Supermarket Entry and its effect on small stores in Montevideo, 1998 to 2007

Fernando Borraz
Daniel Ferrés
Juan Dubra
Leandro Zipitría
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Fernando Borraz*, Juan Dubra**, Daniel Ferrés*** and Leandro Zipiría****

Abstract

We analyze the effect of supermarket entry on small grocery retailers’ exit in the retailing sector in Montevideo between 1998 and 2007. We show that the entry of one supermarket in a small store’s neighborhood increases its chance exiting the market in that year by 1.2% on average. The result is robust to several model specifications, and varying definitions of what constitutes a supermarket.

Keywords: Supermarket, small grocery, entry
JEL codes: L13, L21
1 Introduction

In the last thirty years large supermarkets have changed the retail business landscape around the world. Larger store formats, more shelf space and variety of goods and services, longer shopping hours and extensive marketing strategies have changed traditional retailing. This trend has increased the competitive pressure on smaller stores, that used to have “monopolistic” characteristics within their neighborhoods. Even though supermarkets are relatively novel in developing countries they are growing at steady peace. As a result, small retailers and producers, have increased the political pressure in order to mitigate the effects of large supermarkets upon them (see Reardon and Hopkins (2006)).

In order to evaluate different policy alternatives, it is imperative that the effect of supermarket entry on small retailers is correctly quantified. In this paper we do precisely that. Of course, other studies have documented the effect of large scale stores on small retailers’ sales or probability of survival in other countries, but those studies are not applicable in Uruguay. First, those studies are mostly for developed countries, where the scales and sizes of stores are much larger than in Uruguay. Second, entry and exit are the consequence of certain variables (population density, income, etc), that assume different values in different countries. It is possible that varying the levels of the independent variables (most importantly, income) affects the net effect of supermarket entry on small firms’ business conditions. Finally, there are cultural and country specific variables and regulations that could have an effect on the estimates that one obtains. For example, any supermarket of more than 200 square meters must undergo an administrative procedure with the government, and is subject to special approval. The result of this regulation is that chains of stores of less than 200 m$^2$ (with prices and service similar to those of large supermarkets) have entered in many neighborhoods of Montevideo, competing aggressively with small single store retailers. The effect of this kind of competition can not be assessed with the results of previous papers for other

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1 As an example, at the time of this writing, Uruguayan small retailers are again pressing to pass a law that seeks to tighten existing regulations to open large supermarkets. Interestingly, one can also view this demand for regulation as a consequence of lobbying efforts by incumbent supermarkets who want decreased competition (see our estimations in Section 7). See Stigler (1971) for an exposition of regulatory capture.
countries. One of the reasons for the inapplicability of results from other countries is that the definition of supermarkets in other countries tends to be much larger (say, larger than 2,000 m²); therefore, chains of supermarkets are not “forced” to open stores of less than 200 m², as in Uruguay).

Our estimates indicate that the entry of one supermarket in a small store’s neighborhood increases its chance of going out of business in that year by 1.2% on average. This result is robust to several alternative definitions of what constitutes a supermarket, and to different model specifications.

2 An overview of supermarket entry

A useful way of thinking about what has determined the entry of large scale supermarkets in the world in general and in Uruguay in particular, is through supply and demand.

The main changes on the demand side occurred in Europe and the US in the mid-seventies and a couple of decades later, in Latin America. Changes in demand are related to economic factors, but also to sociological and demographical events: (i) urbanization; (ii) entry of women into the workforce outside home, with increasing opportunity cost of their time so that they go in for both shopping convenience and processed foods to save cooking time (see Rodriguez et al., 2002); (iii) rapid growth in real mean per capita income. For example: income growth, wider credit, and a sharp fall in the prices of refrigerators prompted a more widespread use of larger refrigerators, that allowed the storing of perishables for a week or two rather than the day-to-day market habits of the past. Also, growing access to cars by the middle- and middle-low-income classes favored the expansion of supermarkets into additional market segments.

On the supply side, trade liberalization since the early 1980s made it easier and cheaper to import food and non-food products, which implied economies of scope (it became possible and profitable to hold inventories of many goods, giving an advantage to supermarkets over small stores). This led to a surge of FDI in retailing in a number of Latin American countries. In 2001-2002, multinational firms accounted for more than 50% of supermarket sales, in countries like
Mexico, Argentina, Colombia, Costa Rica and Guatemala, according to Readon and Berdegué (2002). Chile and Uruguay are rare exceptions to multinalization in the supermarket industry in Latin America.

Retailers are the intermediaries that link producers and consumers in the distribution chain. As Spulber (1999) has stressed, they do not just make goods available for consumers. For example, in some circumstances they serve to mitigate transaction costs or to pool and diversify risk (intermediaries holding inventories reduce the risks associated with fluctuating supply and demand). They also serve to lessen the problems of asymmetric information: a retailer with a good reputation serves as an implicit guarantee for the products it carries, avoiding the market breakups associated with lemons problems. Finally, when intermediaries can commit to certain pricing policies that are not available on direct exchanges, the market can gain in efficiency. When retailers were relatively small, classic industrial organization models were used to understand competition in the market. As retailers started to grow in size, classical models needed to be adapted in order to capture their different nature and complexities. As retailers continue to grow and expand worldwide, societies and antitrust agencies are increasingly concerned about their growing bargaining power, or their consequences on key socio-economic variables.

There are several commonly expressed concerns about large retailers:

i- the effect of seemingly tougher competition upon smaller competitors that force them to leave the market, and lead to industry concentration;

ii- the effect of retailers on aggregate industry employment;

iii- their increasing bargaining power with their suppliers -buyer power-, which allows them to lower input prices;

iv- the effects of large retailers on consumer product and service prices;

v- the destruction of the social and economic role that small retail plays within a specific local area. There are issues of livelihood and identities of neighborhoods that are important beyond the survival of specific firms.

Our study will concentrate on the first concern, although we acknowledge that all of them are related.
In Uruguay the origins of the local family-owned supermarkets can be traced to the 1950s. A large wave of multinationalization and concentration occurred in the second half of the 1990s. In 1998, The Exxel Group acquired Supermercados Devoto, and Supermercados Disco entered into a joint-venture with Casino, a French supermarket. In 2000, Disco-Casino bought Supermercados Devoto from The Exxel Group.² Both multinational entry and consolidation created a reaction from small retailers in Uruguay who lobbied in order to restrict entry, and forward the sector's demands more generally. In 1999, the small retailers associations succeeded in their lobbying effort to regulate the installation of large retailers in Uruguay.³

In 1999 the legislature passed a law that created regional commissions, one for each of the nineteen provinces in Uruguay, integrated by four representatives: one from the Executive Power, one designated by the local government, one representing consumers, and one representing small groceries.⁴ All entry by retailers with more than 300 square meters of sales area, or expansions of existing ones that exceeded this threshold, should submit a study to the Commission in order to get approval from it. In 2003 the law was amended and the threshold decreased to 200 square meters of sales area. Interestingly, this Commission has no power to single-handedly block entry of a supermarket; its recommendations need not be followed; its main duty is to inform the local executive branch (the “Intendente”) who decides whether to allow entry or not. As a result, the local government can change the decision of the Commission although usually at a high political cost.⁵ The Commission has to assess the effect of entry on: a) global supply and demand in the area defined by the local government (mainly to define whether there is excess demand by consumers, which is not being satisfied by incumbent firms); b) small retailers’ exit; c) net employment (the clause about having to consider the consequences on employment was introduced in 2003). Because the first law regulating supermarket entry was approved at the start of our period of

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² In 1999 the Disco-Casino joint venture opened Geant, the largest supermarket in Uruguay. Geant has an area of 16,000 squared meters -11,000 squared meters of commercial area- and 64 cash registers.

