

# More Market Concentration, More Poverty? Evidence from the Retail Sector in Mexico

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November 2017

## Abstract

Ample evidence shows that consumers are harmed by elevated prices arising from limited competition, however few research works have tried to answer what are the poverty effects of market concentration in developing countries. This paper contributes to the limited literature in this topic by studying the relationship between poverty and market concentration in the retail sector in Mexico. Taking advantage of comprehensive municipality-level panel data from poverty maps and market concentration measures produced with the economic censuses, we estimate a fixed effects model and instrument current indicators of market concentration with their lagged values. Preliminary results show that higher market concentration in the retailing sector raises the poverty headcount in the municipality. The evidence suggests that the effect takes place via higher prices.

**Keywords:** Market concentration, competition, poverty, Mexico

**JEL codes:** D43, I32, K20

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The findings, interpretations and conclusions in this paper are entirely those of the authors. They do not necessarily represent the view of the World Bank Group, its Executive Directors, or the countries they represent.

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## 1 Introduction

The search for instruments that will help governments in developing countries make more progress reducing poverty includes diverse policy areas, but rarely incorporates competition policy. Evidence on the effects of market concentration on poverty is remarkable scant and the existence of potentially opposite forces of competition's effect on the poor as consumers of essential goods and services and as owners of small businesses remains meagerly examined.

Ample evidence shows that consumers are harmed by elevated prices arising from limited competition, however few research works have tried to answer what are the effects of market concentration of poverty in developing countries. One of the reasons for this scarcity is the limited availability of data on market structures, ownership and characteristics of small firms and their employees.

This paper takes advantage of comprehensive municipality-level panel data from poverty maps constructed using the Population Census and from market concentration proxies produced with Economic Census, to study the impacts of market concentration on poverty rates in Mexican municipalities. Results show that higher market concentration in the retail sector raises the poverty headcount in the municipality. The evidence suggests that the effect takes place via higher prices.

In contexts in which the supply side does not operate in a competitive environment, part of the targeted transfers for the poor will translate into profits for the oligopolistic firms. The contribution of this work is relevant to evaluate effectiveness of social programs and the need to complementary interventions given the local market structures. Policymakers need to pay attention to the supply conditions in poor localities in terms of regulation but also in cases in which population size and geography may imply very limited substitution options for the poor.

The remainder of this paper is organized as follows: Section 2 presents a discussion of the motivation and related literature on the direct impacts of concentration and non-competitive economic structures on poverty. Then, section 3 describes the data and empirical strategy. Results of the model that estimates the effects on poverty of market concentration and various robustness checks are presented in section 4. The last section concludes.

## 2 Motivation and related literature

### *Theoretical background*

We follow the structured analysis of models with exogenous and endogenous income that link poverty to market concentration provided in Rodriguez-Castelan (2011). Based on particular functional forms so the relevant poverty measure can be calculated explicitly, the oligopolistic equilibrium is computed directly and comparative statics are developed in terms of the number of firms in a market of a homogeneous good to determine the conditions under which higher market concentration may reduce poverty. His results show that, under a setup with exogenous income, there is a negative price effect

of higher market concentration that increases poverty. The present paper aims at providing empirical evidence for this first derivation of the theoretical model. The intuition is straightforward, higher prices caused by less competition increase the poverty index since all consumers in the economy are worse off.

A second result in Rodriguez-Castelan (2011) is derived under a setup of endogenous income. In an economy where consumers have homogenous labor productivities and different levels of profit shares of the oligopolistic rents, he shows that the negative price effect of higher market concentration is always greater than the positive income effect of firm ownership. However, when consumers have heterogeneous productivities, if the profit share of the low-productivity consumers is large enough and there is a significant productivity gap between the low and high-skilled consumers, then poverty reduction is possible under conditions of increased market concentration. The approach in this paper is to examine potential heterogeneity in the effect to analyze the mechanisms and conditions in which the relation with poverty holds or not.

### ***Related empirical literature***

There is remarkable little evidence on the effects of market concentration on poverty and the existence and magnitude of two opposing forces modeled in Rodriguez-Castelan (2011), namely the negative effect of market concentration via higher prices on the poor and the positive effect via higher earnings for small poor entrepreneurs. A general finding in this literature is that high concentration is associated with higher prices, for example, Weiss (1989) and Evans and Kessides (1994). Other empirical studies dealing with the relationship between market concentration and commodity prices such as Lamm (1981), Cotterill (1986), and Waterson (1993) have found that concentration does raise prices, and that this phenomenon generates a welfare loss. In a similar line, Dobson and Waterson (1997) conclude that prices are likely to increase due to concentration, but that they might also fall as a result of greater efficiency. In a more recent, industry-specific study<sup>1</sup>, McRae, and Wolak (2007), look at the New Zealand electricity market finding that large suppliers submit higher offer prices when they have a greater ability to exercise unilateral market power.

While ample evidence suggests that policies that encourage market entry ultimately benefit consumers through lower prices (see, for instance Kitzmuller and Martinez Licetti, 2012), this first-best economic policy assumes perfect competition. Although no one expects 'perfect' competition, even less-than-perfect market take time to develop, and are seldom the case in developing countries.

