 9.98  | 10 |
| 2005 | 2.18 | 13.92 | 16 |
| 2006 | 2.81 | 17.05 | 17 |
| 2007 | 4.14 | 19.97 | 21 |
| 2008 | 6.95 | 21.62 | 32 |
| 2009 | 8.76 | 22.62 | 39 |

* Data are taken from table 61, page 63 of the Study.

Table 2.3 tells the same story about broadband penetration as tables 2.1 and 2.2 did about fixed and mobile telephony. In 2000 broadband access had just begun in the richer countries and was virtually absent in Mexico. It picked up in 2004 and since then it has followed OECD trends with a lag of roughly 5 years. As a result, the penetration ratio for Mexico was at 3% as a fraction of the OECD average in 2001, but rose to 39% in 2009. If it is true that OECD penetration is getting close to saturation – the diminishing growth since 2007 is an indication – it is likely that Mexico will be close to OECD averages by 2015.

All trends described above are fully present in the figures of the Review for fixed, mobile and broadband services respectively, and are based on the same data as my tables.[13] The relative increase in penetration for fixed telephony and the general decline of fixed services worldwide is clearly observed in figure 1.1 of the Review. The 6 and 5 year lag for mobile and broadband services is observed in Figures 2.2 and 2.3. And the relative catching up is implicit. However, the Review ignores the time dimension of the graphs and prefers to mention that in 2009 Mexico's ranking: 34th of 34 members for fixed telephony, 33rd for mobile telephony and 34th again for broadband access.[14]

From the foregoing it becomes clear that the performance of the Mexican telecommunication industry has been quite acceptable during the first decade of this century and, given Mexico's stage of economic development and its relative position among OECD countries, it has been even more than that. If the OECD prefers to see it the other way and rather wants to sound alarming in order to strengthen the case for its recommendations, in my view it loses credibility for not recognizing the obvious.

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[13] Review, figures 1.1, 1.2, 1.3 on pages 19 and 20.

[14] It admits that by the end of 2010 Mexico had climbed to position for broadband services, but to dampen the effect of this observation it immediately reminds the reader that in 2004 its penetration ratio was only 0.98% against an OECD average of 9.71%. Recent success is blown away with a shameful past.

## 3.     The story of the welfare loss

**General remarks**

The Review states that a lack of competition in Mexican telecommunication markets has given rise to excessive prices and that those high prices, together with the resulting loss of consumption, have led to a welfare loss to the Mexican economy of 129.2 billion USDPPP over the period from 2005 to 2009, amounting to 1.8% of Mexico's GDP. This sounds alarming and, if it were true, it would be alarming indeed, as it implies that the Mexican telecommunication industry would hardly have generated any value added at all, when valued at competitive prices.

To get an idea of the order of magnitude of such an amount of money, it should be realized that it is more than what the Mexican Federal Government spent on social security over that period and almost half its budget for public education. Everybody agrees that competition is a powerful tool to discipline markets and to keep prices low, but an assertion that more or less competition in one single industry would be capable to give rise to gains or losses of such a magnitude, raises some suspicion to say the least.

According to the Review, "econometric techniques were used to estimate the loss in consumer surplus caused by the supposedly low degree of competition."[15] However, in the Review itself there is little clarity about the econometric exercise that was used to estimate the welfare losses. In the main text it only reports the magnitudes of the welfare losses and in Annex C only a few paragraphs are spent on a very general description of the main characteristics of the Study. More details can be found in a separate document published in the Digital Economy Papers Series of the OECD, a paper that remains unreferenced in the Review.[16]

**The loss in consumer surplus in a nutshell**

To calculate the loss in consumer surplus resulting from the supposedly low degree of competition in Mexican telecommunication markets, the Study first estimates the prices and the levels of demand that would have been observed if the degree of competition in those markets were at par with the average competition in the corresponding markets of other member countries. The prices and levels of demand obtained in this way are called *but-for* prices and *but-for* volumes. Second, by comparing actual prices with but-for prices and actual demand with but-for demand the Study arrives at an estimate of *overcharges* and an *unrealized demand*. The overcharge stands for what actual consumers paid in excess and constitutes the first component of the welfare loss; the unrealized demand stands for consumers that did not buy at the actual price, but would have

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[15] Review, Annex C, p. 137.

[16] Marta Stryszowska (2012), Estimation of Loss in Consumer Surplus Resulting from Excessive Pricing of Telecommunication Services in Mexico. OECD Digital Economy Papers, no. 191. The Series comes with a disclaimer on behalf of the OECD passing on any responsibility for those papers to the authors. In the paper itself there is no mention that the Study was undertaken for the purpose of the Review. The only way to know for sure that it is precisely that paper the OECD obtained its welfare losses from, is that all welfare losses reported in the Review coincide up to five digits with the welfare losses of the paper. For that reason, we assume in the following that the OECD, by subscribing the quantitative results and publishing them, accepts full responsibility for the methodology.

bought at the but-for price and constitutes the second component of the welfare loss. The first component (the transfer from consumers to producers) is obtained by multiplying actual demand with the overcharge. The second component (the loss from unrealized demand) is obtained by multiplying the overcharge with unrealized demand and dividing the result by 2.

The Review does not make a clear distinction between welfare and consumer surplus. It speaks about welfare loss when it means to say a loss in consumer surplus and it even interprets the first component as "a loss of benefits to the economy" although this component is just a transfer from consumers to producers.[17] With the estimated overcharges and the actual demand figures the Study arrives at an estimate of 67 billion USDPPP for the first component for the three services under analysis (fixed telephony, mobile telephony and broadband services). Ie., actual customers are said to have paid 67 billion USDPPP in excess for the services they received.

The loss in consumer surplus due to unrealized demand (the second component) is reported to be 62 billion USDPPP for the three services together. This is surprisingly high, as it implies that the estimated unrealized demand would be almost twice the actual demand levels for the three services on average. If this were true, the Study would predict but-for penetration ratios for Mexico far above OECD averages. Evidently, this is quite implausible.

A possible explanation would be that the demand function is not linear. This is because for non-linear demand the second component of the welfare loss may be larger than unrealized demand times the overcharge divided by 2. This would be the case if demand were concave, an unlikely situation because demand is usually supposed to be convex. Moreover, throughout the Study demand is assumed to be a linear function of price and even if this assumption would have been given up for the calculation of consumer welfare losses, other inconsistencies would have arisen, which should have drawn the attention of the analysts.[18]

**The mistakes of the Study**

Trying to find an explanation for the implausible losses in consumer surplus due to unrealized demand, it became clear that the way in which these losses were obtained was not by multiplying the unrealized demands with overcharges and dividing the result by 2, as the Study suggests in its figure 7 one page 14, but by multiplying them instead with the but-for prices themselves. This is a fundamental error with far-reaching consequences.