³ One year later, an antitrust law was also passed mainly to control abuse of dominance. In the very first years, the only cases submitted to the antitrust agency were alleged predatory pricing practices from large supermarkets, mainly Geant.

⁴ If the vote in the Commission is tied, the representative of the Executive gets a tie breaking vote.

⁵ What has happened in the past if the Commission rejected an application (by an incumbent who was undergoing expansions), the Intendente just did not issue any orders, and the retailer could continue to operate with the completed expansion. While this strategy has worked for small retailers, larger supermarkets do not start construction until they get approval from local governments.
analysis, and because consolidation and mergers happened also at the beginning of our period of analysis, we are unable to study the effect of the law, or of consolidation, on change in the pattern of supermarket entry. Some interesting questions that we are unable to answer are, for example:

1) did supermarkets change their entry strategy after the law was passed?;
2) was the effect of entry on small stores’ probability of survival different after the regulation was passed?;
3) did consolidation of supermarket chains affect the probability of survival of small stores? For example, if consolidation had led to higher prices, this would have increased the probability of survival of small grocery shops.

We did not extend the period of analysis to years before 1998, from which we could have gotten identification of the effects mentioned in 1-3 above because the quality of that data is dubious. Also, some identification of the effect of the law could have come from the change in “regulated size” from 300 to 200 square meters, but the data was not enough (too short a period and too few openings of sizes 200-300 between 1998 and 2003).

The laws regulating entry are common in Europe, but Uruguayan law has three distinguishing features. First, the threshold of square meters above which a store is considered a supermarket is much lower than their European counterparts. Second, the Commission has no veto power as the ultimate decision lies in the hands of the local government. Third, there is a representative of the central government in each Commission who can decide the result of the report.

The consequences of supermarket entry on small firms in Uruguay has been already studied by Dubra and Ferrés (2006). We improve on their data set, and on their estimation techniques.

3 Data

Uruguay is a small country located in south-eastern South America. It is home to 3.34 million people, of whom 1.7 million live in the capital Montevideo and its metropolitan area. The city is divided into 18 administrative regions called “Centro Comunales Zonales” (Common Zone Centers, CCZ). We “identify” these administrative regions with “neighborhoods”: each of these zones
corresponds to the union of several of the traditional neighborhoods in the city. Since Montevideo has an area of 525 square kilometers, CCZs have an average area of 29 square kilometers, or a square of 53 city blocks in each side. Although these regions are fairly large (when considered as neighborhoods), most of the “action” in each CCZ is concentrated in a much smaller area, since a few of the CCZs contain “rural areas”. These are land extensions that, by local regulations, can’t be split into plots of less than 3 hectares (a square of 5 city blocks on each side). Hence, these are very sparsely populated areas, where there are very few small stores, or supermarkets.

The foregoing description of the administrative division of Montevideo is relevant, because our estimation strategy regresses (basically) the probability of survival of a store as a function of the number of supermarkets in that CCZ. We are therefore assuming that the probability of survival of stores in a given CCZ is affected by supermarkets in that CCZ, but not by large stores in other CCZs. This assumption is based on a few interviews with supermarket owners, and consultants, and relies on the fact that most people in Montevideo go to the supermarket walking. The following Table shows that 72% of the people in Montevideo did their shopping walking, in the year 2000.

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Small Grocery Store</th>
<th>Supermarket (3 to 6 cashiers)</th>
<th>Supermarket (6+ cashiers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>72</td>
<td>94</td>
<td>71</td>
<td>58</td>
</tr>
<tr>
<td>By bus</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Car</td>
<td>21</td>
<td>2</td>
<td>18</td>
<td>33</td>
</tr>
<tr>
<td>Other</td>
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<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Non response</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
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3.1- Data bases

We collected 6 different data bases. The first, is from the “Servicio de Regulación Alimentaria” (SRA) of The Intendencia Municipal de Montevideo (IMM), the executive branch of the province’s
government (home of the “Intendente”). SRA is the municipal competent authority in charge of keeping a record of all food businesses, and of controlling their sanitary condition. SRA establishes definitions; sets standards for management and personnel, food operations, and equipment and facilities; it handles inspections and suspensions in order to safeguard public health and provide consumers food that is safe, unadulterated, and honestly presented. The base tells, for every year between 1998 and 2007, which stores dealing with food were open. All data about “small businesses” comes from this data base; the rest of the data bases concern data and definitions about supermarkets.

The second data base, is from the “Instituto Nacional de Carne” (INAC, the meat regulatory body). Every food business in Montevideo is required to hold a SRA permission to start operations, with the exception of butchers who need permission from the INAC. As will be discussed shortly, we used 4 alternative definitions of what constitutes a supermarket, and one of these definitions uses data about supermarkets that comes from the INAC data base. The INAC issues permits that are valid for two years. The data base from INAC contains two types of data: one is the list of permits for super markets, and another is the list for small butcheries. Unfortunately, we do not have the “Centro Comunal Zonal” or CCZ for each of the small butchers, and we could not get it from the IMM in time to process the information for inclusion in this study. As a consequence, our universe of small stores that compete with supermarkets excludes butchers.6

The third and fourth data bases are about supermarket size, purchased from Ciudata, and IDRetail (the supermarket union, Asociación de Supermercados kindly shared this data base with us), two local consulting firms. They include information about size in square meters, and number of cashiers. The data from IDRetail was collected in 2005 and the data from Ciudata was surveyed in 2008. We encountered some differences in the observations present in each database. In the case of large scale supermarkets, some differences reported were relatively high. In order to assess a quality evaluation of each data sources, we interviewed with both staff members from IDRetail and Ciudata. An important observation is that in the case of IDRetail, the information

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6 Although this is a shortcoming of the present study, the results we obtain are not biased: our results are in terms of how much the entry of a supermarket increases the chance of a grocery store going bankrupt. If one wants to assess the impact of supermarkets on the whole universe of small food stores, one has to include butcheries on the list of small stores.
related to the large supermarket chains operating in Montevideo (see section 3.3) was reported by Asociación de Supermercados del Uruguay (Uruguayan Supermarket Association; ASU), the commercial chamber integrated by the majority of the supermarket chains operating in Uruguay (with the exception of Tienda Inglesa). So, in the case of large-chain supermarkets, we used information provided by ID Retail (ASU, in the end). In the case of smaller supermarkets, we used information provided by Ciudata. We found that the Ciudata database contained information for a larger number of supermarkets than the IDRetail database. Additionally, for small supermarkets, differences in area information were less significant than for the case of large scale chain supermarkets. Data about number of cashiers is based on information obtained from Ciudata.