For the case of Mexico, Urzua (2008) finds empirical evidence of social losses from the exercise of monopoly and oligopolies that are not only significant but higher for the poor.

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<sup>1</sup> Currently, structural empirical studies in economics tend to be firm and/or industry-specific, considering the underlying foundations of demand, cost, and competitive behavior of the industry in question.

Among a growing empirical literature, Busso and Galiani (2014) provide experimental evidence of the impact of entry of new grocery stores into a given market. They find that entry leads to significant reduction in prices. They do not find however effects on product and service quality.

Recently, Atkin, Faber and Gonzalez-Navarro (2015) tackle the question of whether more competition actually could damage the earning prospects of existing firms and their workers. They estimate the household welfare effect of foreign direct investments in retail. They find that foreign supermarket entry in Mexico causes large and significant welfare gains for the average household. Combining rich micro-data sources and bar-coded information on prices they estimate an effect of 6.2 percent of initial household income. The estimation suggests that most of the effect is driven by a significant reduction in prices. However, they also find evidence of traditional stores exiting the market, harmful effects to store profits and employment, and sizable adverse effects to labor incomes for workers in the traditional retail sector, even though in the aggregate these effects to labor incomes for workers in the traditional retail sector, even though in the aggregate these effects are flicked by the reductions in prices that benefit all households.

### **3. Data and empirical strategy**

Based on the models developed in Rodriguez-Castelan (2011) described in section 2, our empirical strategy focuses on the effects of variations in market concentration on poverty. This section presents a brief description of our data sources and the construction of a municipality-level panel of poverty measures and indicators of market concentrations for several sectors of economic activity.

#### ***Poverty Maps***

To construct poverty rates at the municipal level, we employ the small-area estimation methodology proposed by Elbers, et al. 2003. The basic idea is to impute income to households in the Population Census (and Population Counts), using a model that predicts income from a household survey. Empirical evidence based on this method has proven to be precise when applied to data from nations like Ecuador, South Africa, Brazil, Panama, Madagascar and Nicaragua (see Elbers, et. al. 2003, Alderman, et. al. 2002, and Elbers, et. al. 2001). In addition, the small-area estimation methodology has key advantages as it benefits from the strengths of both household surveys and census and avoids their weaknesses. More specifically, whereas most household surveys are only representative at high levels of aggregation (e.g., national, regional, urban/rural), census and count data provide total coverage (universality).<sup>2</sup> Typically, census data provides the inputs when welfare indicators at low levels of aggregation, such as municipalities, are needed. In Mexico, both the Census and the

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<sup>2</sup> Strictly speaking, Population Count data do not provide universal coverage as it consists of surveys not censuses. However, the sample size is large enough that the data can be disaggregated to the municipal level and the level of precision of estimates is extremely high.

Population Counts are representative at the municipality level, which is the unit of interest in this study.

However, the census has its limits. First, fewer variables are available compared to the more comprehensive household surveys. Second, one of the main weaknesses of this data, and the most relevant for this analysis, is the lack of information on income. Census data, not designed to comprehensively measure household income, provides an incomplete picture of the household's monetary circumstances, usually underreporting total income. On the other hand, household surveys such as the National Survey on Household Income and Expenditures (ENIGH), while only representative at the national and urban/rural level, are designed to measure more precisely household income and expenditures.

The method consists of taking the household survey to be a random sample of the total population (found in the census databases) and choosing the common variables between these sources. The distribution of the chosen variables is compared, looking for variables in which the sample mean is statistically equivalent to the population mean. The variables that are not rejected are used to model income with ordinary least-squares (OLS) regressions using household survey data. It is important to note that the coefficients obtained from the model cannot be economically interpreted--as some of them are endogenous--but they are still included to reduce prediction error. Finally, the parameters obtained from these income regressions are employed as predictors to generate the household income distribution in the census and count data.<sup>3</sup> We use the Population Censuses of 1990, 2000 and 2010, the Population Count of 2005, and editions of ENIGH that are closest to the respective census or count: 1992, 2000, 2005 and 2010.

Poverty measures are calculated using the Foster-Greer-Torbeck headcount ratio (FGT0) for the three official poverty lines in Mexico: food-based poverty (income required to acquire enough food to cover nutritional needs), "capabilities" poverty (includes income to cover basic nutrition along with a certain amount of income for health and education), and assets poverty (includes the elements of the capabilities lines plus clothing, housing and transport). Based on the same poverty maps methodology we also obtain estimates of the Gini and Theil indices as measures of intra-municipality income inequality.

### ***Indicators of Market Power***

The municipality-level indicators of market power are produced using data from Economic Census of 1999, 2004 and 2009. These indicators include estimates of the Hirschman-Herfindahl Index for

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<sup>3</sup> In order to construct poverty maps for a twenty-year period, the analysis identified fifteen common variables between the ENIGH and the Census and Population Counts, which can be used to generate around 35 indicators to construct the necessary income models. These variables include dwelling characteristics, socio-demographic characteristics and asset ownership. Moreover, to increase precision in the estimators, around 50 municipality-specific indicators were chosen, including geographical and socioeconomic variables derived from various sources (e.g., the Territorial Integration System, ITER; the National Population Council, CONAPO; and the Ministry of Social Development, SEDESOL).

sales, aggregate value, employment, total production, total inputs and fixed assets in several economic sectors.