The mistake is illustrated in figure 1. This figure is a replica of figure A1 of the Review and figure 7 of the Study, but extended so as to indicate the error. The welfare loss from unrealized demand is the surface of the corresponding triangle. As becomes clear from the figure, it is indeed equal to the unrealized demand times the difference between the actual and the but-for price divided by 2

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[17] Review, page 9 and 11.
[18] For example, on a few occasions the second component is not only greater than the overcharge times unrealized demand divided by 2, but even greater than the overcharge times unrealized demand without dividing by 2. This is theoretically impossible as it implies that buyers who did not buy due to the high prices, would be willing to pay more than the overcharge to buy the services. So why did they not buy in the first place? This happens, among others, with the mobile service basket from 2003 to 2008.

for being a triangle. However, instead of taking the correct triangle, the Study takes the wrong one by not multiplying with the overcharge, but with the but-for price.

**Figure 1. The wrong triangle**
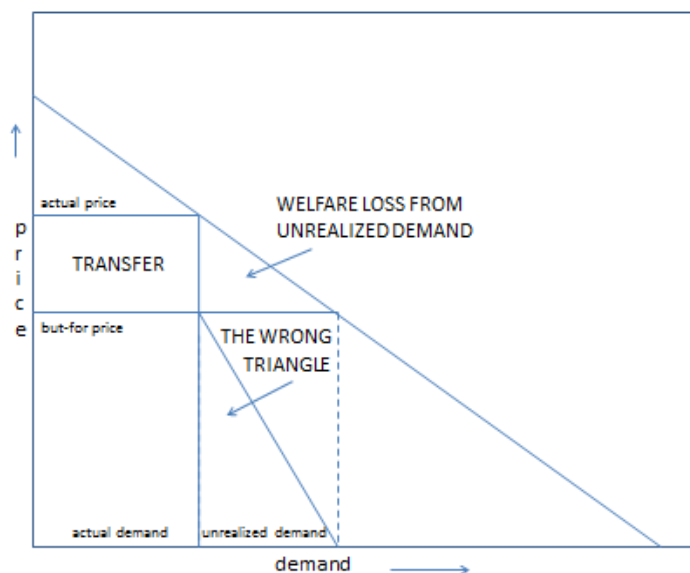


To give an idea of the order of magnitude of the consequences of that mistake I calculated the loss in consumer surplus due to unrealized demand with the correct formula using exactly the same figures for overcharges and unrealized demand as the ones reported by the Study. The result was that out of the 62 billion USDPPP for the second component of the welfare loss 38 billion is due to the mistake. That is, correcting for the mistake only 24 billion, ie. less than 40%, remains.

Yet, if this mega-mistake were the only mistake of the Study and the OECD would have recognized it, the Review would have reported a welfare loss of 91 billion USDPPP, instead of 129 billion. This amounts to only 1.3% of Mexico´s GDP, but would still be an alarming figure. However, the mega-mistake is not the only mistake; there are some other less obvious errors, which are set out in the following. These errors are not calculation errors, but have to do with the interpretation of the results. I demonstrate that correcting for all errors any remaining welfare loss virtually disappears. That is, after correcting for all errors the Study predicts an almost vanishing welfare loss. To show this, I first describe the main features of the Study and its underlying logic.

**The logic of the Study**

The purpose of the Study is threefold. First it is to establish a quantitative relationship between the strength of competition in the markets and the observed prices. The hypothesis is that the stronger the competition, the lower the prices, but it remains to be seen how much stronger leads to how much lower. That is the first question the exercise seeks to answer. Once such a relation is established, it becomes possible to predict the prices that would be observed in Mexican markets if competition were at OECD levels. This hypothetical situation is the but-for situation.

The second purpose is to establish a similar relationship between price and demand levels, ie. to estimate a demand function. Here, the hypothesis is that lower but-for prices lead to a higher but-for demand. Throughout the Study it is assumed that the degree of competition has no direct influence on demand levels, but that its influence is only indirect, ie. through prices, in itself a reasonable assumption.

The third purpose of the Study is to estimate the loss in consumer surplus attributable to the lack of competition in Mexican telecommunication markets. This is achieved by setting price and demand levels observed in the actual situation against price and demand levels obtained in the but-for situation, in which competition is stronger. As argued below, it is precisely here where the interpretation errors occur.

The independent variables of the price function comprise, apart from the degree of competition, some other variables such as the territorial extension, the land use and the urbanization rate, which are assumed to have a bearing on the costs to provide the services. The independent variables of the demand function comprise, apart from price, some population variables such as its size, age structure and the so-called female rate. There has been some experimentation with other variables, but most of them were dropped in the course of the process for not being statistically significant. Only in the demand function for broadband services the per capita income and a variable called cable share play a moderate role. The dependent variables are assumed to be linear functions of the independent variables; only for the population size there is also a quadratic term.

The price function makes it possible to define an overcharge. The overcharge is defined as the difference between the actual price and the but-for price. The demand function makes it possible to predict the level of demand that would be realized if there was no overcharge, ie. but-for demand. Unrealized demand is then defined as the difference between the but-for and the actual demand.

The price and demand functions were estimated for the three services separately (fixed telephony, mobile telephony, broadband services) on a cross-country sample covering all member countries of the OECD minus Mexico (OECD-1) over a time period from 1990 to 2009. Observations for which information on some variable was lacking were omitted. From the description it is not completely clear how the 3SLS technique was structured, but here I am just interested in the results and take the way in which they were estimated for granted.

Ie., for the time being I assume that the econometric study by itself was properly performed, that the price functions resulting from the exercise correctly represent the relation between the degree of competition and price, and that the estimated demand functions correctly represent the relation between price and demand. Even then, there is a problem with the way in which the Study interprets the but-for price as the price that would have been observed in Mexican markets with more competition, and with the way in which the but-for volumes are interpreted as the demand that would be realized if prices were at but-for levels.

**Estimating overcharges**

To show what is happening, let us consider the price function for fixed telephony.[19] The variable accounting for the degree of competition is the variable called regulatory barriers. The higher the regulatory barriers to competition, the higher the price. The correlation coefficient is indeed positive and equal to 238.2. What does this figure mean? It means that with a unit increase in the regulatory barriers variable the price increases by 238 units. However, the regulatory barriers variable can never increase by one unit. In the cross-country sample it is in between a minimum of 5% and a maximum of 62% during the period from 1990 to 2007 with a mean that gradually decreases from 48% to 24%.[20] The price is expressed in USDPPP for the basket of fixed telephony services (PSTN).

Hence, according to the estimated price function, a difference in the regulatory barriers of 10% leads to an overcharge of 23.8 USDPPP and a difference of 20% to an overcharge of 47.8 USDPPP. Now, assuming that regulatory barriers for Mexico were at the maximum level of the sample from 2005 to 2007 (38%, 38% and 35%) and that the but-for level would be at the mean (24%, 24% and 23%) the estimated demand function leads to overcharges of 32, 32 and 29 USDPPP for 2005, 2006 and 2007 respectively.[21] However, the Study arrives at estimates for the overcharges of 381, 396 and 212 USDPPP for those years, ten times what the price function can explain. How is that possible?