Our fifth data base is from “trade commission” (Dirección General de Comercio, DGC) from the Ministry of Economy and Finance. DGC provides a public list of supermarkets that are required to report prices of a consumer goods basket, on a monthly basis. Each supermarket must submit their price levels to DGC if they have more than 3 cashiers or if they belong to a chain of supermarkets with four or more business units. This list of supermarkets will be one of our 4 alternative definitions of supermarket.

Finally, our sixth data base is the Encuesta Continua de Hogares (ECH, the national household survey). ECH is prepared by Instituto Nacional de Estadística (INE) and contains socioeconomic information at the individual and household level. In our econometric models we include information on each CCZ, in order to control for characteristics of “the market” which could influence the probability of survival of small stores (and that are not related to the entry of a supermarket). From the ECH we collected data about average income, wealth and population in each CCZ in each year. Care should be put when working with income data present in the ECH. It is well recognized that, in general, people tend to under report their income levels. Additionally, the information on population encountered in the ECH presents problems due to recent changes in the sampling procedures. In particular, the sample is not representative of the total population of Montevideo. We highlight these issues because in our regressions, some of the coefficients related to these variables have unexpected signs. We will discuss these issues and alternative interpretations of the problematic coefficients later.
3.2- Definitions of grocery stores and Supermarkets

When a store wants to open and asks the SRA for a permit, if awarded, it is valid for a 5-year period. Once the permit has expired the food business must renew it. Additionally, firms going out of business need to report the end of their operations to the SRA. Although firms going out of business rarely report it, there is almost 100% compliance with getting the permit; that is, all food businesses hold a permit from the SRA. We will describe in some detail later how we use this information to determine when a supermarket opens, and when a small store closes.

Each business unit, when asking for a permit, is classified in an *ad hoc* fashion by the SRA; it is assigned all “codes” that correspond. For example a supermarket would be assigned the codes corresponding to bakeries, fresh groceries, fish selling, etc. The data base from the SRA contains many businesses that do not compete with supermarkets (bars, fat processing plants, etc). Within this data base, our definition of “things that are supermarkets or compete with supermarkets” is any business that had amongst the codes assigned to it by the SRA one of the following: i- “small groceries”, which includes small groceries and vegetables and fruit sellers; ii- “bakeries” which includes a long list bakery (and related) sellers; iii- sellers of freshly manufactured pasta.

Within this list of stores arising from the SRA, we had to classify businesses in “small” or “supermarkets”. For each of the 4 definitions of supermarket, the complement (within the SRA list) is the universe of “small stores”.

The 4 definitions of supermarkets we used were the following.

i) Whether a store had more than 200 square meters of sales space. This definition is consistent with the law on what is a supermarket. The data comes from IDRetail and Ciudata.

ii) Whether the store had 3 or more cashiers (source IDRetail and Ciudata).

iii) Whether the store is in the list of supermarkets that have to report prices to DGC (the fifth data base mentioned above)

iv) Whether the store has a butcher shop and sells other food products (source INAC).
Tables 1 and 2 present the correlations between the alternative definitions of supermarkets. We first collected all stores that are classified as supermarkets according to at least one definition. Then, we counted, according to definition i, for i = 1,…,4, how many supermarkets were in that CCZ in that year; and called the total T_i. Table 1 presents the correlations between T_1, T_2, T_3 and T_4.

<table>
<thead>
<tr>
<th>Correlation Coefficients between Different Definitions of Supermarkets</th>
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<tbody>
<tr>
<td>Bigger than 200 square meters</td>
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<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.91</td>
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<tr>
<td>0.85</td>
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</table>

Then, for each store that is classified at least once as a supermarket, we looked up its size on the IDRetail and Cuidata bases. Then, we added up, according to definition i, for i = 1,…,4, how many square meters of supermarket area there were in that CCZ in that year; and called the total S_i. Table 1 presents the correlations between S_1, S_2, S_3 and S_4.

<table>
<thead>
<tr>
<th>Correlation Coefficients between the Square Meters of Different Definitions of Supermarkets</th>
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<tbody>
<tr>
<td>Bigger than 200 square meters</td>
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<tr>
<td>-------------------------------------</td>
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<tr>
<td>1</td>
</tr>
<tr>
<td>0.99</td>
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<td>0.93</td>
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</table>

3.3 Data Processing

The SRA provided five files in xls format: i- Companies, list of active companies; ii- Annulled, list of annulled companies, which are currently not active; iii- Line of Business, list of the main line of business, defined in an ad hoc basis, iv- Street codes, list of codes in order to locate stores; v-
Complexes, list of housing projects (that do not have street numbers, and where some stores are located). There are 8,871 active companies, and annulled and inactive companies are 16,944.

In the first place, all establishments operating in line of business that do not compete with supermarket services were eliminated from the list of active and annulled companies. We were particularly interested in the following areas: groceries, bakeries, pasta and kiosks. The data base shows for each store: i- Main line of business (bakery, grocery store, fish market, etc); ii-Nº of procedure (the number that the SRC assigns to each request of a permit); iii- Street code (each street has a code, and for each store, the street code is the code of the street in which it is located); iv- Street number; v- Complex address (if the store is located in a housing project, the address of the store is just the name of the project in which it is located); vi- Centro Comunal Zonal (CCZ, this information was obtained from the data base processed by Dubra and Ferres, 2006); vii- Opening dates (registration, authorization and renewal dates); viii-Closing dates (registration, authorization, renewal dates and annulment dates).

In the second place, we generated a dummy variable, where 0 stands for the years in which the company was not active or closed, and 1 for the years in which it was active in the market. This was done following criteria about the date of registration, authorization, renewal and annulment, as in Dubra and Ferres (2006).

In third place, all the companies considered in the list of annulled companies that remained closed and then reopened, were discarded from the list of annulled companies, modifying the corresponding dummy in the list of active companies. Lastly, all the companies that were never active in the period considered were discarded. For completeness, some details about when a company was considered active follow (nothing is lost by skipping the next paragraph).

From the list of active businesses, we deleted all those that should have renewed their permits before December of 1997, but did not. We assume that these stores were closed before the start of our study (379 were deleted in this stage). We then eliminated approximately 2,500 stores that had opened more than 5 years before January of 1998, and had no renewal dates (we assume that they were not active at that date). Those stores that opened between 1993 and 2002, but had no date of renewal of their permits, were imputed a closing date of 5 years after their opening. Finally,
we “merged” all stores that had opened and closed on the same location. For the purposes of this study, we do not care whether the ownership of a store changed during the period, only if it closed.