The economic census is conducted every five years. Each edition collects data referring to economic activity carried out between January 1<sup>st</sup> and December 31<sup>st</sup> of the previous year. The objective of the census is to gather information from all economic units which manufacture goods, trade merchandise and provide services, in order to generate economic statistics at very detailed geographic and sector levels.<sup>4</sup> It includes fixed, partly fixed and household establishments but does not cover informal trade and the self-employed without a physical address.

The Herfindahl-Hirschman Index (HHI) calculates concentration ratios by squaring the market share of each firm in an industry. The formula can be expressed as follows:

$$HHI = s_1^2 + s_2^2 + s_3^2 + \dots + s_n^2 \quad (1)$$

Where  $s_n$  is the market share of the  $i^{\text{th}}$  firm with  $i=1,2,\dots,n$  expressed as fractions. The HHI ranges from 0 to 1, moving from a high number of small firms to a single monopolistic producer. It is often considered that an HHI lower than 0.1 indicates a competitive market, while values between 0.1 and 0.18 indicate moderate competitiveness and values above 0.18 indicate uncompetitive markets.

Although this index has the advantages of taking into account every firm in the industry and giving more weight to largest firms, it also has some limitations. For instance, it fails to consider barriers to entry and firm turnover. This is, the HHI does not make a difference between a highly concentrated market and one with a small number of firms currently operating in a market with fierce competition where firms regularly enter and exit. Taking into consideration these limitations, in section 4, the robustness analysis incorporates estimates of the ease and likelihood of new firms entering the industry.

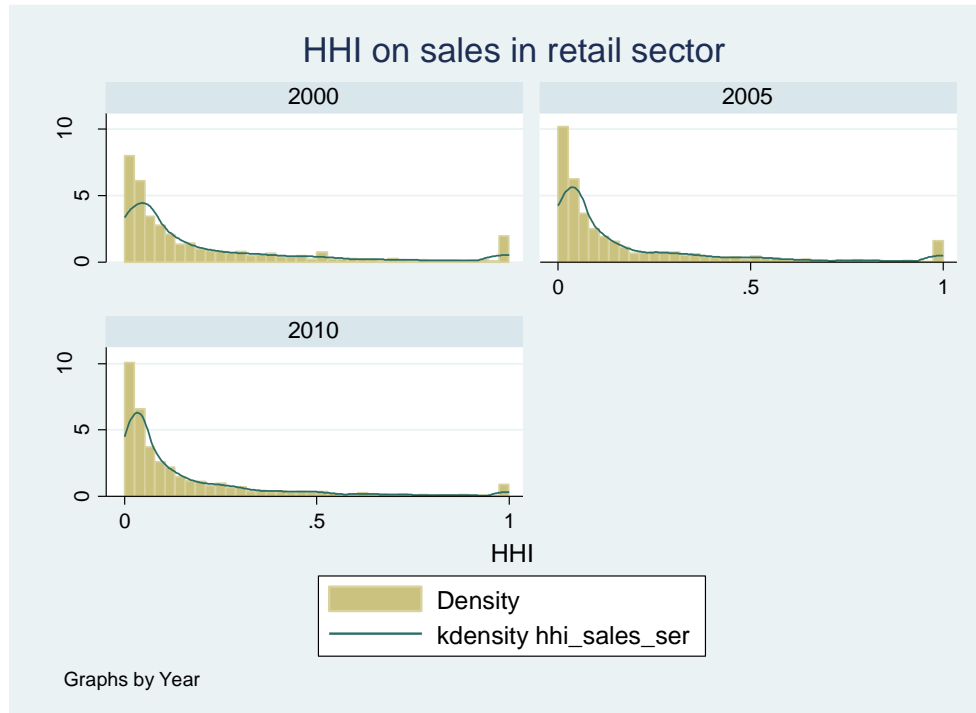
Given the interest of this paper, we focus on market concentration in the retailing industry –which includes all businesses that sell goods and services to consumers- as the main explanatory variable.

Figure 1 shows the distribution of municipalities according to their HHI in the retailing industry in 1990, 2000 and 2010. The distributions suggest a movement towards less market concentration over time.

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<sup>4</sup> Primary activities are not covered in the economic censuses but in the Agricultural census.

Figure 1.



### *Other variables*

Other variables at the municipality level included in the analysis, such as literacy rate, average years of schooling, proportion of rural population and the percentage of employed population by sector of activity, have been constructed from the 1990, 2000 and 2010 censuses as well as the 2005 Population count. Additionally, we use the average per capita public expenditure by municipality available at the National Institute of Statistics (INEGI) public database SIMBAD.

### *Descriptive Statistics*

We combine the data from poverty maps with the municipality-level measure of concentration, HHI, in the retailing industry and control variables to construct a panel dataset of 2,372 municipalities covering the period 1990 to 2010. Table 1 presents the summary statistics of the pooled dataset with 9,488 observations. Municipalities largely vary in population size, from a few hundred to more than 1.5 million inhabitants. The average share of municipal population considered poor -using the food-based poverty line- is 41 percent. The average municipality measure of market concentration measures by the HHI of sales in the retailing sector is 0.14.