The reason is that the but-for price is wrongly interpreted as the price that would hold in the Mexican market if competition had been at par. Such an interpretation is only correct when the estimated price function predicts the actual price with actual competitive conditions correctly. But it does not. The price function underestimates actual prices by enormous residuals. Assuming then that that same price function, which fails to predict the actual price by a large amount, predicts the price of the but-for situation correctly is unrealistic.

It is like trying to hit a moving target. With the first shot you miss it by a large stretch. If you then want to make a chance with your second shot, you must not only adjust for the displacement of the target meanwhile, but also for the missed stretch. The study only adjusts for the displacement of the target. The first shot is the actual situation. The shot itself (the price function) misses the actual price by the residual. The second shot is the but-for situation. The only thing that is adjusted for with the second shot is the displacement of the target (the degree of competition). The sniper did not learn from his first failure. Declaring then the but-for price as the price that would be obtained if competition were at par, is like erroneously assuming the second shot hit the target.

This is exactly what the Study does when it defines overcharges as the difference between actual prices, which are wrongly predicted by the price function, and but-for prices, obtained with the same price function that is now supposed to predict the price in the but-for situation correctly. By

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[19] Stryszowska (2012), p. 41.
[20] Stryszowska (2012), p. 30.
[21] For 2005: (38% - 24%) 238.2 = 32

doing so, the residuals are included in the overcharges and are wrongly attributed to a lack of competition.

This may give rise to such strange outcomes as indicated above. For example, it may happen that competition in a Mexican market is not weaker but equally strong as the OECD average, or even stronger. Even in that case there may be a positive overcharge attributed to a lack of competition which is absent. The overcharge is no more than the residual. This happens with the price function for broadband services among others, in which there is no variable at all representing the degree of competition.[22] Even so, the Study reports important overcharges due to a lack of competition.[23]

**Estimating unrealized demand**

The same mistake is made with the estimation of the unrealized demand. Unrealized demand is defined as the difference between but-for demand resulting from estimated demand and actual demand which is wrongly predicted by that demand function. By doing so, unrealized demand includes again the residual of the prediction of actual demand and attributes it to higher prices.

For example, demand for the basket of fixed telephony services has a correlation coefficient with price of -0.0145.[24] That means that a decrease in price of 100 USDPPP leads to 1.45 million more subscriptions. Overcharges for 2005, 2006 and 2007 are estimated at 381, 396 and 212 USDPPP respectively.[25] That would lead to an unrealized demand of 5.5, 5.6 and 3.1 million for those years. Yet, unrealized demand reported by the Study are at 24.83, 24.34 and 23.16 million subscriptions; ie. 4 to 7 times higher.[26] According to the demand function such high levels of demand can only result from very negative prices.

**Estimation of the welfare loss from weak competition without mistakes**

In this subsection I estimate the welfare loss that is obtained without the mistakes. Thereto I took the price and demand functions estimated by the Study for granted, as well as the data on actual demand. I did not need data on actual prices because overcharges from a lack of competition follow from multiplying the differences in the degree of competition with the corresponding correlation coefficient. Likewise, unrealized demand was obtained by multiplication of the corrected overcharges with the corresponding correlation coefficients. Finally, I avoided the mega-mistake in obtaining the welfare loss from unrealized demand.

As the Study does not report values for the degree of competition in Mexican markets, I had to make an assumption about it. For the variable of regulatory barriers to competition in the price function for fixed telephony I assumed that Mexico was at the maximum of the OECD in the actual situation and at the mean in the but-for situation.[27] For mobile services I assumed that Mexico had

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[22] Stryszowska (2012), p. 64.
[23] Stryszowska (2012), p. 68.
[24] Stryszowska (2012), p. 41.
[25] Stryszowska (2012), p. 45, table 41.
[26] Stryszowska (2012), p. 47, table 42.
[27] Stryszowska (2012), p. 30, table 26.

4 operators in the actual situation, as reported by the Review, and that in the but-for situation Mexico was at the mean of the sample.[28]

In table 4.1 I present the results of the recalculation of the welfare losses for the fixed telephony basket. In the third and fourth row the overcharges really attributable to weak competition are compared with the overcharges reported by the Study. The differences are due to the mistaken inclusion of the residual for Mexico in the latter. The unrealized demand really due to the lack of competition was obtained by multiplying the proper overcharges with the correlation coefficient of the demand function. Compared with unrealized demands reported by the Study practically nothing is left. This is due to the fact that not only the residual in the price function, but also that in the demand function is suppressed. Welfare losses from transfers and from unrealized demand were obtained with the standard formula but avoiding the mega-mistake. The year 2009 was omitted because the Study does not report any welfare losses for that year.

**Table 4.1 Recalculation of welfare losses avoiding errors**

|  | 2005 | 2006 | 2007 | 2008 | Total |
|---|---|---|---|---|---|
| **Price** | | | | | |
| (in USDPPP) | | | | | |
| competition upgrade | 0.14 | 0.14 | 0.12 | 0.12 | |
| correlation coefficient | 238.2 | 238.2 | 238.2 | 238.2 | |
| overcharge lack comp. | 33 | 33 | 29 | 29 | |
| overcharge Study | 381 | 393 | 212 | 319 | |
| | | | | | |
| **Demand** | | | | | |
| (in million subscriptions) | | | | | |
| actual consumption | 19.51 | 19.86 | 19.87 | 20.49 | |
| correlation coefficient | 0.0145 | 0.0145 | 0.0145 | 0.0145 | |
| unrealized demand | 0.48 | 0.48 | 0.41 | 0.41 | |
| unrealized demand Study | 24.83 | 24.34 | 23.16 | 20.17 | |
| | | | | | |
| **Welfare losses** | | | | | |
| (in billion USDPPP) | | | | | |
| Transfer | 651 | 662 | 568 | 586 | 2,467 |
| transfer study | 7,433 | 7,865 | 4,212 | 5,536 | 26,047 |
| unrealized demand | 8 | 8 | 6 | 6 | 28 |
| unrealized demand Study | 6,844 | 7,649 | 7,099 | 6,565 | 28,157 |
| | | | | | |
| **Total welfare loss** | 659 | 670 | 574 | 592 | 2,495 |
| **Total welfare loss Study** | 14,277 | 15,514 | 11,311 | 13,101 | 54,204 |

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[28] Review, p. 28, table 1.6, and Stryszowska (2012), p.31, table 27.

The result is astonishing; out of the 54.2 billion USDPPP reported by the Study for the total welfare loss for fixed telephony from 2005 to 2009 only 2.5 billion remains, ie. less than 5%.