4 Supermarket Entry in Montevideo

Montevideo with its suburbs is the largest commercial region of the country. Some other important commercial zones are: Punta del Este (Maldonado), Paysandú, Salto and Colonia. Consumption and shopping habits differ across the country. The urban population is very different from the rural one mainly due to income and cultural disparities. Both idiosyncratic and economic reasons explain why small family-owned shopkeepers are so popular in specific metropolitan and urban areas. On the other hand, data shows that large retail chains dominate in the middle and high income metropolitan areas. Supermarket chains are mainly concentrated in Montevideo, Punta del Este, and other coastal areas. There has not been yet a significant expansion to the rest of the country, with the exception of the chain store Ta-Ta.

In Uruguay, the main supermarket chains are: Grupo Disco del Uruguay (Disco, Géant and Devoto), Tienda Inglesa, Ta-Ta, Multiahorro, El Dorado, and Norte-Sur. Both Disco and Tienda Inglesa have the largest presence and they target consumers with higher purchasing power.\(^7\) Concentration, transformation and entry in the supermarket industry characterized the late 1990s, but that trend was slowed by the 2001-2002 financial and economic crisis in Uruguay. As a consequence, there was less market concentration in favor of smaller supermarkets and grocery stores, which provide proximity (for more frequent shopping as consumers were unable to afford weekly or monthly purchases) and often credit to its habitual customers. Traditional grocery stores underwent a significant change in order to maintain their presence in the market: they incorporated new products, especially those of less expensive brands, to attract price-oriented consumers. Also, some smaller supermarkets and grocery stores joined into buying consortia in order to have a stronger negotiating power (organized by CAMBADU). After the crisis, the strategy of buying in

\(^7\) Although Disco is somewhat less expensive than Tienda Inglesa, its location choices and marketing strategies are indeed targeted to the upper end of the income spectrum in Montevideo.
clubs or consortia continued, and it is likely that this has resulted in lower prices than would otherwise prevail today.8

As economic activity and growth resumed in 2003, supermarkets gradually regained market share and consumers returned to first brands. Supermarkets have the largest variety and product diversification focusing primarily on the middle and higher income strata. In the middle-late nineties, supermarkets accounted for approximately 35-40 percent of the country's total food sales, which was not as high as in other countries in the region where their share exceeds 70 percent. The balance was in the hands of smaller traditional grocery stores. Supermarkets’ market shares have approached the 50% levels in recent years, however. The reasons for this change are varied and have not been studied in depth, but some recent developments that may have contributed are: the rise in income after the crisis, and some poverty alleviation policies like the Emergency Plan and its main component, the Citizen Income Plan.9

5 Methodology

In this paper we explore the impact of supermarket entry on small retailing activity by exploiting differential entry of supermarkets (and differential "death rates" for small businesses) in 18 urban areas of Montevideo. We calculate for each of the 18 areas (CCZs) how many supermarkets entered each year, and how many small businesses perished on that year, and we ran a panel data estimation with that information. Our approach will allow us to identify specific effects for each CCZ. Studies for other countries define much larger geographical areas, such as cities or counties in USA. As supermarkets in Uruguay tend to be small by international standards, and because shopping habits (walking to the shop) “preclude” supermarkets from competing with small businesses far away, it makes sense to define smaller geographical areas. Moreover, since the law in Uruguay discusses supermarkets as entities larger than 200 m², it makes sense to see the effect

8   Our interest has not been on prices charged. Still, an interesting data base showing prices of goods by store can be found in http://www.dgc-mef.gub.uy/consultas/almacen/canastas/mensual/).
9   See Manacorda, Miguel and Vigorito (2009) and Borraz and Gonzalez (2008a and 2008b) and the references therein for a discussion of the plans and their impact.
these stores have on nearby stores (and not in the city in general). Our strategy of analyzing smaller geographical areas also allows us to better identify the effect of supermarket entry.

Of course, the strategy of analyzing "neighborhoods" of Montevideo makes sense only if there is differential entry across regions. Table 3 below shows that this is indeed the case. It presents for the initial and final years of our sample the number of supermarkets and the number of square meters of supermarket area in each of the 18 CCZs. It presents this data for two of our four definitions of supermarket (first, defining a supermarket as any store larger than 200 m², and then the data if we define supermarket as any store with three or more cash registers). Importantly, the table also presents population and income for each of the CCZs. It is relevant to keep the income and population variation in mind, because the interpretation of the coefficients will be influenced by this evolution.

The first thing to note is that although there has been an increase in the number of supermarkets, and their total area, this increase was not large: the number of supermarkets has increased around 23%-25% in a decade. Also, note that average household income fell in real terms between '98 and '07. Still supermarket entry (that is generally associated with rising incomes) occurred in part because: inequality rose during the period (Borraz and Gonzalez, 2009), so the income of higher deciles rose, prompting entry; higher availability of cars, and of freezers; female entry into the workforce, that increased the opportunity cost of time intensive shopping (associated with the smaller stores).
In our work, the dependent variable is if the grocery was active. Therefore, we will estimate the grocery survival probabilities. In particular, we estimated the following non linear panel data:

\[ \Pr[a_i = 1] = F[\alpha_i + X_{it} \beta + S_{it} \delta + \gamma DG_{it} + \lambda_i] \quad i = 1, 2, \ldots, 9622 \quad t = 1998, \ldots, 2007 \]

where

- \( a_i \) is a dummy variable that takes a value of 1 if the grocery “i” was active at time “t”;
- \( F \) is the logistic function (logit model) or normal function (probit model);
- \( \alpha_i \) is the unobservable characteristics of grocery i (management ability, for example);
- \( X_{it} \) are demand control variables such as average per capita income, at the household level, for the CCZ in which grocery i is located on each period of time; also we control for the CCZ population;
- \( S_{it} \) represents the existence of supermarkets in CCZ where the grocery i is located. This variable was defined in two ways: i) as the number of large supermarkets installed in the CCZ where grocery i is located and ii) as the sum of squared meters of supermarkets in the CCZ where grocery i is located;
- DG<sub>t,i</sub> is a dummy variable to account for the installation of the biggest supermarket in Uruguay in 1999 (Geant, 11,000 square meters);
- λ<sub>i</sub> captures a time-effect

We estimated a panel logit model using the conditional maximum likelihood estimator as suggested by Chamberlain (1980). A natural consequence of this method of estimation is that we will employ only the observations for groceries that were open at some point, and then closed during the sample period. Therefore we will lose information on 1,923 groceries that were open at the beginning of the period and did not change status. As robustness checks for our estimations, we ran 24 different regressions, in a 2x3x4 design: 2 independent variables (number of supermarkets in a given CCZ in a given year or number of square meters of supermarket area in a given CCZ in a given year), 3 methods of estimation (logit random and fixed effects and probit random effects), and 4 definitions of supermarket (larger than 200 m², 3+ registers, the definition of the DGC, and the definition of INAC concerning butcher shops inside the store).

