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ENTRY REGULATION IN RETAIL MARKETS

Abstract

We survey the empirical literature analyzing the consequences of entry regulation in retail industries. We begin by providing some background on the most common forms of entry regulation and their rationales. We use OECD data to show evidence of a general trend towards less stringent entry regulation in the past 15 years. However, substantial heterogeneity persists across countries. Next, we review a number of empirical contributions that analyze the effects of entry regulation on market outcomes. We compare studies relying on quasi-experimental variation in regulation to those based on structural models and comment on strengths and challenges of each approach. We summarize the results obtained by the literature with respect to several important outcomes that entry regulation can be expected to affect, such as market structure, entry, productivity and employment. We conclude presenting a few relevant topics that the literature has yet to address and, therefore, represent promising avenues for future research.

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1 Introduction

The importance of the retail trade sector both as fraction of employment and of GDP is a common trait across developed economies. Its relevance, though, extends beyond what can be measured with economic indicators. First, some of the goods traded in retail markets, food and drugs for example, are essential components of the consumption basket of every household. Second, retail establishments naturally tend to locate close to populated areas. Therefore, the development of such activities unavoidably impacts the quality of life of the neighboring population. Hence, it does not come as a surprise that national and local governments have actively tried to exercise control of retail activity in various forms.

In this survey, we provide an overview of the literature on the effects of entry regulation in retail markets. This topic is of paramount importance as in virtually all countries retail markets are affected by a certain degree of entry regulation and its impact can have multiple consequences. The breadth of the domains touched by regulatory activity in retail is well witnessed by the different fields of economics that have been concerned with it: the contributions we review fall in areas as diverse as industrial organization, labor economics, urban economics and public economics. Most of all, understanding the effect of entry regulation is an important goal because the legislation on the subject is continuously evolving. Therefore, new evidence can directly stimulate reform and guide policy.

We start by providing, in Section 2, some background on the trade-offs implied by the regulation of entry in retail and illustrate the most common types of entry regulation provisions. This brief introduction leads to three main conclusions. First, there are valid arguments to justify some degree of government intervention in retail. Second, the actual implementation of regulation can, due to inefficiencies and opportunistic behavior, deter entry above and beyond what would be optimal. Third, data show that countries are heterogeneous in how strictly they regulate entry in retail and that in recent years there have been several adjustments in legislation even within countries.

In Section 3, we survey empirical studies of the impact of entry regulation in retail on

several market outcomes. The focus is on empirical contributions since the theoretical framework to analyze regulation in retail markets does not substantially differ from that used to study the problem in other industries. Furthermore, this paper is only concerned with the regulation of entry; therefore, we do not survey the literature on the regulation of business practices (prices, business hours and vertical agreements).

The contributions we present follow two main methodological approaches. Some of them attempt to exploit quasi-experimental variation in the strictness of entry regulation across time or markets. The main challenge faced by these papers is obtaining a clean measure of intensity of entry regulation and a compelling source of exogenous variation for it. Other studies embed regulation in structural models of entry. This strategy allows researchers to run counterfactual experiments simulating alternative policy scenarios but requires additional assumptions on functional form, distribution of unobservables and the details of the entry game played by firms. Regardless of the methodological approach, the evidence we summarize, based on data from several different retail sectors, points to significant consequences of entry regulation for market structure, employment and productivity growth of the retail industry.

We conclude the paper presenting some challenges that, despite their relevance, have not yet been addressed by the literature. First, we know very little about the effects of entry regulation on non market outcomes (e.g. urban sprawl, liveliness of the neighborhood) which are an important part of the cost-benefit analysis on the implementation of regulation. Second, advances are called for in modeling the behavior of the regulator, which is currently taken as exogenous in the literature. Finally, since entry control is mainly exercised through permits and licensing for the construction of new buildings, it is important to understand how entry regulation is evolving as an increasing fraction of retail is carried on online, without the need of brick-and-mortar premises.