I did not recalculate welfare losses for mobile telephony services for the simple reason that the only variable in the price function accounting for the degree of competition is the number of mobile competitors and that the number of mobile competitors in Mexico was larger than the OECD mean. So whatever overcharges were found by the Study, these cannot be attributable to a lack of competition. Likewise, I did not recalculate welfare losses for the broadband services because there was no variable at all representing the degree of competition in the price function. Once more, any welfare loss found by the Study for those services cannot be attributed to a lack of competition in that market.

Altogether, not scapegoating the supposedly weak competition in telecommunication markets for effects it did not cause, or at least for effects for which there is no evidence from the Study that they were caused by weak competition, out of the total welfare loss of 129.2 billion USDPPP reported by the Review for the period from 2005 to 2009, only 2.5 billion is left. The rest is due to calculation and interpretation errors. All this under the wrong conviction of the OECD that it is preferable to perform international price comparisons in USDPPP. When prices are measured in nominal USD, overcharges disappear, there is no unrealized demand, nor any welfare loss.

## 4.    The design of the econometric study

So far I have accepted the econometric study as it stands, and also its results in terms of but-for prices, but-for volumes and correlation coefficients. My critique has been on the way in which these results were interpreted, leading to overcharges, unrealized demand and welfare losses that are largely unrelated to the presumed lack of competition in Mexican telecommunication markets. In this section I launch some critical remarks about the study itself; not so much about the technique of the exercise – the information provided in the paper is insufficient to go into such details – , but about the choice of the variables and about a few highly surprising outcomes that make me suspicious of whether the design of the underlying model has been appropriate.[29]

First of all, the variables employed in the model to account for the degree of competition in the markets are disappointingly imprecise. Where the main purpose of the model is to quantify the effects from a lack of competition on prices, on demand levels and ultimately on welfare, one would expect somewhat more sophistication from the independent variables accounting for the degree of competition.

In the exercise there are three such variables: the HHI industrial concentration index, for mobile services the number of operators in the market and a third variable referred to as regulatory barriers to competition. The first two are typically structural parameters whose role as indicators

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[29] For a more thorough critique of the Study see Jery A. Hausman and Agustín J. Ros (2012), Correcting the OECD's Erroneous Assessment of Telecommunications Competition in Mexico".

for the strength of competition has increasingly been criticized in the industrial organization literature. The third is also a broad spectrum variable, elaborated by the OECD itself.

As regards the HHI concentration index, probably the most precise variable of the three, there is little clarity in the paper about the detail of specification. According to the Study, there were only 174 observations, just sufficient to cover one of the three services for OECD-1 for 6 years, and indeed, the index was only used for the estimation of the price function for mobile services.[30] Anyway, the variable did not survive the experimentation process, most likely for not being statistically significant. At the end of the road, the HHI index does not appear in any of the three estimated price functions, so that it has no predictive power at all for the purpose of the Study. That is a fairly disappointing result which remains uncommented upon in the paper.

Similarly, the second variable (the number of mobile operators) only figures in the estimation of the price function for mobile services, where it turned out to be statistically significant with a correlation coefficient of –56. That is, with every additional operator the price of the mobile basket decreases by 56 USDPPP. However, here the surprise is the range of the interval of the variable, the mean of the distribution and the relative position of Mexico. Among the 176 observations the number of mobile operators varies from 2 to 6 with a mean of 3.72.[31] However, Mexico has counted with 4 operators in the mobile market over the period of the Study, ie. more than the mean of the sample.[32] As this second variable is the only one that figures in the estimated price function, the conclusion must be that, according to this variable, competition in the Mexican mobile market was not weaker than the OECD-1 benchmark, but even stronger.

The third variable, that of regulatory barriers to competition, only appears in the price function for fixed telephony. It is drawn from an OECD data base on product market regulation.[33] For the telecommunication sector this data base contains very general information on entry conditions, state ownership and market structure. As regards entry conditions, there are three possibilities: monopoly, duopoly or competitive. Since 2000 the data base registers competitive conditions in trunk telephony, international services and mobile telephony for practically all OECD members except some Eastern European newcomers and Turkey. The only notorious exception is Mexico which for some obscure reason is reported as a duopoly since 1997. This in spite of the fact that Mexico has counted since a long time with multiple operators in fixed telephony and with 4 in the mobile market.[34] My conclusion is that the information on this issue in the data base for Mexico is simply not reliable.

With respect to state-ownership, the Mexican incumbent telephone company was privatized in 1990 and since then the State has had no share in the telephone industry.[35] By contrast, some other member countries still saw a significant state participation as of 2007. Thus, according to

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[30] Stryszowska (2012), p. 36, table 32.

[31] Stryszowska (2012), *ibidem*.

[32] Review, p. 28, table 1.6.

[33] See http://www.oecd.org/document/32/0,3746,en_2649_34323_35791136_1_1_1_1,00.html

[34] Review, p. 21 , table 1.3.

[35] After privatization the State kept some shares without control but floated those shares in international markets in the following years.

this variable, regulatory barriers for Mexico must also have been lower than OECD averages. Finally, regarding market structure, according to the database the market share of new entrants in Mexico has indeed been low, although in trunk telephony more than half of the OECD members had an even lower share in 2007.

In summary, not even in the variable of regulatory barriers Mexico can have done such a bad job as the Study makes us believe. The values used for Mexico to estimate the but-for price are not reported in the Study, so that I do not know them, but from a quick look at the data base it becomes clear that entry barriers are wrongly registered for Mexico, that since two decades there is no state-ownership in the Mexican industry, but that the share of new entrant remains low.

Altogether, my conclusion is that the econometric exercise largely failed its goal to establish a causal link between the degree of competition and the excessive pricing in the telecommunication markets in Mexico. Out of the three variables accounting for the degree of competition, that of regulatory barriers turns out to have a moderate predictive power for the price of the fixed telephony basket, the number of mobile operators does a better job, but works in the opposite direction and the HHI concentration index doesn't play a role at all. For broadband services none of the three variables figures in the price function. How it is possible that the Review arrives at such outspoken conclusions about the existence of a causal link between competition and prices from such imprecise and broad-spectrum variables and such weak correlations remains an open question.

Another outcome that raised suspicion about the credibility of the Study, is that all but-for prices for Mexico for all three services under Study are below the average (or mean) prices of the OECD.[36] That is to say, if Mexican markets would have enjoyed competition at average OECD levels, Mexican prices would have been substantially lower than average prices in other member countries. Not just in USD, but even in USDPPP; in USD they would have been 40 to 50% lower. That is what the econometric study tells us.

This is hardly credible. What is it that makes that Mexican consumers would enjoy much lower prices than consumers in other member countries if the degree of competition would be at par? What local conditions make that Mexico enjoys not only an absolute, but even a comparative advantage in telecommunication services?[37] It must be due to the other independent variables in the price function. But which of them qualifies? Confining myself to fixed telephony, it cannot be the territorial extension which rather works against Mexico. Neither can it be the urbanization rate which also works against Mexico with its large rural population.[38] The only possibility is the land-use variable which remains largely unexplained in the Study.