With respect to the control variables, we would like to emphasize that we attempted to include other control variables indicating the household’s durable goods ownership, as a measure of wealth. For example, an extensive literature shows that the availability of cars, refrigerators and freezers favor the existence of consuming habits that tend to increase supermarket consumption (see Reardon and Berdegue (2002) and the references therein for a discussion of these issues). In the case of Montevideo, for the time horizon under study, we found an almost 1-to-1 correlation between per capita income (at the household level) and the availability of specific durable goods. So, we understand that the income variable captures the “availability of specific durable goods” effect.

A fundamental aspect of our econometric work was to control for the unobserved characteristics of groceries to avoid specification bias. The models for cross statistical data typically ignore individual differences and treat the aggregate of the individual effect and the unobserved characteristic as a pure chance event. In our study, we estimated a panel data using information about groceries through time. This allowed us to work with a model of individual
groceries’ behavior instead of a model of the average behavior of a group of groceries. The existence of the unobservable characteristics allows groceries that have similar characteristics to have different predicted probability of closure. The unobservable characteristics could be interpreted as management skills for running the business.

7 Effects of supermarket entry

We first review the effect of entry on the probability of survival of small stores, and then comment on the literature’s findings concerning each effect we document.

6.1 Effect on small stores’ probability of survival

Tables 4, 5 and 6 present the estimation results of the panel logit (fixed and random effects) and probit. In each case, the dependent variable is whether small grocery store i was open at time t; the independent variables always include demand factors (population and income); for the left panels, the independent variables include how many square meters of supermarket area there were in the CCZ of store i, in period t; for the right panels, the independent variables include how many supermarkets there were in the CCZ of store i, in period t.

Results indicate that the probability of survival of small retailers decreases as the number of supermarkets, or their total area supermarket, increases in each CCZ. Estimations are robust to the four definitions of supermarkets that we considered (more than 200 square meters; three or more cashiers; supermarkets as defined by DGC; stores that sell groceries and have a butcher). Moreover, the negative relationship between the number of supermarkets, or the supermarket commercial area, in a CCZ and the probability of survival of small grocery firms is statistically significant at the 1% level for most of the 24 regressions.

This result is consistent with what we expected, and although we will discuss the magnitude of this effect shortly, a word of caution is in order: the effects we estimated are in all likelihood a lower
bound for the “harm” that supermarket entry can inflict on small stores. The reason is that supermarket entry (that we are taking implicitly as exogenous in our regressions) is most certainly the consequence of calculated decisions by supermarket owners. In that respect, there may be variables that cause both supermarket entry and that simultaneously make the survival of small stores more likely. Imagine, for example, that some neighborhood switches from being an office area to being a residential area: that will prompt supermarkets to enter, and will simultaneously improve business conditions for small grocery stores. In this case, if we observe that when supermarkets enter, small businesses increase their chance of failure by 1%, it means that supermarkets reversed the positive variables that had caused the supermarket to enter and that had favored the small stores, and that in addition, entry harmed small stores. Maybe, in the absence of supermarket entry, the chance of survival of small stores would have been much higher than the 1% that our regression suggests.

This endogeneity of supermarket entry is also relevant for the interpretation of the coefficients on income and population. Regarding population, the coefficients are usually negative, but often not statistically significantly different from 0. The negative sign means that an increase in the population of a CCZ leads to a decrease in the probability of survival of smaller firms, which is fairly counterintuitive. This finding may be due to at least two different causes. The first, is that the data on population is not very accurate (as was mentioned before). The second, and possibly more relevant possible cause, is that if the population in a neighborhood will rise, that may prompt supermarkets to enter, and this leads to the closing of small stores. Regarding income, it has the expected sign in Tables 5 and 6, but a negative sign (although insignificant) in Table 4. As in the case of population, the negative sign in some regressions could be interpreted as endogeneity of the entry decision of supermarkets.

The regressions in Tables 4, 5 and 6 include a dummy variable per year. We find a positive and significant decaying time effect between 1998 and 2002. After this, and until 2007, the effect is still positive and decreasing, but not significantly different from 0. Our interpretation is that this

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10 We do not report the coefficients here, but the estimates are available from the authors upon request.
time effect captures the effects of the 2002 economic crisis. The probability of a grocery been open was higher before the crisis than after the crisis.

Finally, the models in Tables 4, 5 and 6 also include a dummy variable corresponding to the opening of Geant. Strictly speaking, Geant is not in Montevideo, but is very close to its border, and it certainly competes with stores in the capital. The variable assumes the value of 1 only in years in

<table>
<thead>
<tr>
<th>Table 4: Panel Logit Fixed Effects with Time Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Supermarket</td>
</tr>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Household p/capita Income</td>
</tr>
<tr>
<td>Dummy Geant</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
</tr>
</tbody>
</table>

*For all Tables, standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%
which it was open, and for the CCZ that is closest to Geant. The coefficient is positive, indicating that the opening of that supermarket made the survival of small stores more likely. This counterintuitive finding may have a few alternative interpretations. It could be again that Geant entered the market when conditions were favorable. Another possible interpretation is that the opening of Geant favored the creation of some “satellite” stores that benefited from its opening. It is also possible that the opening of Geant prompted a change in the business model of some stores that resulted in their becoming more profitable. For example, a store that would otherwise sell “average quality” products, could specialize in high end products to complement the supply of Geant. We do not know which factor is the true explanation, and we do not have the data that would be able to distinguish among these potential explanations.

The following table presents a summary of the main results of this paper. Table 7 presents by how much the entry of a supermarket affects the probability that a small grocery store will close. The table shows, depending on which of the 4 definitions of supermarket one uses, the entry of a supermarket reduces the chances of survival of a small store by something between 0.8% and 1.5%. Similarly, the estimation establishes that the opening of 1000 m$^2$ of new supermarket area in a given CCZ reduces the chances of survival of a store by something between 1.2% and 1.6%. This second set of numbers (based on the opening on 1000 m$^2$, and not on the opening of 1 new supermarket) is somewhat larger because the average size of a supermarket is smaller than 1000 m$^2$. In all cases, the coefficient measures how entry changes the probability of survival in the year of entry. In order to see whether entry of a supermarket in 2000 reduced the chance of survival for year 2001 for stores in the same CCZ, for example, we ran the same set of regressions with the number of square meters lagged one and two years, and found no effect. The most obvious interpretation is that all (or most) of the effect of entry is absorbed by small stores in the year of entry. However, another explanation for the result may be that the lagged effect, or long run effect, is relatively small and our data on shop closings is too coarse to capture it.
The results of Table 7 are the summary of 8 of our regressions, all based on a panel logit fixed effects model. Similar results emerge from the other two models (logit random effects and probit random effects). As was argued earlier, due to the endogeneity of entry decisions, these estimates can be considered as a lower bound to the effect of supermarket entry on small businesses chances of survival.