2 Background on entry regulation in retail

2.1 Why is entry regulated?

Entry restrictions reduce the degree of competition in a market, thus decreasing social welfare. In fact, protection from the threat of entry increases the incumbents' market power. Market power generates the classical static allocative inefficiency, in which prices are higher and quantities lower than in the competitive equilibrium. In addition to hurting consumers, this can also lower employment in the regulated sector. Lack of competition can also reduce product variety and lead to dynamic inefficiencies in the form of lower incentives to reduce costs, with adverse consequences on productivity.

The acknowledgment that regulating entry can have negative effects on welfare has inspired, in recent years, a policy movement across countries aimed at limiting such restrictions. This is particularly important for retail trade, a sector in which activity has been heavily regulated by governments around the world. For instance, the European Union Services Directive calls for the removal of obstacles to the freedom of establishment ensured under the Treaty of Rome.¹ Similarly, in the late 1990s, Japan significantly eased its control of entry in retail markets with the transition from the Large Scale Retail Store law to the Store Location law.

Even so, activity in retail trade is still regulated to some degree in nearly all countries. Why is this the case? Unlike manufacturing, retail trade usually takes place in populated areas or close to them, as proximity to customers is a key competitive factor. This leads to a series of concerns linked to how the opening of retail establishments may affect the quality of life of households living in the area which, in turn, provide reasons to control entry that are unique to retail markets. For example, the aforementioned Services Directive of the European Commission lists the protection of the urban environment among the reasons to override the general principle of freedom of establishment. This goal can translate into legislation restricting entry in order to prevent the negative effects of

¹ Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on Services in the Internal Market.

increased commercial activity on traffic or urban sprawl. Interestingly, even in cases when the objective is to promote retail activity in specific zones, policymakers have often decided to penalize entry on alternative sites, rather than providing incentives in the targeted areas. One such example is the Town Centre First planning policy established in the UK in 1996, which aims at ensuring the vitality of city centers. The law requires subjects applying for commercial developments outside of central areas to provide compelling evidence that their operation could not be located in a more central one, de facto creating a hurdle to entry in the suburbs.

Restrictions motivated by the desire to protect consumers' health and safety, which impose standards on the characteristics of both the place where the retail activity takes place and of goods and services traded, have a similar flavor. These reasons to control entry are not specific to retail trade but their stringency may be higher in this sector. For instance, the regulations imposed on new businesses in the retail food and restaurant industries are particularly stringent due to the importance of guaranteeing minimum safety standards in trades in which a substantial fraction of the population regularly engages.

The objective of preserving the quality of life of the population living in the proximity of new commercial developments has not only led to legislation discriminating between urban areas (e.g. peripheral vs. central neighborhoods) but also between types of retail outlets. In particular, the legislation regulating entry of retail establishments often contemplates special provisions for stores whose size exceeds certain thresholds based on the square footage dedicated to commercial activity. There is variation across countries both in how much stricter the requirements are for large stores and in how restrictive the definition of what represents a large store. This alone constitutes an additional barrier for large stores, which are often part of multinational chains and are forced to face different rules in different countries.

The special attention towards big box stores originates from the premise that, while providing consumers with the opportunity of saving money when shopping, their entry is also associated with a series of undesirable outcomes. First, entry of big stores typically takes place on the town outskirts, potentially leading to town centers desertification, urban sprawl, congestion etc. Moreover, they can crowd out small, independent stores, possibly reducing overall employment. This view is, however, still lacking strong empirical support.

While it has been documented that big chain stores are in part responsible for the crowding out of small neighborhood shops (Jia, 2008), this effect is much weaker and geographically limited in sectors, like groceries, where travel costs are important (Ellickson and Grieco, 2013). Furthermore, evidence on the overall effect on employment is, at best, inconclusive (Basker, 2005; Neumark et al., 2008). No direct indication exists of other adverse effects of entry by large stores on congestion, crime rates, or other indicators of the quality of life. Pope and Pope (forthcoming) show that the opening of a new Wal-Mart store raise the real estate price in the neighborhood, which suggests that such an event improves the attractiveness of the area.²

2.2 How is entry regulated?

In order to control entry, national governments can adopt provisions that fall into three main typologies. First, they can choose to exercise direct control on an activity or to grant (local) monopoly to selected players. Entry can also be prevented by requiring potential newcomers to comply with a series of rules, including registration procedures and fees. Finally, urban planning legislation can be used to single out areas where entry can be prohibited or subject to approval (zoning).