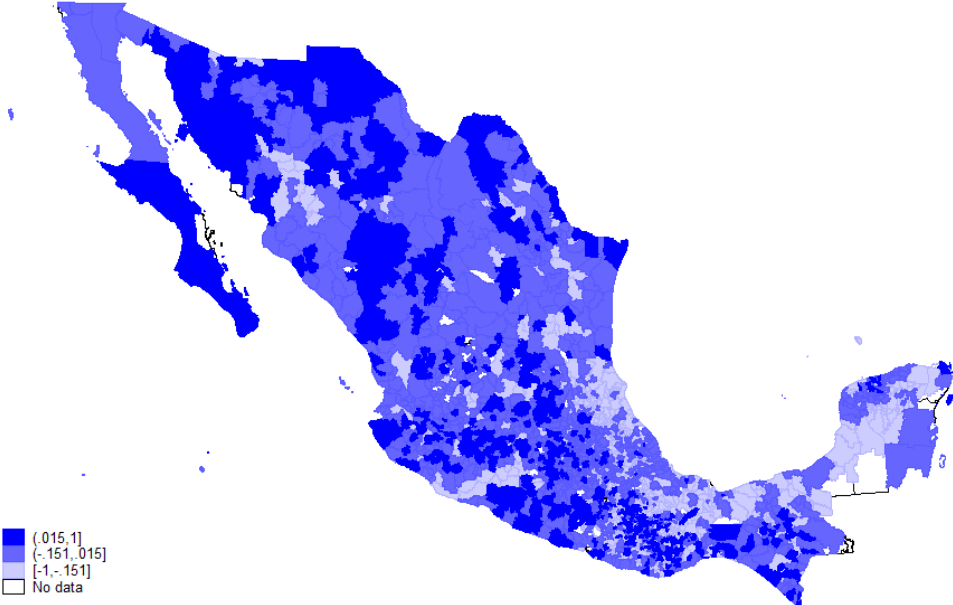
Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	N
<i>Poverty</i>					
FGT0 with food poverty line	0.41	0.23	0.00	1.00	9488
FGT0 with capabilities poverty line	0.49	0.23	0.00	1.00	9488
FGT0 with assets poverty line	0.69	0.19	0.01	1.00	9488
<i>Inequality</i>					
Gini index	0.38	0.06	0.17	0.64	9488
<i>Market concentration</i>					
HHI on sales in retail sector	0.14	0.15	0.00	1.00	7116
HHI on employment in retail sector	0.04	0.07	0.00	1.00	7116
HHI on fix assets in retail sector	0.11	0.14	0.00	1.00	7116
HHI on aggregate value in retail sector	0.13	0.15	0.00	1.00	7116
HHI on total product in retail sector	0.13	0.15	0.00	1.00	7116
HHI on total input in retail sector	0.16	0.18	0.00	1.00	7116
<i>Municipality socioeconomic characteristics</i>					
Total population	40669	120400	219	1803890	9488
Proportion of rural population	0.87	0.29	0.00	1.00	9488
Average years of schooling (pop>18)	6.04	1.62	1.10	13.50	7116
Literacy rate	0.82	0.12	0.14	0.99	9488
Average monthly per capita income	931.11	710.57	44.82	9067.07	9488
Log of average income	9.65	0.52	7.30	11.74	9488
% of employed in primary sector	43.68	24.53	0.03	99.79	8420
% of employed in secondary sector	26.27	14.59	0.00	91.29	8413
% of employed in tertiary sector	28.01	14.69	0.34	84.67	8417
Kilometers of road network	161.77	252.78	0.00	4076.00	5669
Average per capita public expenditure	1863.12	1862.55	0.00	20101.48	9488
Log of average per capita public expenditure	7.18	1.08	-0.66	9.91	8660

Variation in poverty over time is shown in Figures 2a and 2b for the periods 2000 to 2005 and 2005 to 2010, respectively. Figures 3a and 3b describe the variation in market concentration, measured by the HHI, in the retailing industry within municipalities over time.