In an alternative set of models, we attempted to capture some size effects. For example, is the opening of 5 supermarkets of 250 m² the same as the opening of one of 1250 m²? In order to address this question, we included as an independent variable the sum of the squares of the square meters of the supermarkets in each CCZ in each year. Tables 8 to 10 show that the new variable is positive and significant.
### Table 8: Panel Logit Fixed Effects with Time Effects

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>&gt; 200 m²</th>
<th>3+ registers</th>
<th>DGC</th>
<th>Butcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarket</td>
<td>-0.000194 (4.95e-05)**</td>
<td>-0.000187 (5.72e-05)**</td>
<td>-0.000144 (5.55e-05)**</td>
<td>-9.84e-05 (1.64e-05)**</td>
</tr>
<tr>
<td>Supermarket Squared</td>
<td>1.65e-07 (5.61e-08)**</td>
<td>1.49e-07 (6.04e-08)**</td>
<td>1.18e-07 (6.11e-08)*</td>
<td>1.28e-08 (3.37e-09)**</td>
</tr>
<tr>
<td>Population</td>
<td>-3.71e-06 (1.88e-06)**</td>
<td>-4.13e-06 (1.89e-06)**</td>
<td>-4.02e-06 (1.89e-06)**</td>
<td>-3.14e-06 (1.88e-06)*</td>
</tr>
<tr>
<td>Household Per Capita Income</td>
<td>-1.78e-05 (2.86e-05)</td>
<td>-1.19e-07 (2.80e-05)</td>
<td>-7.92e-06 (2.85e-05)</td>
<td>-2.72e-05 (2.84e-05)</td>
</tr>
<tr>
<td>Dummy Geant</td>
<td>(6.324)**</td>
<td>(6.750)**</td>
<td>(6.859)*</td>
<td>(0.348)</td>
</tr>
<tr>
<td>Observations</td>
<td>76.990</td>
<td>76.990</td>
<td>76.990</td>
<td>76.990</td>
</tr>
</tbody>
</table>

Standard errors in parentheses:
* significant at 10%; ** significant at 5%; *** significant at 1%

### Table 9: Panel Logit Random Effects with Time Effects

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>&gt; 200 m²</th>
<th>3+ registers</th>
<th>DGC</th>
<th>Butcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarket</td>
<td>-2.51e-05 (9.55e-06)**</td>
<td>-2.35e-05 (1.01e-05)**</td>
<td>-2.26e-05 (1.03e-05)**</td>
<td>-5.53e-05 (1.11e-05)**</td>
</tr>
<tr>
<td>Supermarket Squared</td>
<td>4.00e-09 (2.13e-09)*</td>
<td>3.32e-09 (2.11e-09)</td>
<td>3.47e-09 (2.16e-09)</td>
<td>7.00e-09 (2.07e-09)**</td>
</tr>
<tr>
<td>Population</td>
<td>-1.12e-06 (8.67e-07)</td>
<td>-1.18e-06 (8.73e-07)</td>
<td>-1.22e-06 (8.76e-07)</td>
<td>-3.37e-07 (8.58e-07)</td>
</tr>
<tr>
<td>Household Per Capita Income</td>
<td>4.27e-05 (8.18e-07)</td>
<td>4.03e-05 (8.19e-07)</td>
<td>4.06e-05 (8.19e-07)</td>
<td>5.52e-05 (8.19e-07)</td>
</tr>
<tr>
<td>Dummy Geant</td>
<td>(1.28e-05)**</td>
<td>(1.28e-05)**</td>
<td>(1.33e-05)**</td>
<td>(1.19e-05)**</td>
</tr>
<tr>
<td>Observations</td>
<td>96.220</td>
<td>96.220</td>
<td>96.220</td>
<td>96.220</td>
</tr>
</tbody>
</table>

### Table 10: Panel Probit Random Effects with Time Effects

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>&gt; 200 m²</th>
<th>3+ registers</th>
<th>DGC</th>
<th>Butcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarket</td>
<td>-1.48e-05 (5.51e-06)**</td>
<td>-1.38e-05 (5.79e-06)**</td>
<td>-1.33e-05 (5.95e-06)**</td>
<td>-3.27e-05 (6.34e-06)**</td>
</tr>
<tr>
<td>Supermarket Squared</td>
<td>2.27e-09 (1.23e-09)*</td>
<td>2.31e-09 (7.78e-10)**</td>
<td>1.97e-09 (1.25e-09)</td>
<td>4.23e-09 (1.19e-09)**</td>
</tr>
<tr>
<td>Population</td>
<td>-6.18e-07 (5.00e-07)</td>
<td>-6.55e-07 (5.03e-07)</td>
<td>-6.75e-07 (5.05e-07)</td>
<td>-1.71e-07 (4.94e-07)</td>
</tr>
<tr>
<td>Household Per Capita Income</td>
<td>2.50e-05 (7.38e-06)**</td>
<td>2.35e-05 (7.40e-06)**</td>
<td>2.38e-05 (7.66e-06)**</td>
<td>3.25e-05 (6.86e-06)**</td>
</tr>
<tr>
<td>Dummy Geant</td>
<td>0.0262 (0.141)</td>
<td>0.0702 (0.141)</td>
<td>0.0491 (0.140)</td>
<td>-0.0122 (0.126)</td>
</tr>
<tr>
<td>Observations</td>
<td>96.220</td>
<td>96.220</td>
<td>96.220</td>
<td>96.220</td>
</tr>
</tbody>
</table>

Standard errors in parentheses:
* significant at 10%; ** significant at 5%; *** significant at 1%
The coefficient on the sum of the squares of the square meters of each supermarket in each CCZ is positive and often significantly different from 0. This means that the relationship between groceries and supermarkets eventually becomes positive, meaning to say that if a large enough supermarket enters, this would generate positive business for small stores. Based on the calculation of the marginal effects the break-even point (small supermarkets are bad for small stores, large supermarkets are good; a supermarket of the break even size is neutral) is around 1,200 square meters. Since only 3 CCZs had openings of supermarkets larger than that, the estimation means that supermarkets were rarely beneficial for small stores, but that larger supermarkets were “less bad” than smaller ones.

Our interpretation of the result that larger supermarkets are less harmful than smaller ones for grocery stores is as follows. Given the usual way in which people in Montevideo do their shopping (walking), the penetration strategy of supermarkets has usually been through the sprawling of smaller sized stores locating in many places, close to the consumer. Given this strategy, it is the small supermarkets that hurt small grocery stores the most, by locating close to consumers.

Two notes are in order about the result that large supermarkets don’t hurt small stores as much as smaller supermarkets. First, this is in line with the findings of Sadun (2008). This evidence seems to show that groceries compete more directly with small supermarkets rather than larger ones. As supermarkets grow bigger, then they seem to compete with each other and less likely with small groceries. Second, the analysis of Competition Commission (2008) also shows milder effects of large supermarkets entry for small groceries’ revenues, than middle ones (see Table 3 Annex A4(3)-6). The entry effect of a big supermarket (with more than 4,000 square meters) on small groceries is about two times the effect of the entry of another small grocery store (between 280 and 1,400 square meters). But the entry of a middle sized supermarket (between 1,400 and 4,000 square meters) has an impact on revenues three times bigger on small grocery shops than the effect of the entry of a grocery of similar size. It should be noted that every entry has an impact on small groceries’ revenues. In this case, the effect on revenues is larger with medium size supermarkets, rather than with larger supermarkets.
We now briefly review the literature on entry and exit of stores for other countries, in order to put our results in context. We then discuss the evidence on how supermarket entry affects small stores.

