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COMPETITION AND POVERTY REDUCTION

Contribution from Mexico

-- Session I --

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COMPETITION AND POVERTY REDUCTION

-- Mexico* --

Distributive and Regional Effects of Monopoly Power: Abstract

This report summarizes the research of Carlos Urzúa¹ for the Federal Competition Commission of Mexico on the distributive and regional effects of pricing by firms with market power in Mexico. It presents evidence that welfare losses due to monopoly are significant and regressive in the income dimension, and that they differ across urban and rural areas, and across each of the 32 states. The results suggest that in the urban sector the negative impact of monopoly power grows (in relative terms) as households become poorer. In the limit, the poorest households have a relative welfare loss about 19.8% higher than the one suffered by the richest. For the rural sector the redistributive impact is even more pronounced, since the first decile has a relative welfare loss of about 26.4% compared to the ninth decile, and of 22.7% compared to the tenth decile. On the geographic dimension, the state with the smallest relative welfare loss turns out to be Baja California, which lies at the farthest north, while the state with the largest loss is Chiapas, at the farthest south. In fact, Chiapas' relative welfare loss is 2.77 times larger than Baja California's. More generally, the southern states which are Mexico's poorest are those with the greatest welfare losses.

1. Introduction

1. At first glance, it seems natural to surmise that the welfare effects of firms with significant market power would vary according to consumers' income, or across regions; especially in the case of developing countries, where transportation costs tend to be high and consumers are poorly informed. Nevertheless, there have been few studies that explore these issues in detail in a developed or underdeveloped economy.

2. Among these: Comanor and Smiley (1975), McKenzie (1983), and Creedy and Dixon (1998 and 1999). Moreover, Hausman and Sidak (2004) explore the same issue for the particular case of long distance phone calls. Urzúa's work not only follows those authors in analyzing the distributive impact of firms with a significant market power in the case of Mexico, but also deals with regional effects.

3. Since the only expenditure survey available in Mexico, the one used here, is not longitudinal, it is not permissible to take the unit values (expenditure divided by quantity) as prices. Strictly speaking, those values reflect both commodity prices and their qualities. Thus, to circumvent that problem, Urzúa uses the model of spatial variations proposed by Deaton (1987 and 1990).

* Contribution submitted by Mexico's Federal Competition Commission. This paper summarizes the larger, more technical report prepared for the Federal Competition Commission of Mexico in 2008 by Carlos Urzúa. The report in Spanish is available at: <http://www.oecd.org/daf/competition/45047597.pdf> A summary in English by the author is available at: <http://alejandria.cem.itesm.mx/egap/documentos/EGAP-2009-04.pdf>

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2. Data on Household expenditures

4. Data for household income and expenditure survey are from the 2006 Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH for short.² The sample consists of 20,875 housing units. It was designed to be representative and provide reliable estimates at the national level, as well as at the urban and rural levels (the urban sector includes all localities with 2,500 or more inhabitants, while the rural sector includes the rest). Furthermore, the 2006 survey was representative of some, but not all, of the 32 Mexican states. The sampling method was stratified and multi-staged. Each primary sampling unit consisted of one or several “basic geo-statistical areas” (similar to the census tracts employed in other countries). The resulting 2,785 primary sampling units were subject to stratification based on socio-demographic variables to produce 392 strata from which the sample was drawn.

3. Markets

5. The selection of the markets under study is facilitated by the fact that in 2008 the Federal Competition Commission listed a number of sectors that it wanted to examine closely (CFC, 2008). The goods and services mentioned by the Commission that are also contemplated in the ENIGH are the following: corn tortilla; processed meats; carbonated soft drinks; cow milk; chicken and eggs; beer; medicines; electricity; liquefied gas; natural gas; and gasoline; intercity bus transportation; air traveling; elementary, secondary and higher education; long-distance, local and cell phone calls; internet; medical and hospital fees; and credit card payments.

6. Even though all the goods and services mentioned above are reported in the ENIGH, for most of them there is only information on household spending, not on unit values. This is the case for both the services and the energy consumption goods. This fact prevented Urzúa from estimating their corresponding price elasticities. Therefore, in this paper he focused solely on the following seven consumption goods for which unit values are indeed reported: corn tortilla; processed meats (ham, bacon, sausage, etc.); carbonated soft drinks (together with juices and bottled water); cow milk; chicken and eggs; beer; and medicines (whether purchased with or without a prescription).