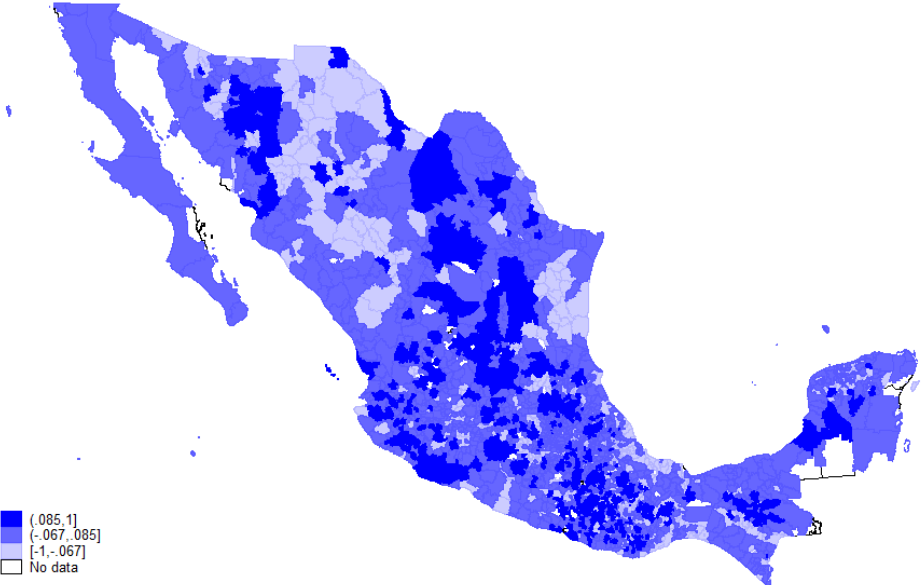


Figure 2a. Variation in poverty headcount by municipality between 2000 and 2005



Source: Author's own estimations using ENIGH and Population Census/Counts.  
Note: This map reports the change in Headcount ratio (food poverty line) between 2000-2005 by municipality.  
The national non-weighted average of the change was -.068, the standard deviation (sd) .166.  
The light blue are the municipalities where the indicator fell more than half s.d, while the dark blue are the municipalities where the indicator grew more than half s.d.

Figure 2b. Variation in poverty headcount by municipality between 2005 and 2010



Source: Author's own estimations using ENIGH and Population Census/Counts.  
Note: This map reports the change in Headcount ratio (food poverty line) between 2005-2010 by municipality.  
The national non-weighted average of the change was .009, the standard deviation (sd) .152.  
The light blue are the municipalities where the indicator fell more than half s.d, while the dark blue are the municipalities where the indicator grew more than half s.d.

Figure 3a. Variation in concentration index by municipality between 2000 and 2005

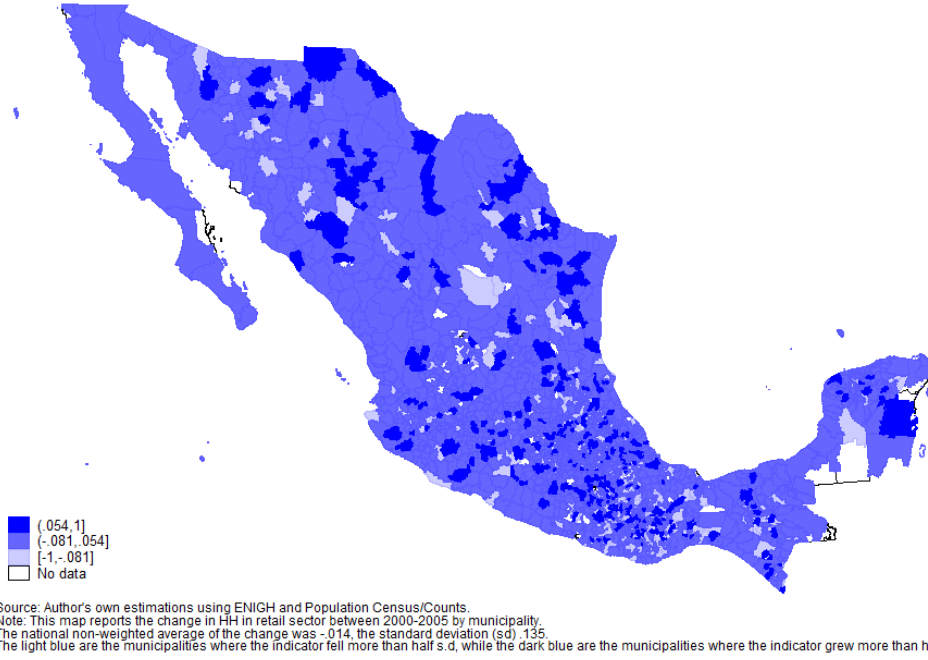
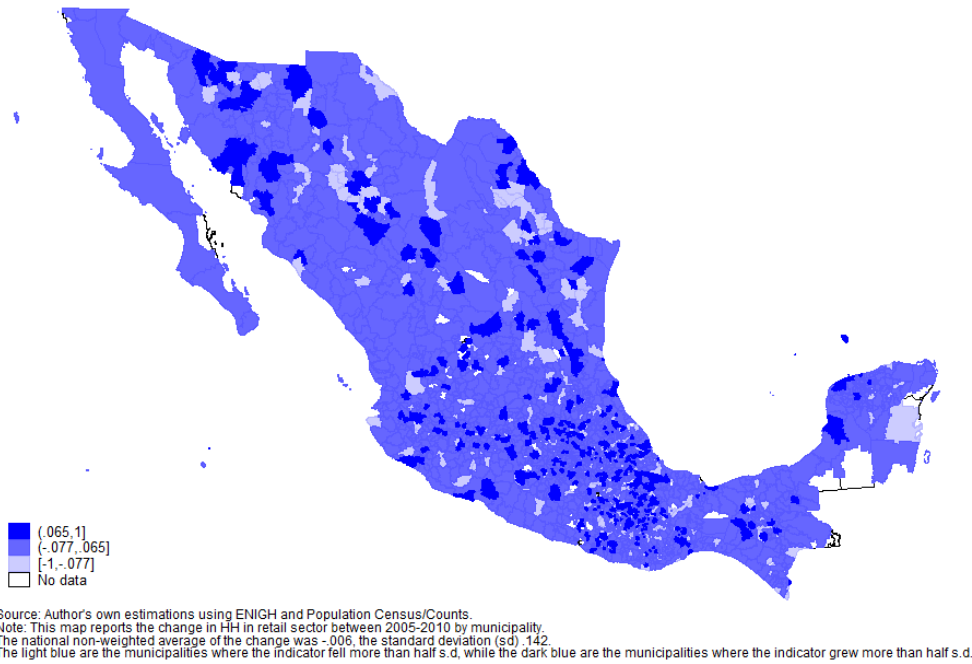