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[36] Stryszowska (2012), p. 45, table 40, p.50, table 46, p. 60, table 55, p. 62, table 60 and p.67, table 64. The only exception is the but-for price for the mobile basket for 2008 of 382 USDPP against the OECD mean of 337 USDPPP.

[37] As explained in Annex 1, comparing prices in USDPPP is like measuring comparative advantages.

[38] According to the Study the urbanization rate for Mexico is slightly higher than the OECD average. This surprising as the rural population is reported to be at 36% against an OECD average of 26%, and the mean urbanization rate for the OECD is at 75%. Stryszowska (2012), p. 44; Table 23 on p. 28, and Review, p.16.

Another feature that draws the attention is that the functional specifications of the model are linear. This is not explicitly stated but becomes clear from the results. To check whether such specifications are reasonable, a systematic analysis is required of the distribution of the residual error terms. As I understand, no such systematic analysis has been carried out, at least nothing is mentioned in the Study. As a result the estimated functions may be far off the mark particularly for outliers, ie. observations at the border of the cloud of observations, such as those for Mexico. The enormous residuals reported for Mexico in the previous section are an indication of such misspecification.

Another result that raises suspicions about the credibility of the Study is the virtual absence of per-capita income in the demand functions. As I understand, the variable has participated in the experimentation process for all three services, but only survived the statistical significance test in the demand function for broadband access. For fixed and mobile services per-capita income does not play a role. Evidently, this has to do with the well-known identification problem. Is one really estimating a demand function from a cloud of observations of volume and price? Or are supply-side factors also playing a role? Such questions are too complex to discuss them here, but as a general rule penetration ratios depend more on supply-side factors than on prices.[39]

A last doubt about the econometric study is of a more general nature. If such a study establishes a significant causal relationship between the lack of competition and high prices, but afterwards it appears that prices were not high in absolute terms, but only high relative to general price levels, as I have shown is the case for Mexico, what does the Study really prove? Is it that there is a causal relationship between the lack of competition in telecommunication markets and the general price levels in all markets? That is hardly believable. Such causal relations are like blaming the plague in your garden on your neighbor to find out later that there is no plague at all, but that you forgot to spray the flowers for a week.

## Setting the record straight

In its "Review of Telecommunication Policy and Regulation in Mexico" of January 2012 the OECD claims that, for a lack of competition in Mexican telecommunication markets, prices in those markets are excessively high, that as a consequence penetration ratios of the basic services are disappointingly low and that this has led to a loss of welfare to the Mexican economy of 129.2 billion USD over the period from 2005 to 2009, ie. 1.8% of Mexico's GDP. On the basis of these findings it makes a number of recommendations regarding the regulatory system in order to enhance the effectiveness of that system and in that way promote competition in the Mexican telecommunication industry.

In this article I have criticized the findings of the OECD regarding the excessive prices, the low penetration ratios and the welfare losses, for being based on two fundamental misconceptions, which brought about these alarming results. The first misconception is that it is preferable to

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[39] See Hausman and Ros (2012).

measure prices in purchasing power parity dollars for comparing them across countries. I show that, when prices are compared in nominal dollars, the story of the high prices in Mexico falls apart. In that case Mexican prices are not higher but lower than OECD averages and recently even substantially lower. I do not only disagree with the OECD as to the convenience of using PPP comparisons, but also explain why such comparisons constitute an improper use of the PPP methodology.

The second misconception stems from an econometric study employed by the OECD to estimate the price and demand levels that would have been observed in Mexican telecommunication markets if competition in those markets would have been at par with competition in other member countries. By comparing these so-called but-for prices and but-for demands with actual prices and demands, the Study defines for each of the services under study an overcharge and an unrealized demand, presumably resulting from a lack of competition. Finally, the Study estimates welfare losses from overcharges and unrealized demand.

Apart from being improperly designed, the econometric study suffers from some serious mistakes, varying from simple calculation errors to errors in the interpretation of the results. Particularly, the Study attributes to a lack of competition what in reality is due to completely different factors. I have demonstrated that, after correcting for the mistakes, only little remains of the estimated overcharges, unrealized penetration and welfare losses.

The purpose of this article has not been to criticize the multiple recommendations of the OECD aimed at improving the Mexican regulatory system and strengthening competition in Mexico's telecommunication markets. It may well be that competition can be enhanced further, that regulators need more independence and powers, that the double-window character of the regulatory regime does not contribute to its effectiveness and that the peculiarities of the Mexican injunction system open possibilities to abuse. It may well be that removing the limits on the foreign ownership in fixed telephony would have a beneficial impact on competition and that giving the fixed incumbent a chance to play triple would bring some desirable competition to the market of television services.

For sure, with all those recommendations we have our second thoughts. For example, giving more independence and powers to regulators should go hand in hand with greater transparency and accountability. Everybody agrees with that. Regulators, even if they act with good faith to the best of their knowledge in the interest of the consumers, are faced with the difficult task to strike an adequate balance between more competition in markets downstream and preserving sufficient incentives to expand infrastructure upstream. Moreover, they are often acting under the pressure of the news media and a sometimes misguided public opinion. Therefore, as long as there are no possibilities to appeal their decisions to an independent body, the Mexican injunction system, for deficient as it may be, remains the only recourse to challenge decisions taken by regulators that are not by definition benevolent.

All this is open to discussion and I am the last person to object to such a debate. However, the Review presents its recommendations as if they would follow from the excessive pricing, the resulting underperformance in penetration and the consequent welfare losses. As I have shown in

this article, there is no such excessive pricing, no such underperformance and there are no welfare losses either. In fact, the recommendations of the Review are hardly related to the results of the Study and perhaps better so, for if they depended on them, those results are questionable to say the least.

What I do criticize in this article, is the deplorable state of backwardness depicted by the Review of the Mexican telecommunication industry. This simply does not correspond to reality. Mexican prices for telecommunication services, when measured by a proper standard, are not excessively high, but fairly competitive. Given Mexico's stage of development and its per-capita income, penetration ratios of the basic services are quite acceptable and steadily catching up with OECD averages over the last decade. And last but not least, the welfare losses to the Mexican economy, resulting from this presumed state of backwardness, is not more than a fable supported by a poorly designed econometric study full of embarrassing mistakes.

## Annex 1. Purchasing Power Parity: Proper and Improper Uses

This annex pretends to demonstrate that the way in which the OECD compares prices of telecommunication services between countries, by first converting them to purchasing power parity dollars (USDPPP) before comparing them, is inappropriate for the purpose of its analysis of the telecommunications industry in Mexico. Thereto, I first set out what purchasing power parity (PPP) is, then explain what PPP indices are intended for, next spell out what PPP price comparisons for individual items actually stand for, and finally explain why the way the OECD compares prices of individual items among countries is inadequate for its analysis.