The instances where states are monopolists in a retail market are rare and limited to sectors that raise special concerns for public health and safety. The best known examples regard the sale of alcohol in Sweden and in several U.S. states. In such instances, the government perfectly controls not only the number but also the location and business practices of each store. In other cases, the state can grant a local monopoly or cap the number of store in a geographical area. In Italy, a new pharmacy cannot locate closer than 200 meters (one-eighth of a mile) from an existing one; in Belgium the maximum number of pharmacies allowed to open in a municipality is fixed depending on the size of its population.

The opening of a new retail establishment is typically conditioned to obtaining a series of authorizations. These involve assessments of the environmental impact of the construction

² For a review of the literature on the impact of Wal-Mart and other “big box” stores, see Carden and Courtemanche (2015).

of a new commercial site, of the safety of the workplace and of compliance with other state and local regulations. In addition, subjects willing to enter specific sectors, such as food retail, might need special authorizations to be allowed to do so.

Most of these requirements do not leave discretion to the examining authority; therefore, in principle, they could not be used to directly constrain the number of entrants. However, even in those cases, the complexity and length of these procedures and their lack of transparency and predictability may result in a cost of compliance, both in monetary and non-monetary terms, high enough to effectively discourage entry. In fact, usually different authorities (city council, fire department, etc.) are in charge of granting the permits forcing applicants to deal with multiple counterparts that adopt different procedures and standards. The presence of statutory periods that can be as long as a year and the uncertainty on the outcome of the process, due to lack of transparent procedures, are also factors significantly affecting the entry cost of new businesses.

Finally, the opening of a new commercial site has to comply with existing urban planning regulation through which national and local governments control the use of land. An often used tool to implement urban planning is zoning, that is the division of the town area in several pieces of land (zones) which are designed for a specific use. Zoning legislation allows either to forbid the establishment of commercial activities in certain areas or to limit it by requiring the approval of an examining authority.

Requirements and procedures to be granted approval vary widely not only across but also within countries as it is often the case that local boards are empowered to decide such matters within the framework of the national legislation. The burden they impose on applicants can be substantial. In Sweden, applicants are required to submit a market study documenting the impact of the new opening on existing businesses; in the UK, potential entrants must assess the effect of the proposed site development on local traffic and employment. Finally, the composition of the examining board can, in certain cases, include players with private interests to deter potential entry such as competitors.

2.3 Recent cross-country trends in retail entry regulation

From the discussion above it emerges that governments have a choice of instruments to control entry and significant discretion in how to implement them. As a consequence, comparing regulation across countries is problematic. To overcome this issue, the OECD has been compiling a series of comparable cross-country indexes on entry regulation in retail trade since 1998. The indexes are based on information on the specifics of national regulation provided by country experts as well as on questionnaires submitted to the main players in the retail sector in each country whose answers are aggregated into summary indexes via weighting statistical techniques.³

The information collected regards regulations that increase the cost of accessing retail markets (registration and licensing requirements) and provisions directly restricting entry (rules on the range of products and services that can be supplied, limits to the establishment of large outlets). The indicators also contain information on the extent to which incumbents are protected from new entry, either because they are granted legal monopoly rights or because they are involved in decisions concerning new licenses. The resulting information is aggregated into three indexes ranging from zero (least stringent) to six (most stringent):

- Licenses or permits needed to engage in commercial activity;
- Specific regulation of large outlet;
- Protection of existing firms.

We exploit the OECD indexes to provide an overview of recent cross country trends in the stringency of regulation. We compute an index of entry regulation as the simple average of the three OECD indicators and in Figure 1 contrast, for each country, the value of the index in 1998 with that 2013.