Figure 3b. Variation in concentration index by municipality between 2005 and 2010



### ***Empirical Strategy***

The main challenge in estimating the causal impact of market concentration on poverty is that unobserved characteristics of municipalities that may be correlated with the geographic distribution of market power may also play a role in local well-being. That is, if geographic areas with higher levels of market concentration are also areas with higher levels of poverty, a simple comparison between municipalities with oligopolistic market structures could lead to finding of a spurious positive relationship between higher market concentration and poverty rates. To address this challenge we suggest a fixed effects regression framework.

Let us consider the following baseline model:

$$Y_{it} = \beta' MktConcentration_{it} + X'_{it}\rho + \alpha_i + \varepsilon_{it} \quad (2)$$

where  $i=1, \dots, N$  and  $t= 1, \dots, T$  are used to index municipalities and time, respectively;  $Y_{it}$  is the municipality level poverty rate at time  $t$ ,  $MktConcentration_{it}$  is the relevant indicator of market power in municipality  $i$  in time  $t$ , and  $X'_{it}$  is a vector of time-varying municipality characteristics. Finally,  $\alpha_i$  are the (unobserved) municipality effects and  $\varepsilon_{it}$  is the error (idiosyncratic) term.

To the extent that omitted variables correlated with the geographic distribution of market power and poverty are time invariant they will be captured by the municipality fixed effects, for example extension of municipal territory or distance to the border. Regarding control variables in vector  $X'_{it}$ , we include the logarithm of total population in the municipality, proportion of rural population, literacy rate, logarithm of average income in the municipality, logarithm of per capita public expenditure, share of population employed in primary, secondary sectors (we leave out the tertiary sector as reference variable) and finally the road network in the municipality measured in kilometers.

Table 2 provides the results of estimating five different specifications of equation (2). First, municipality poverty share is regressed on the market concentration index in the retail sector without controls or fixed effects, column (1) shows that we obtain a positive and significant coefficient that remains significant but decreases in magnitude when we introduce municipality fixed effects, as shown in column (2). Results presented in column (3) and (4) suggest that an increase of one standard deviation in the market concentration measure will be associated to an increase of a third of a percentage point in the poverty headcount measured by the FGT0. Finally, column (5) shows that the estimate remains the same even when introducing dummy variables for the year of poverty estimation. Overall, the estimate for the main explanatory variable remains positive and significant once controls and fixed effects are introduced.

Table 2. Effect of market concentration on poverty, OLS and FE estimations

	Dependent variable is FGT0 with food poverty line				
	(1)	(2)	(3)	(4)	(5)
HHI in retail sector	0.246*	0.047*	0.023*	0.021**	0.021**
	(0.020)	(0.017)	(0.007)	(0.010)	(0.010)
Log Total Population			0.006*	-0.014	-0.012
			(0.001)	(0.010)	(0.011)
Proportion of rural pop in mun			-0.119*	-0.090*	-0.091*
			(0.004)	(0.015)	(0.015)
Literacy rate			-0.274*	0.018	0.100
			(0.021)	(0.064)	(0.076)
Log Median income			-0.394*	-0.381*	-0.383*
			(0.006)	(0.005)	(0.005)
Log of per capita public expenditure			0.013*	-0.021*	-0.017*
			(0.002)	(0.004)	(0.004)
Share of pop. employed in manufactures sector			-0.001*	-0.001*	-0.001***
			(0.000)	(0.000)	(0.000)
Share of pop. Employed in primary sector			0.000	0.001***	0.001*
			(0.000)	(0.000)	(0.000)
Road network (km)			0.000*	-0.000	-0.000
			(0.000)	(0.000)	(0.000)
_cons	0.356*	0.382*	4.394*	4.438*	4.287*
	(0.004)	(0.003)	(0.055)	(0.118)	(0.135)
Number of observations	7,116	7,116	4,300	4,300	4,300
Municipality fixed effects	No	Yes	No	Yes	Yes
Time fixed effects	No	No	No	No	Yes

note: \* p<0.01, \*\* p<0.05, \*\*\* p<0.1

The validity of the estimates shown in columns (4) and (5) rests on the assumption that any omitted municipality characteristic correlated with both poverty and market concentration in the retail sector is time invariant. Remaining concerns about endogeneity come mainly from the possibility of double causality, this is that higher poverty levels at the local level may hinder contemporaneous firm creation and therefore cause market concentration. The presence of this relation would negatively bias the coefficient on the market power measure in (2). Given the period of data gathering of the Economic Census it usually would reflect local market structures corresponding to one-and-a-half to two years previous to the poverty data. However, to address concerns about potential double causality or remaining omitted variable bias we instrument for our measure of market concentration using its lagged value.