**Purchasing power parity**

The concept of PPP emerged in the theory of international trade as an indicator of the point at which exchange rates are in equilibrium. The hypothesis of PPP was that an exchange rate is in equilibrium when the two involved currencies, converted to each other at that rate, have the same purchasing power in the home countries to those currencies. To give an example, if the rate of exchange of the Mexican peso to the US dollar is 10 to 1, there is purchasing power parity if 10 pesos buy the same in Mexico as 1 dollar in the US.

This is usually not the case. With the amount of pesos you can get for one dollar at the current exchange rate you can buy more in Mexico that what one dollar can buy in the US. That is to say, Mexico is a cheap country in comparison with the US. Generally speaking, not a single exchange rate in the world is in equilibrium in the meaning of the PPP hypothesis and it is unlikely that any of them will ever be.

Since that state of affairs was clearly recognized, PPP has gradually left behind its role as an indicator of exchange rate equilibrium and has taken up another role: that of making the size of economies and the per capita incomes comparable between countries. For example, when the GDP of the Mexico amounts to 1 trillion dollar and that of the US to 15 trillion, this does not imply that the economy of the US is 15 times as big as the Mexican. As a result of price differences US citizens cannot buy with their 15 trillion 15 times what Mexicans can buy with their trillion. Therefore, it is customary to express the Mexican GDP in USDPPP, which makes it, say, 1.5 trillion. If so, the US economy is no longer 15 times the Mexican, but only 10 times.

Likewise, when measured in PPP dollars per capita income in Mexico with 100 million inhabitants would no longer be 10,000 dollars per year, as it is in nominal dollars, but 15,000 and, when this amount is compared with per capita income of the US of 50,000 (300 million inhabitants), the latter is not 5 times the former, as one would expect from a comparison in nominal dollars, but only 3.3 times.

To be able to correct income and per capita income comparisons between countries for differences in purchasing power one needs a basket of goods and services representative of the total expenditures in both countries. Unfortunately, expenditure patterns in one country are usually quite different from expenditure patterns in other countries and that is precisely one of the main obstacles to construct proper and unique PPP indices. Nevertheless, for the purpose of

this exposition I assume for simplicity that there is such a basket holding N products i (i = 1, … , N) and that the composition of the basket is given by quantities $Q_i$. In the next formula the value of this basket at Mexican prices is compared with its value at US prices:

$$(1) \quad PPP^{MEX-EU} = (P_1^{MEX}Q_1 + .... + P_N^{MEX}Q_N) / (P_1^{EU}Q_1 + .... + P_N^{EU}Q_N)$$

If Mexican prices are expressed in pesos and US prices in dollars, $PPP^{MEX-EU}$ is a "shadow" exchange rate, ie. an exchange rate corrected for differences in purchasing power. If, on the other hand, Mexican prices are expressed in nominal US dollars, converted at the prevailing exchange rate, $PPP^{MEX-EU}$ is a scalar factor to correct the nominal exchange rate for purchasing power differences. For example, if $PPP^{MEX-EU}$ is 2/3 (Mexican prices are on average two-thirds of US prices), it is this factor that converts the Mexican GDP of 1 trilion USD into 1.5 trillion USDPPP, as described above. In the following I interpret the PPP index in the second sense, ie. as a scalar factor, not as a shadow exchange rate.

According to formula (1) the PPP index is nothing else than a price index for which US prices are the base. The only difference is that normal price indices are employed to make comparisons between different periods, for example to measure inflation or economic growth in real terms, whereas the PPP index is used to make comparisons across countries.

In the following table I present PPP indices with respect to the US for all the member countries of the OECD from 2000 to 2009. The figures are obtained by dividing yearly averages of nominal exchange rates by the PPP shadow exchange rates presented in Annex Tables A.1 and A.2 of the Communications Outlook of 2011.[40] OECD averages are calculated as unweighted geometric averages, so as to preserve reflexivity and because the OECD averages and means of the Study were also obtained without weighting.

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[40] OECD, Communications Outlook, 2011 (preliminary version). The same data are also available under the heading Statistics at the official OECD site.