4. Measuring welfare losses from market power

7. We summarize here the theoretical model and assumptions to estimate the distributional consequences of market power. More technical details are available at the original reports Urzúa (2008b, 2010).

8. It is assumed from the beginning that the social welfare cost of market power can be represented by the loss of consumers’ surplus. Although it is well known that welfare losses are much better estimated using utility based measures, such as equivalent variations, these measures cannot be calculated here.

9. Given a particular good, let p^m be the price charged to households by the firms with market power. We assume that the marginal cost of the supplier, c_m , is constant and equal to the competitive price that would prevail under perfect competition, p^c . As in Creedy and Dixon (1998), we further assume that the demand curve can be approximated by a linear demand function, in such a way that the loss of consumers’ surplus, B , can be calculated as:

$$B = \frac{(p^m - p^c)(q^c - q^m)}{2} \quad (1)$$

² The 2006 ENIGH survey was the latest available at the time of the study. Since then, a 2010 ENIGH survey has been released.

10. Denoting by η the elasticity of the demand for the good relative to its own price, then

$$\eta = \frac{(q^m - q^c) / q^m}{(p^m - p^c) / p^m} \quad (2)$$

and so, the welfare loss can be rewritten as:

$$B = \left(\frac{p^m - p^c}{p^m} \right)^2 \frac{p^m q^m (-\eta)}{2} \quad (3)$$

11. In order to calculate (3), we require not only an estimate of the elasticity, but also of the amount spent on the good, which can be obtained from the survey. We need also the estimated increase in relative prices due to market power, which depends on the particular industrial structure prevailing in the market. Each market is assumed to be an oligopoly with K identical firms, which produce the same good and make decisions according to the conjectural variations hypothesis. As a result, the price margin due to market power can be expressed as:

$$\frac{p^m - p^c}{p^m} = -\frac{1}{\theta\eta} \quad (3)$$

where θ is a function of the conjectural elasticities and of market shares. Thus, the total consumers' loss due to market power can be approximated as:

$$B = -\frac{p^m q^m}{2\theta\eta} \quad (4)$$

12. Once the value of θ is established, this formula requires an estimate of price elasticity and spending on each good. The value of θ depends in general on both the market shares and the conjectural elasticities. However, when the conjectural responses are those of the Cournot model, it implies $\theta=K$.

13. Finally, in order to be able to establish comparisons across groups of individuals, it is convenient to rescale the welfare loss. Let M be the number of goods purchased by consumers from firms with market power. A measure of the total welfare loss in relative terms can be found after dividing the welfare loss on each item by the total expenditure on the M goods:

$$L = -\frac{1}{2} \sum_{i=1}^M \frac{w_i}{\theta_i \eta_i} \quad (5)$$

Where w_i is the share of good i in total expenditure

5. Estimation of own price elasticities

14. As we said before, the reported unit values are not prices of the goods, because they reflect both commodity prices and their quality. Variations in unit values across households may be due to changes in the quality of goods purchased; for instance, the price difference between two cuts of beef can be quite significant. Under these conditions, it might seem impossible to estimate own-price elasticity. However, we can use an indirect procedure for that end: the model of spatial variations due to Deaton (1987 and 1990). Here, we describe the results and refer to the original report, Urzúa (2008b, 2010), for technical details.

15. The estimation results, for both urban and rural households, are presented in Table 1. As can be appreciated, the point estimates of the own-price elasticities seem to be reasonable in both sectors. Only the demand for milk is inelastic, at a level of significance of 5%.

Table 1. Own-price elasticities

	Elasticity	Standard error
Urban households		
Corn tortilla	-1.389	0.623
Processed meats	-0.507	0.103
Chicken and eggs	-1.087	0.324
Milk	-0.327	0.143
Carbonated soft drinks	-1.023	0.215
Beer	-1.082	0.12
Medicines	-1.842	0.472
Rural households		
Corn tortilla	-0.311	0.105
Processed meat	-0.456	0.295
Chicken and eggs	-1.559	0.5
Milk	-0.394	0.128
Carbonated soft drinks	-1.142	0.529
Beer	-1.462	0.204
Medicines	-1.117	0.438