### *Instrumental Variable Approach*

The measure of market concentration lagged one period is highly correlated with current market concentration and very likely to be exogenous to current poverty levels. Supportive arguments for the validity of the instrument are given, on the one hand by the strong inter and intra-municipality correlation of the HHI measure with its lagged value. Columns 1, 3 and 5 in Table 3 show the first stage for each of the specification including different control variables. On the other hand, the timing argument in order for the exclusion restriction to hold: It is unlikely that poverty levels today have any influence on the prevalent market structure five years earlier, except through their effect on the current market concentration.

Table 3. Effect of market concentration in retail sector. Instrumental Variable Approach

	Food Poverty					
	First stage	IV	First stage	IV	First stage	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Instrument: Lagged value of Sales HHI in Retail	-0.389*		-0.413*		-0.387*	
	(0.024)		(0.026)		(0.027)	
Instrumented Sales HHI in Retail		0.106*		0.064**		0.075**
		(0.032)		(0.031)		(0.036)
Total population	0.000	-0.000*	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of rural pop in mun	-0.008	-0.069*	-0.006	-0.069*	-0.009	-0.067*
	(0.035)	(0.018)	(0.037)	(0.017)	(0.038)	(0.020)
Literacy rate	0.187***	-0.011	-0.259***	0.259*	-0.423*	0.290*
	(0.113)	(0.055)	(0.143)	(0.063)	(0.153)	(0.071)
Log Median income	-0.008	-0.421*	-0.012	-0.406*	-0.009	-0.396*
	(0.011)	(0.008)	(0.013)	(0.009)	(0.013)	(0.009)
Log of per capita public expenditure	-0.011	0.007	-0.018	-0.004	-0.006	-0.005
	(0.009)	(0.005)	(0.013)	(0.007)	(0.014)	(0.008)
Share of pop>12 in manufactures sector			0.001	-0.003*	0.001	-0.003*
			(0.001)	(0.000)	(0.001)	(0.000)
Share of pop>12 in primary sector			0.000	0.001**	0.000	-0.001
			(0.001)	(0.000)	(0.001)	(0.001)
Kilometers of road network					-0.000	0.000

					(0.000)	(0.000)
_cons	0.487*	4.467*	0.599*	4.291*	0.603*	4.158*
	(0.142)	(0.091)	(0.185)	(0.113)	(0.195)	(0.121)
Number of observations	4,147	4,147	3,448	3,448	2,996	2,996
Municipality fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	No	No	No	No

note: \* p<0.01, \*\* p<0.05, \*\*\* p<0.1

For the estimations shown in Table 3 we cluster standard errors at the municipality level – since the variation in the main independent variable is at the municipality level-. This means that our statistics are robust to heteroskedasticity and arbitrary within-municipality correlation.

#### 4. Results

In this section, we present our main results concerning market concentration effect on poverty. Our analysis proceeds in two steps. We first estimate the average effects of concentration in the retail industry on poverty headcount at the municipality level and present some robustness checks. Then we estimate heterogeneous effects of market concentration according to municipality characteristics, in particular, the share of rural population and the share of population employed in the different economic sectors.

The main results have been shown in Table 3. Columns 1 and 2 present the baseline model. The coefficient upon market concentration in all of the specification is positive and is significant at the 1% level. Its size suggests a sizable impact: a one standard deviation increase in the concentration index implies an increase of 1 to 1.5 points in the poverty headcount measured by the FGT0 with the food poverty line.

##### ***Robustness Checks***

This section considers a series of robustness checks. First, we estimate the effect on the poverty headcount measured by the FGT0 but using this time other poverty lines. Market concentration in retail sector is expected to have an effect on the poor given their restriction to cover essential needs such as food and clothing, however as the poverty line represents higher amounts and therefore the restrictions are less binding in terms of the coverage of essential goods and services, we should not expect an effect of market concentration.

Results in Table 4 show that the effect is still present for the population falling into “capabilities poverty”. However, the estimation in Table 5 show no effect when we consider the population falling into “assets poverty”.

Table 4. Effect of market concentration on “capabilities poverty”

	Capabilities Poverty		
	(1)	(2)	(3)
hhi_hat	0.100*	0.056***	0.066***
	(0.031)	(0.030)	(0.035)
logptotal	-0.027	-0.006	-0.009
	(0.017)	(0.020)	(0.021)
Proportion of rural pop in mun	-0.119*	-0.116*	-0.115*
	(0.017)	(0.017)	(0.019)
Literacy rate	0.146*	0.290*	0.321*
	(0.055)	(0.060)	(0.070)
Log Median income	-0.445*	-0.445*	-0.439*
	(0.008)	(0.008)	(0.008)
Log of per capita public expenditure	0.005	-0.006	-0.008
	(0.004)	(0.006)	(0.007)
Share of pop>12 in manufactures sector		-0.002*	-0.002*
		(0.000)	(0.000)
Share of pop>12 in primary sector		-0.001	-0.000
		(0.000)	(0.000)
roadnetw			0.000***
			(0.000)
_cons	4.946*	4.783*	4.729*
	(0.180)	(0.220)	(0.235)
Number of observations	4,147	3,448	2,996
Adjusted R2	0.807	0.787	0.779

note: \* p<0.01, \*\* p<0.05, \*\*\* p<0.1

Table 5. Effect of market concentration on “assets poverty”