**Tabla 1. Purchasing power parity indices for OECD countries***

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 1.32 | 1.45 | 1.38 | 1.14 | 1.00 | 0.94 | 0.94 | 0.84 | 0.81 | 0.88 |
| Austria | 1.21 | 1.22 | 1.19 | 1.00 | 0.92 | 0.91 | 0.93 | 0.84 | 0.80 | 0.85 |
| Belgium | 1.22 | 1.26 | 1.23 | 1.01 | 0.90 | 0.89 | 0.90 | 0.82 | 0.78 | 0.84 |
| Canada | 1.21 | 1.27 | 1.28 | 1.14 | 1.06 | 1.00 | 0.94 | 0.89 | 0.86 | 0.95 |
| Chile | 1.90 | 2.20 | 2.33 | 2.25 | 1.90 | 1.68 | 1.46 | 1.40 | 1.43 | 1.51 |
| Czech Republic | 2.72 | 2.67 | 2.29 | 2.01 | 1.80 | 1.67 | 1.61 | 1.46 | 1.20 | 1.37 |
| Denmark | 0.96 | 0.98 | 0.95 | 0.77 | 0.71 | 0.70 | 0.71 | 0.66 | 0.64 | 0.68 |
| Estonia | 2.38 | 2.34 | 2.22 | 1.84 | 1.66 | 1.60 | 1.53 | 1.32 | 1.25 | 1.38 |
| Finland | 1.09 | 1.10 | 1.06 | 0.88 | 0.83 | 0.82 | 0.84 | 0.78 | 0.74 | 0.80 |
| France | 1.16 | 1.22 | 1.17 | 0.94 | 0.86 | 0.87 | 0.88 | 0.82 | 0.77 | 0.83 |
| Germany | 1.12 | 1.17 | 1.13 | 0.97 | 0.90 | 0.93 | 0.95 | 0.88 | 0.84 | 0.89 |
| Greece | 1.58 | 1.67 | 1.61 | 1.29 | 1.16 | 1.13 | 1.14 | 1.02 | 0.97 | 1.03 |
| Hungary | 2.62 | 2.59 | 2.24 | 1.86 | 1.61 | 1.55 | 1.64 | 1.40 | 1.33 | 1.60 |
| Iceland | 0.93 | 1.10 | 1.00 | 0.81 | 0.74 | 0.64 | 0.65 | 0.57 | 0.75 | 0.97 |
| Ireland | 1.13 | 1.12 | 1.06 | 0.87 | 0.80 | 0.80 | 0.81 | 0.76 | 0.72 | 0.80 |
| Israel | 1.18 | 1.23 | 1.37 | 1.25 | 1.27 | 1.21 | 1.21 | 1.14 | 1.00 | 1.05 |
| Italy | 1.33 | 1.38 | 1.26 | 1.04 | 0.92 | 0.93 | 0.96 | 0.89 | 0.87 | 0.92 |
| Japan | 0.70 | 0.81 | 0.87 | 0.83 | 0.80 | 0.85 | 0.93 | 0.98 | 0.88 | 0.81 |
| Korea | 1.52 | 1.70 | 1.63 | 1.50 | 1.44 | 1.30 | 1.23 | 1.21 | 1.40 | 1.59 |
| Luxembourg | 1.16 | 1.18 | 1.14 | 0.94 | 0.87 | 0.84 | 0.87 | 0.79 | 0.75 | 0.79 |
| Mexico | 1.55 | 1.48 | 1.47 | 1.58 | 1.56 | 1.53 | 1.52 | 1.48 | 1.49 | 1.76 |
| Netherlands | 1.22 | 1.23 | 1.18 | 0.96 | 0.89 | 0.90 | 0.92 | 0.85 | 0.81 | 0.86 |
| New Zealand | 1.52 | 1.62 | 1.47 | 1.15 | 1.00 | 0.93 | 1.04 | 0.91 | 0.95 | 1.08 |
| Norway | 0.96 | 0.98 | 0.88 | 0.78 | 0.75 | 0.72 | 0.74 | 0.67 | 0.64 | 0.70 |
| Poland | 2.36 | 2.20 | 2.23 | 2.11 | 1.97 | 1.73 | 1.68 | 1.50 | 1.30 | 1.68 |
| Portugal | 1.55 | 1.58 | 1.50 | 1.25 | 1.12 | 1.18 | 1.20 | 1.11 | 1.05 | 1.13 |
| Slovak Republ. | 2.91 | 3.08 | 2.85 | 2.20 | 1.87 | 1.82 | 1.78 | 1.50 | 1.33 | 1.40 |
| Slovenia | 1.75 | 1.79 | 1.70 | 1.40 | 1.31 | 1.31 | 1.31 | 1.16 | 1.08 | 1.13 |
| Spain | 1.48 | 1.51 | 1.45 | 1.18 | 1.06 | 1.05 | 1.08 | 1.00 | 0.95 | 1.01 |
| Sweden | 1.00 | 1.10 | 1.04 | 0.87 | 0.81 | 0.80 | 0.81 | 0.76 | 0.75 | 0.86 |
| Switzerland | 0.91 | 0.92 | 0.88 | 0.76 | 0.71 | 0.71 | 0.76 | 0.75 | 0.70 | 0.71 |
| Turkey | 2.21 | 2.86 | 2.46 | 1.94 | 1.76 | 1.62 | 1.69 | 1.51 | 1.46 | 1.69 |
| Un. Kingdom | 1.04 | 1.11 | 1.06 | 0.96 | 0.86 | 0.86 | 0.87 | 0.77 | 0.84 | 0.98 |
| United States | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **OECD average** | **1.38** | **1.44** | **1.38** | **1.18** | **1.08** | **1.05** | **1.06** | **0.98** | **0.94** | **1.03** |

* OECD Communications Outlook, 2011 (preliminary version) Annex Tables A.1 and A.2. Also available at www.oecd.org under the heading statistics.

The PPP indices of this table are the scalar factors used to convert GDP and income per capita of the involved countries to USDPPP. They are the inverse of the index defined in formula (1). That is, for Mexico they are PPP$^{EU-MEX}$, not PPP$^{MEX-EU}$. An index greater than 1 implies that the country is cheap in comparison with the US, when the index is smaller than 1 the country is comparatively expensive.

From the table it becomes clear that Mexico was the cheapest country of all members of the OECD during the last two years of the period. At earlier stages a number of Eastern European countries, Portugal, Greece, Turkey and Chile were cheaper, but these countries entered the OECD relatively recently and have since then become more expensive. The fact that Mexico is among the cheapest countries is of utmost importance for the outcomes of PPP price comparisons of the Review and, consequently for the interpretation of its results; all its conclusions are critically dependent on it.

**Use of PPP**

As already mentioned above, the purpose of PPP indices is to make the magnitude of GDP and of per capita income comparable across countries. The indices achieve this aim by converting a comparison of the **value** of a basket of goods and services between two situations to a comparison of the **quantity** or **volume** of that basket between those situations, just as a normal price index does.[41] In such cases it is not only the prices that differ from one situation, but also the quantities and the aim is to arrive at a comparison of the size.

In spite of the difficulties involved in a proper measurement of PPP indices, among which the definition of a representative basket of goods and services is the worst of all, there is a general consensus that the PPP methodology is the proper way to make GDP, per capita income and broad categories of final demand expenditures comparable across countries. However, the way in which the OECD employs PPP indices to convert price comparisons of telecommunication services from nominal US dollars to USDPPP, is an entirely different story. It is no longer about the conversion of a value index to a quantity index, but about expressing the prices themselves in a presumably common currency called USDPPP. Moreover, it is no longer about a revaluation of the basket using a price index for only that basket; it is about a revaluation of the price of a single good with a price index for the whole basket.

**Why PPP price comparisons for individual items are inappropriate for the analysis**

First of all, expressing prices of individual items in USDPPP rather than in nominal USD implicitly suggests that USDPPP is a kind of super-currency, better suited than the nominal currency to make prices comparable across countries. However, there is no such currency as USDPPP, at least not a common currency. A USDPPP for Norway is quite a different measure from a USDPPP for Mexico, as for Norway it involves general price levels in Norway, whereas for Mexico it involves general price levels in Mexico.

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[41] As is well known, the value index of a basket of goods from a base situation to another is equal to the Laspeyres index for prices times the Paasche index for quantities, and symmetrically to the Paasche index for prices times the Laspeyres index for quantities. So the quantity index for the basket can be obtained by dividing the value index by the price index of the other kind.

Effectively, if a particular item is more expensive in Mexico than it is in Norway when measured in USDPPP, it may well be that the item is not more expensive at all, but that the general price level in Norway is so much higher than the general price level in Mexico that the item itself is only more expensive in appearance. Particularly, for very cheap countries such as Mexico (or for extremely expensive countries such as Norway) comparisons in PPP tell more about differences in general price levels than about price differences for individual items. Generally speaking, stating that a specific item is more expensive in one country than it is in another in USDPPP, is like stating that one man is taller in yards than another is in meters.

To explain what the OECD actually does when it compares prices of individual items in USDPPP, I assume that the nominal price of the item to be compared (item k) in Mexico is $P_k^{MEX}$. Expressing the price of the item in USDPPP delivers the following result:

$$(2)\ P_k^{MEX*} = P_k^{MEX} (P_1^{EU}Q_1 + …. + P_N^{EU}Q_N) / (P_1^{MEX}Q_1 + …. + P_N^{MEX}Q_N)$$

where $P_k^{MEX*}$ is the price in USDPPP.