6. Distributional and regional impacts

16. As noted earlier, if for each market we assume that firms produce a homogeneous product, have identical cost functions, and behave as in a Cournot game, then the measure of the total welfare loss in relative terms given in (11) can be rewritten as

$$L = -\frac{1}{2} \sum_{i=1}^M \frac{w_i}{K_i \eta_i}, \quad (6)$$

17. In order to compute (6) Urzúa specified the number of firms participating in each of the seven Cournot oligopolies.³ In the case of the corn tortillas, 70 percent of the supply of corn flour comes from a single company and the rest from a myriad of small producers and households across the country. He assumed $K=2$. The processed meat market, he assumed $K = 3$ because in that market there are three companies of relatively equal size. Another three firms used to control the chicken and eggs markets until very recently, when imports have brought some price discipline. Yet, in 2006, year of the survey, $K =3$ would still seem to be the most adequate value. In the case of milk, two companies control about 80% of the market, while the other 20% is geographically fragmented. Thus, for the simulation he took $K = 2$.

18. Regarding soft drinks, a single player has about two thirds of the sales. That agent has been fined previously by the Mexican Federal Competition Commission for monopolistic practices. Thus he set $K = 1$. In the beer market, Mexico is a classic case of a duopoly since there are only two producers. However, the market is segmented geographically, thus, he chose $K =1$. The final case, the market for medicines is the most complex with several producers. Yet, prices in Mexico are considerably high according to international standards. Since the most favored hypothesis to explain that phenomenon is conscious parallelism, he set $K = 1$.

19. Using the values determined above, the own-price elasticities given in Table 1, and data on households' income and spending, Table 2 presents estimates of the distributive effects of market power. The results are calculated by urban or rural area, and by decile of total monetary income (the lower the decile, the poorer the group). The relative welfare loss due to market power in the seven markets is presented for each household and the average of the losses among all households in each decile. Finally, those averages are expressed relative to the average of the decile that is affected the least by the market power of the firms.

Table 2. Welfare loss due to market power

Urban households		Rural households	
Decile	Relative loss	Decile	Relative loss
I	1.198	I	1.264
II	1.176	II	1.219
III	1.158	III	1.236
IV	1.134	IV	1.214
V	1.128	V	1.211
VI	1.109	VI	1.15
VII	1.073	VII	1.148
VIII	1.052	VIII	1.043
IX	1.036	IX	1
X	1	X	1.03

20. The estimates thus obtained are presented in the second and fourth columns of Table 2. The results suggest that in the urban sector, the negative impact of monopoly power grows (in relative terms) as households become poorer. In the limit, the poorest households have a relative welfare loss about 19.8% higher than the one suffered by the richest. For the rural sector the redistributive impact is even more serious, since the first decile has a relative welfare loss of about 26.4% compared to the ninth decile, and of 22.7% compared to the tenth decile.

³ We refer to the original articles for more detailed justification of these choices.

21. Given the substantial redistributive effects arising from monopoly power, Urzúa then analyzes the impact across the 32 Mexican states by using a similar procedure as the one mentioned earlier, except that now urban and rural households are classified by their home states, not by their incomes. Figure 1 illustrates the results. The state with the smallest relative welfare loss turns out to be Baja California, while the state with the largest loss is Chiapas; they are the northernmost and southernmost states of Mexico, respectively. In fact, Chiapas' relative welfare loss is 2.77 times larger than Baja California's. More generally, the southern states, many of which are Mexico's poorest, are those with the greatest welfare losses. What factors might explain these results? Urzúa gives two answers: the percentage of households that live in the rural sector in the case of each state, as well as the very diverse consumption patterns that exist in Mexico. For instance, a majority of rural households live in the south, and for them the most important component of their diet is corn tortilla.

Figure 1. Relative welfare losses in the states of Mexico



7. Summary of results

22. The results suggest that in the urban sector the negative impact of monopoly power grows (in relative terms) as households become poorer. In the limit, the poorest households have a relative welfare loss about 19.8% higher than the one suffered by the richest. For the rural sector the redistributive impact is even more pronounced, since the first decile has a relative welfare loss of about 26.4% compared to the ninth decile, and of 22.7% compared to the tenth decile. On the geographic dimension, the state with the smallest relative welfare loss turns out to be Baja California, which lies at the farthest north, while the state with the largest loss is Chiapas, at the farthest south. In fact, Chiapas' relative welfare loss is 2.77 times larger than Baja California's. More generally, the southern states which are Mexico's poorest are those with the greatest welfare losses.

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