6.2 Retail industry and the effect of supermarket entry; a short review

Jarmin, Klimek, and Miranda (2005) study the evolution of the U.S. retail sector (defined by SIC codes from 52 to 59)\(^\text{11}\) for the period 1976 to 2000. They report that 70.4% of all retail sales in 1948 were accounted by single location stores, but this figure sharply decreases to 39% by 1997. Larger retailers -those with more than 100 establishments- increased their share of sales from 12.3% to 36.9% in the period. In the same line, retail employment increased nearly 175% between 1958 and 2000, but the number of retail establishments increased by just 17%. It should be noted that even small single location stores increase their average employment over the period, mainly because employment remains constant and the number of stores decreased. Also, the average number of small single location store per capita fell during that period (from 7.44 to 5.88), but chain stores increased from 1.32 to 1.76 stores per capita over the same period.

Retailing has distinctive characteristics regarding entry and exit. Small groceries have the largest entry and exit rates resulting in net exit in the period 1976 to 2000. Also, the larger the chain store the lower its entry and exit rates. This result holds for different geographic markets; eg. metropolitan area or rural area. But small firms are more numerous -on a per capita base- in rural areas. Of course, this is a natural consequence of higher population densities in cities; Montevideo is not an exception, and as was noted earlier, supermarket penetration has been larger in Montevideo than in the rest of the country. Firm turnover (sum of entry and exit rates) is larger the larger the market size, defined by Jarmin, Klimek, and Miranda (2005) as rural, micropolitan and metropolitan areas.

\(^{11}\) SIC Codes: 52: Building Materials and Hardware; 53: General Merchandise; 54: Food Stores; 55: Auto Dealers & Gas Stations; 56: Apparel and Accessories; 57: Home Furnishing & Equipment; 58: Eating and Drinking Places; 59. Miscellaneous Retail. Supermarkets, as traditionally defined are classified in SIC Code 53.
In a previous paper Jarmin, Klimek, and Miranda (2003) specifically study patterns of entry and exit from all the retail industry for the period 1977 to 1997, using as a benchmark the study of Dunne, Roberts, and Samuelson (1988) for the U.S. manufacturing industry. Although they find similar patterns for both industries, they did document some differences that worth mentioning. First, they found a downward trend in both entry and exit over the period. Second, they found that multi establishment retailers nearly doubled the number of establishment run by multi-unit manufacturers in 1977. This difference between the retailing and manufacturing industries grew over the period they considered. Third, entry and exit rates are larger in retailing than in the manufacturing sector. Relatedly, newcomers and firms that exit the market explain a larger proportion of employment creation and destruction in retailing than in the manufacturing sector.

Although we have not focused on average lifetime of grocery stores, our data can be used for that purpose. Regarding survival of grocery stores, and the comparison with the manufacturing sector, Jarmin, Klimek, and Miranda (2003) also find similarities: in both industries, “death rates” are similar; from a given cohort, on average, 40% survive 5 years and just 18% 10 years. Surviving firms grow at a faster rate in terms of employment, as they became larger. There is also a sharp difference between the growth of expanding firms and the rest; the first ones enter the market with nearly three times the average employment, but the second ones just half. Lastly, surviving expanding firms are 20 times larger than average firms after ten years of entry, but the remaining entering firms are just 10% larger than the average firm.

Haskel and Sadun (2005) describe the retail sector in UK in 2003. At the supermarket sector (Sector 521. Non-specialized) they were 35,418 firms and 54,678 stores. Single stores -groceries- account for 97.4% of total firms, employ 3.75 workers on average, and account for 10.6% of sector employment. On the other extreme, 37 firms have more than 100 stores (0.1% of total firms), which employ 25,332 workers on average and they represent 77.2% of sector employment. Concentration figures are the largest for the supermarket industry, with a $C_5$ of 49.60, compared to 22.03 for the average retail industry. Upon entry, in 2002, entrants account for 9.8% of the total number of firms, but for local units this figure rises to 14.66% (in 2001). On the other hand, firms that exit the market account for 18.47% of total firms, and 12.96% of local units. These figures
suggest that entrants may be mainly firms that are not single store ones, but the ones that exit the market are mainly single store firms.

Whether the exit of small stores is the consequence of entry of larger supermarkets is a highly disputed matter. The first question one could ask is if entry of large stores increases concentration. Franklin (2001) found little effect of Wal-Mart Supercenters on food seller concentration in major metropolitan areas between 1993 and 1999. This study, however, is belied by the fact that Wal-Mart enters mainly small towns, and only recently into metropolitan areas; of the 100 metropolitan areas in US, Wal-Mart was operating only in 54 of them in 1999. Also, its market shares were relatively low at that time; the maximum was found in Mobile, Alabama with a market share of 16.3%. Expanding the scope of the analysis presents a different picture. Martens, Dooley, and Kim (2006) add non-metropolitan areas to the analysis, and study the period from 1999 to 2003. They found Wal-Mart stores increase concentration in local markets, and although the concentration impact of each store is somewhat small, because Wal-Mart opens several stores per city, the cumulative impact of those openings could be non negligible.

A second question of interest is: beyond the impact of entry on concentration, what are the consequences for small stores? Sobel and Dean (2008) studies the impact of Wal-Mart on all small retailers, and shows that there is no long-run impact of Wal-Mart on them. They do find a reallocation effect on the small business sector as a result of Wal-Mart entry; some sectors expand while others contract. This study takes into account all small retail establishment, defined as those up to 4 employees for the overall retail sector. On the other hand, Jia (2008) shows that just the entry Wal-Mart from late 1980s to late 1990s explains 37% to 55% of the net change in small retailers, defined at the 52 SIC Code (that is, those which compete directly with supermarkets), in small- and medium-sized US counties. She also finds that when either Wal-Mart or Kmart enter a market they make 46% to 58% of discount stores either unprofitable or unable to recover their sunk cost. When both enter a market this figure rises to 68.4%, or 3.07 stores per county. A similar finding for the UK was established by Competition Commission (2008), that also shows (as one would expect) that the effect of entry on groceries depends on the size of the entrant and the distance between both retailers.
Basker (2005), using different instruments than those used by Jia (2008) to account for the endogeneity of Wal-Mart’s entry decision, also finds a reduction in the number of small retailers - with fewer than 20 employees. After one Wal-Mart enters the market three retailers leave it within 2 years of entry, and up to four within 5 years (however, see also Gould, Pashigian, and Prendergast (2005), who show the positive effect of large supermarkets on small shops in shopping malls). For Italy, Viviano (2008) finds that entry by large supermarkets leads to a decrease in the number of small shops. The study also shows that higher competition, represented by lesser entry regulation, leads to an increase in the average size of firms.