Likewise, the price of the item in the Netherlands expressed in USDPPP is:

$$(3)\qquad P_k^{HOL*} = P_k^{HOL} (P_1^{EU}Q_1 + …. + P_N^{EU}Q_N) / (P_1^{HOL}Q_1 + …. + P_N^{HOL}Q_N)$$

where $P_k^{HOL}$ is the price in nominal dollars in the Netherlands and $P_k^{HOL*}$ the price in USDPPP. Note that Mexican and Dutch prices in USDPPP are not expressed in a common measure. The Mexican price has the general price level in Mexico in the denominator, the Dutch price the general price level in the Netherlands.

By dividing (2) by (3) one arrives at the following comparison of the Mexican price with the Dutch price in USDPPP.

$$(4)\qquad P_k^{MEX*}/P_k^{HOL*} = \{P_k^{MEX}/(P_1^{MEX}Q_1 +..+ P_N^{MEX}Q_N)\}/\{P_k^{HOL} /(P_1^{HOL}Q_1 +..+ P_N^{HOL}Q_N)\}$$

As observed in this formula, there is no direct comparison between the Mexican and the Dutch price, but rather a comparison between the relation of the Mexican price with the general price level in Mexico and the same relation in the Netherlands. In fact, the first expression between brackets on the right-hand side stands for the relation between the Mexican price and the value of the full basket in Mexico while the second expression between brackets stands for the same relation in the Netherlands.

That is, if in Mexico the item is more expensive in comparison with the full basket than it is in the Netherlands, then the item is more expensive in Mexico in terms of PPP. Yet, it may well be that the item is not more expensive at all, but that, given the fact that in the Netherlands cars are twice as expensive as in Mexico, gasoline three times and domestic services at least four times, it is rather these services, which form part of the full basket, that create the false perception that the item is more expensive in Mexico.

All price comparisons of telecommunication services performed by the OECD carry this bias. As shown in section 1 of this paper, when Mexican tariffs are no longer compared in USDPPP, but just in nominal dollars, the story of the high prices in Mexico falls into pieces. In that case Mexican

prices happen to be below OECD averages in the 2005-2009 period, and more recently even substantially so.

**Absolute versus comparative advantages**

The distinction between price comparisons in nominal dollars and comparisons in USDPPP is equivalent to the distinction often made in the theory of international trade between absolute and comparative advantages. By using such comparisons in USDPPP the OECD measures comparative advantages or disadvantages, but in the Review under comment it interprets the disadvantages as if they were absolute.

From a theoretical perspective, international price comparisons in USDPPP might still be a useful instrument in a comparative analysis of consumption and expenditure patterns across countries. Why do Mexicans spend a greater part of their incomes on domestic services or on fuel-intensive cars? The answer to such questions depends less on absolute than on comparative price relations. But if the analysis is about comparing the efficiency and the performance of a single sector, as is the case with the OECD Review, one should not work with comparative but with absolute price differences.

To expect Mexican telecommunication operators to charge the same tariffs in **its own** USDPPP (meters) as industries in other member countries charge in **their** USDPPP (yards) is not realistic. It is like demanding them to become in comparative terms as cheap as the full basket, including cars, gasoline and domestic services. There are still arguments to defend such a point of view for industries that are intensive in production factors which abound in the country at stake, but it is not reasonable to ask it from an industry, such as that of telecommunications, which is little intensive in unskilled labor but rather intensive in high tech. After all, high technology is acquired at international prices in USD, not in USDPPP. Or should Mexican operators require from Ericsson to sell them its equipment at USDPPP for being a Mexican company?

**Final remarks**

PPP indices are estimated from nominal price comparisons with the purpose to convert value comparisons to quantity comparisons, particularly to compare GDP, income per capita and expenditures of final demand across countries. Their purpose is not to improve upon the price comparisons that served as an input to build them. The latter is exactly what the OECD takes them for. Why the OECD does so is unclear. Probably it believes that, where it is preferable to compare GDP and per capita income in PPP, it must also be preferable to compare prices in terms of PPP. It sounds logical, but there is no theoretical justification for it, at least not that I know of.

A possible argument for working with prices expressed in USDPPP is that such prices are more resistant to foreign exchange shocks than prices in nominal USD. That is, if there is a sudden large devaluation of the currency of a country, local prices expressed in USD express such changes immediately, whereas prices expressed in USDPPP do not, because the general price level is affected in the same way. Thus, prices in USDPPP are less volatile than prices in USD. However, such considerations are much more relevant for an inter-temporal analysis than they are for a cross-country analysis, which is the case of the Review. After all, exchange rate shocks do affect

the competitive position of a country significantly and such changes should be taken into account in that kind of analysis.[42]

Yet, the OECD has been using such PPP comparisons for telecommunications services for at least fifteen years and it has explicitly declared its preference for PPP price comparisons over nominal comparisons ever since. In its country study about Regulatory Reform in the Telecommunications Industry in Mexico of 1998 it states: "In general it is considered that the PPP figures provide a more reliable comparison", but it is not mentioned who considers that nor why.[43] In the Review under discussion it states: "PPP prices are more relevant to assess relative price levels across countries as they take into account the purchasing power of Mexican consumers and businesses. Moreover, the application of the PPP methodology to telecommunication price baskets is an example of good use of the methodology."[44] Again, there is no justification for this point of view, unless the account that is taken of the purchasing power of consumers and business should be interpreted as such. But why account should be taken of the purchasing power of consumers and businesses with price comparisons for individual items, remains unexplained.

Strangely enough, the OECD, together with the Statistical Office of the European Communities, does not recommend the use of PPP exchange rates at low levels of product aggregation.[45] This seems to be in overt contradiction to the statements above.

Beliefs, particularly wrong beliefs that sound logical, turn to conventional wisdom when they are repeated time after time without being challenged for long periods. That is how they take root and become difficult to eradicate. In my view, the assumption that PPP comparisons are preferable to nominal comparisons is such a wrong belief; instead I have shown that PPP price comparisons for individual items is not an example of good use of the PPP methodology, but rather an example of improper use. Comparing prices for individual items in USDPPP is like using a gun to kill a fly. Guns are not made for that purpose, as PPP indices are not made to improve on price comparisons of individual items. A gun is definitely more a sophisticated instrument than a fly-flap, but you will definitely miss the fly.

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[42] For a discussion of the tension that always exists between inter-temporal and cross country aspects in the PPP methodology see Angus Deaton and Alan Heston (2008), "Understanding PPPs and PPP-Based National Accounts", National Bureau of Economic Research, Working Paper No. 14499.

[43] OECD (1998), Country Study, "Mexico – Regulatory Reform in the Telecommunications Industry", p. 40.

[44] Review, p. 38, note 7.

[45] Eurostat-OECD, Methodological Manual on Purchasing Power Parity, 2006, p.33.