	Assets Poverty		
	(1)	(2)	(3)
hhi_hat	0.040 (0.033)	0.012 (0.030)	0.011 (0.036)
logptotal	0.033*** (0.019)	-0.007 (0.017)	-0.019 (0.017)
Proportion of rural pop in mun	-0.200* (0.011)	-0.210* (0.010)	-0.210* (0.012)
Literacy rate	0.258* (0.059)	0.172* (0.061)	0.201* (0.074)
Log Median income	-0.424* (0.009)	-0.454* (0.007)	-0.463* (0.008)
Log of per capita public expenditure	0.010** (0.004)	-0.004 (0.005)	-0.006 (0.006)
Share of pop>12 in manufactures sector		0.002* (0.000)	0.002* (0.000)
Share of pop>12 in primary sector		0.001** (0.000)	0.001** (0.000)
roadnetw			0.000* (0.000)
_cons	4.325* (0.200)	5.115* (0.178)	5.298* (0.188)
Number of observations	4,147	3,448	2,996
Adjusted R2	0.825	0.852	0.851

note: \* p<0.01, \*\* p<0.05, \*\*\* p<0.1

These results support the hypothesis that the poor are hurt by prices of essential goods and services and therefore concentration in the retail industry affects those with restriction to purchase food and basic goods.

In order to check the robustness of the estimated effects, we additionally perform a falsification test and estimate our basic model but using the HHI in the manufacture industry. Should concentration in the manufacture sector have an effect of poverty it would question the argument of the prices of essential goods and services as the mechanism of influence of market concentration on poverty. Table 6 shows no effect and provides additional evidence for the hypothesis in the theoretical predictions by Rodriguez-Castelan (2011).

It is important to note that the correlation of the market concentration measure with its lagged value is also present in the manufacture industry as shown in Column 1.



Table 6. Falsification test. Effect of concentration in the manufactures industry on poverty

[Insert HERE Table 6]

***The potential effects on poverty through employment***

This section considers the potential effect of concentration on poverty via impact in employment. We found no evidence of such an effect on employment in the retail sector (Table 7).

Table 7. Effects of concentration on employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
nd Employment Retail	OLS	OLS w/ controls	OLS w/ controls	FE	FE w/ controls	FE w/ controls	FE w/ controls
nd HHI in retail Sector	0.00249 (0.00358)	0.00308 (0.00357)	0.00794 (0.00521)	0.00575 (0.00460)	0.00568 (0.00460)	0.0052197 (0.00633)	0.00598 (0.00669)
nd Employment All Sectors ex Retail		0.01977* (0.01184)	0.00712* (0.00429)		0.00956 (0.00742)	0.04594*** (0.01712)	0.04911** (0.01964)
Log of total population			0.01721 (0.01258)			0.52763 (0.95863)	0.92204 (0.91283)
Proportion of rural pop in mun			-0.02564** (0.01240)			-0.46339 (0.33313)	-0.44906 (0.32179)
Literacy rate			0.06586 (0.04299)			1.77936 (1.24839)	4.97843 (3.32741)
Log Median income			- 0.68560*** (0.17627)			-0.35259 (0.45348)	-0.41505 (0.50225)
Log of per capita public			-0.04278			-0.10226	0.10512

expenditure			(0.05891)		(0.13103)	(0.15578)	
Share of pop>12 in manufactures sector			0.13602***	-	-0.02980*	0.01718**	-
			(0.04451)		(0.01584)	(0.00798)	
Share of pop>12 in primary sector			-0.00001		-0.01827*	0.01013	
			(0.00217)		(0.00945)	(0.01902)	
Constant	0.472***	0.460***	2.613***	0.469***	0.463***	-0.096	-9.079
	(0.016)	(0.014)	(0.465)	(0.002)	(0.004)	(11.392)	(8.434)
Observations	4,744	4,732	3,446	4,744	4,732	3,447	3,447
R-squared	-0.000	0.002	0.031	-0.000	0.000	0.007	0.011
Mun / Time FE	No/No	No/No	No/Yes	Yes/No	Yes/No	Yes/No	Yes/Yes

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5 Conclusions

In this paper we investigate the link between market concentration and poverty using data for Mexico. We combine the data from poverty maps with the municipality-level measure of concentration, the Herfindahl-Hirschman Index (HHI), in the retailing industry and control variables to construct a panel dataset of 2,372 municipalities covering the period 1990 to 2010.

Results suggest that an increase of one standard deviation in the market concentration, measured through the Herfindahl-Hirschman Index, implies an increase of 1 to 1.5 percentage points in the poverty headcount measured by the FGT0 using the food poverty line. These results support the hypothesis that the poor are hurt by prices of essential goods and services and therefore concentration in the retail industry affects those with restriction to purchase food and basic goods. The magnitude of the effect is non-trivial. Oportunidades, the emblematic conditional cash transfers program in Mexico is responsible of an estimated reduction of two percentage points in poverty (measured with the food poverty line). This implies that concentration in the retail market actually erases between 50 and 75 percent of the reduction effect of Oportunidades on the poverty headcount in Mexico.

Preliminary analysis of heterogeneity shows that the effect is concentrated in municipalities where the majority of population works outside the primary sector.

Previous evidence shows that consumers are harmed by elevated prices arising from limited competition, however few research works have tried to answer what are the effects on poverty. Our results contribute to the study of the supply conditions in poor localities and the estimation of its effects on poverty.

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