³ See Conway and Nicoletti, “Product Market Regulation in the Non-Manufacturing Sectors of OECD countries: Measurement and Highlights”, Economics Department Working Papers No. 530, 2006 for all the details on the construction of the indicators. See <http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm#indicators> to access indicators.

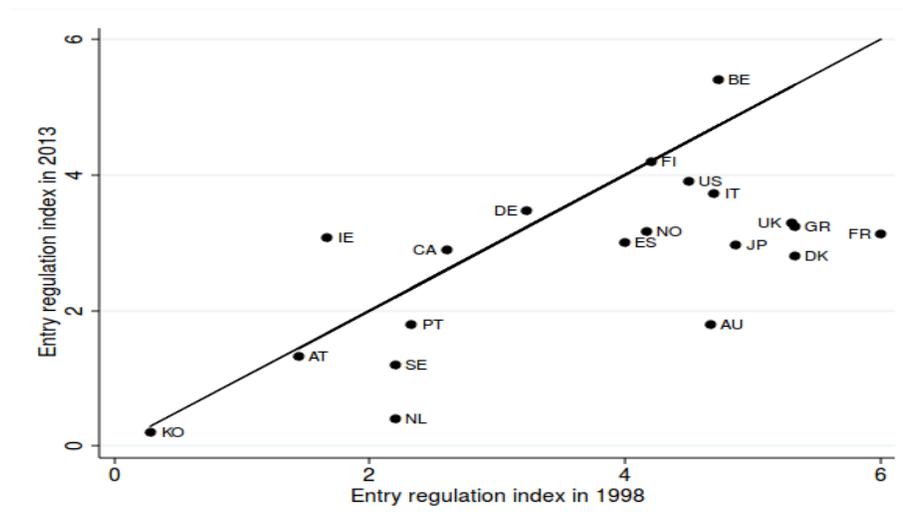


Figure 1: OECD indicator of entry regulation in retail 1998 vs. 2013

Note: The figure plots the value of the OECD indicator of entry regulation in retail (constructed as the average of the three sub-indicators commented in the text). Because of the data availability, for the United States the values on the x-axis and of the y-axis are those in 2003 and 2008, respectively.

Two main lessons emerge. First, as expected, we observe large dispersion across countries. In 2013 the index ranges from a minimum of 0.2 in Korea (the least regulated country) to a maximum of 5.4 in Belgium. Second, the comparison of the index in 1998 and 2013 shows substantial changes in the degree of regulation in many countries, confirming that entry regulation in retail is a current and relevant policy issue. Most countries recorded a decrease in regulation over this period, indicating the deregulation has been predominant. The largest changes are registered in Austria and France (-2.87), Denmark (-2.53), Greece (-2.10) and the UK (-2.00). Regulation has become tighter in Ireland, Belgium, Canada and Germany, although the absolute values of the changes are more modest.

Although tempting, exploiting the large cross-country differences in regulation to assess its economic impact is a challenging task, both because of the inevitable limitations of the index itself and because cross country comparisons are plagued by omitted variables bias, since countries are heterogeneous in unobserved dimensions. Exploiting within country changes in legislation seems a more promising approach to identify the true effect of entry regulation. Indeed, this is the path followed by the literature we review in the next section.

3 The effect of entry regulation on retail market outcomes

Policy decisions on regulatory activity involve trade-offs which are hard to evaluate purely on theoretical grounds. As we have seen, regulation is typically motivated by urban planning considerations, which should increase welfare. At the same time, it strengthens the market power of incumbent firms with possible adverse effects on competition. Ascertaining the magnitude of these effects is, therefore, key to inform policy makers.

Here we survey some recent studies that attempted to quantify the effect of regulatory activity in retail markets. The literature has developed significantly in the past fifteen years. We start by distinguishing between reduced form and structural approaches to this problem, highlighting strengths and limits of each. Next, we present a review of the results by market outcome.