Sadun (2008) studies the regulation of the retail market in the UK and paradoxically finds that, although initially designed to protect independent retailers, it results in a larger exit rate of small stores. This is interpreted as a consequence of the strategy of large supermarkets to eschew the regulation: they entered markets in a smaller format that competes more aggressively with small stores. We argued earlier that our regressions can be interpreted in a similar manner: entry by smaller supermarkets is more harmful than entry by larger stores.

8 Concluding Remarks

This paper analyzes the effect of supermarket entry on small grocery retailers exit in Montevideo. Dubra and Ferrés (2006) is the only prior attempt to study the effect of supermarket entry on small retailers. Uruguay, and Montevideo city in particular, is a good case study because supermarket penetration is still rather low (compared to other Latin American countries) and because there is continuous political discussion over the overall effects of supermarket entry but limited empirical evidence.

Using several data sets for Montevideo we study the effects of entry of large retailers on the exit decision of small convenience stores. Information on small grocery firms’ activity in Montevideo, is based on a database generated by Servicio de Regulación Alimentaria (SRA, the

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12 Griffith and Harmgart (2008) finds that entry regulation has a negative impact on the number of large stores, but that this effect could be overstated if demographic variables are not taken into account.
sanitary office of Montevideo’s municipal government). We focus on the 1998-2007 period, a time interval characterized by concentration (and some entry) in the supermarket industry in Montevideo. We perform the analysis at the CCZ level, which allows us to disentangle the effects of supermarkets opening at a more detailed level that a city-level study would allow.

We estimated a panel logit model using the conditional maximum likelihood estimator as suggested by Chamberlain (1980). The dependent variable was a dummy variable indicating whether the small retailing firm was open for business or not. Independent variables include two definitions of supermarket activity (in each regression, only one definition is used). One identifies the number of supermarket installed in each CCZ. The other supermarket definition indicated the sum of the supermarkets’ commercial areas installed in each CCZ. In our study, we use four definitions of supermarkets: stores with commercial areas of more than 200 square meters; facilities that have more than three cashiers; supermarkets as defined by DGC (used in a consumer-goods prices survey conducted on a monthly basis by the Ministry of Economy and Finance); and grocery stores that also have a butcher. Independent variables also include demand related variables. In particular, we control for the population in each CCZ and per capita income (at the household level) for each CCZ.

Results indicate that the probability of survival of small retailers decreases as the supermarket commercial areas increases in each CCZ. In the same line, the survival probability is negatively related to the number of supermarkets installed in each CCZ.

It is important to note that the scope of this study is limited, in the sense that we did not try to analyze the effect of supermarket entry generally, but only its effect on small stores’ exit. There are many interesting issues that we have left unaddressed; we now briefly discuss three, productivity, prices (and consumer welfare more generally) and employment.

Foster, Haltiwanger, and Krizan (2002) study retail productivity in the US between 1987 and 1997 for the whole sector and show that nearly all of the productivity growth in the retail industry over the 1990s is due to more productive entering establishments that displace less productive ones. Their study shows the importance of entry and exit in explaining birth and death rates of stores across quintiles of productivity within the sector, although exit is concentrated in the quintile
of with the lowest productivity. Also, smaller firms (1 to 4 employees) have much higher entry and exit rates than larger ones, with entrants explaining as much as 96% of job creation and job destruction. In line with Jarmin, Klimek, and Miranda (2005) they find that small firms have a negative net employment growth, and larger stores a positive net job growth. There is also a high persistence of individual stores in terms of their productive ranking in the period. This survival difference across productivity of firms is a distinctive characteristic of retail as opposed to manufacturing sector. Of course, if supermarkets are more productive than small stores, one “should not” preclude their entry. Moreover, these studies find that entry of more efficient stores leads to a reallocation of labor across firms within the same retail industry, and this effect is the main explanation of the change in labor productivity. New firms explain more than 50% of job creation, and exiting firms account as much as to three quarters of the job destruction of total firms.

The effect of supermarket entry on productivity can be quite large. Foster, Haltiwanger, and Krizan (2002) find an overall growth of 11.43% for the whole sector, 18% for Department Stores and 23% for General Stores industries, for the ten year period in their study. For the sector as a whole this growth in productivity is explained mainly by entry. But for Department stores this growth in productivity is explained by net entry and by a reallocation effect between firms in the sector. They also show that net entry explains the reallocation of employment and output, mainly towards those firms that have higher productivity. For the UK, Haskel and Sadun (2005) advance the idea that the mayor slowdown in the retail sector as a whole could be due to the change in formats of the new entrants, which are much smaller due to entry restrictions. They show that productivity levels rise with firm size. Between 1998 and 2003 productivity rose just 0.14%, with net entry accounting for just 8% of this figure.

Another important aspect that we have left unaddressed is the positive effect of supermarket entry on prices. Bertrand and Kramarz (2002) report that food prices diminished when French zoning boards authorize more entry of supermarkets. Schiviardi and Viviano (2008) show that higher barriers to entry in retailing, expressed as lower admissible floor space in each Italian province, is associated with higher prices. They also find that higher barriers to entry entail larger profit margins and lower labor productivity. For the UK, Griffith and Harmgart (2008) also find that
barriers to entry in the retail market are associated with higher food prices, although their difference is rather small. As Haskel and Sadun (2005) point out, this could be due to the lower productivity of small supermarkets. For Chile, Lira, Rivero, and Vergara (2005) find that entry of large supermarkets leads to a decrease in prices of about 10% in a bundle of 52 food goods, and that this effect persists over time.

Lastly, we could not address properly the effect of supermarkets on employment. A brief review of the literature follows. Basker (2005) shows that Wal-Mart entry has a small positive effect on retail employment at the county level. In the year of entry employment grows by 100, but it shrinks to 50 jobs over the next five years. Neumark, Zhang, and Ciccarella (2005) review the results of Basker (2005) and using different instruments to account for the endogeneity of Wal-Mart entry decision find that each new Wal-Mart employee displaces 1.4 retail workers, which leads them to conclude that each new Wal-Mart reduce employment in the retail sector by 2.7 percent. This implies that employment has grown at a more modest rate than it would have if Wal-Mart had not entered the market. This result heavily relies on the instrument variables used, and has been questioned by Basker (2006). For Chile, Rivero and Vergara (2006) study the effect of supermarket entry in eleven Chilean regions and find that they have a positive effect on employment in the quarter entry occurs (up to 300), which in part disappears over the three years following entry but still results in a net increase in employment.
9 Acknowledgment

The authors gratefully acknowledge the financial support of International Development Research Centre (IDRC). This paper was prepared for the completion of the project “Consolidation and competition in the food retailing sector in Uruguay” funded by IDRC. We thank: the Intendencia Municipal de Montevideo for the main data base of this study; the Asociación de Supermercados and IDRetail for the data base on supermarket size; the INAC for the data base on butcher shops; and the economist Catalina Maissonave for her excellent, dedicated, and serious research assistance.
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