3.1 Reduced form versus structural approaches

3.1.1 Reduced form studies

The reduced form literature measures the impact of regulation on market outcomes by regressing the variable of interest, be it the number of firms active in a market, prices, or employment, on an indicator capturing the strictness of regulation and additional controls. Recent studies typically rely on data from a single country, recognizing the difficulty of cleanly comparing regulation across countries. Identification is achieved following one of two main strategies. The first one takes advantage of sharp changes in entry regulation that affects only a subset of industries or geographical markets, allowing for a difference-in-differences estimation. The alternative is to use cross-market variation in strictness of the enforcement of the existing regulation. Instances of the first strategy are Kaplan et al. (2006) and Bruhn (2011) who exploit the staggered implementation across municipalities of a reform simplifying new businesses registration in Mexico. Bertrand and Kramarz (2002) and Sadun (forthcoming) are examples of the second strategy: the effect of regulation is identified by exploiting variation in the strictness of local planning authorities in regulating entry in France and the UK, respectively. Obviously, the two sources of variation can be combined. Viviano (2008) uses both a policy discontinuity represented by the introduction of a new law regulating the sector in Italy (the Bersani law) and the fact that local

authorities implemented its directives with different degrees of strictness.

These empirical approaches provide a clean and easy way to estimate the effects of entry regulation. The difference-in-differences identification strategy relies on policy changes that affect some markets (the treated group) but not others (the control group). The effect is then estimated by comparing outcomes in treated and control markets before and after the reform. Quasi-experimental variation induced by policy discontinuities represents a compelling source of identification. Unfortunately, such discontinuities are rare. On the other hand, the identification relying on cross-sectional differences in the strictness of regulation demands that we are able to build a reliable measure of regulation intensity, which is not a straightforward task. Bertrand and Kramarz (2002) use the share of applications for the opening of a new commercial establishment approved by a regional government (department) as an indicator of the strictness of enforcement. Maican and Orth (2015) and Cheshire et al. (2015) rely instead on the number of rejected applications to infer the tightness of entry regulation. This literature has extensively documented that large differences exist in the implementation of the same directives across local authorities, generating plenty of identifying variation. For instance, Bertrand and Kramarz (2002) report that average approval rates of applications for the opening of new establishments greatly differ across French departments, ranging from 10% to 70%.

One problem related to the use of these types of indicators is that they may be biased measures of the true strictness of entry regulation (Edwards and Edwards, 1974). In fact, knowledge that some regional boards are tougher than others may affect the number or the type of applicants, hence influencing approval rates and number of rejections. The direction of the bias cannot even be established *a priori*. On the one hand, tougher scrutiny can discourage applicants so that only the most likely to succeed apply for permits. On the other hand, in areas where entry is severely restricted, the payoff for those who enter is larger as they are shielded from competition by potential new entrants. Hence, more applications may be received in those markets than it would have been absent entry regulation. In the first case, the share of rejected applications underestimates the restrictiveness of entry regulation; in the second case, it overestimates it. Using the number, rather than the share, of rejected applications introduces an additional problem. Since a high number of denied applications may derive either from a strict enforcement of regulation or from a higher number of applicants, one must then control for the flow of

applications presented.

Alternative measures of regulation use laws prescribing caps for the number, the density or the square footage of commercial establishments that can be opened in a certain area. For instance, Schivardi and Viviano (2011) consider differences across regions in the maximum square footage of new large commercial establishment set by different Italian regions, adjusted for the market size. Similar limits exist in Belgium for the number of pharmacies, as reported by Schaumans and Verboven (2008). Finally, some studies try to measure of regulation intensity relying on survey interviews, as Suzuki (2013) who exploits the data presented in Gyourko et al. (2008) on regulation of residential buildings in the US.

Measurement concerns aside, a simple regression of the number of firms or of employment in a market on an indicator of entry regulation would only yield a consistent estimate of the effect of regulation under the assumption of exogeneity of regulation with respect to market conditions. This is clearly a major concern. For example, if local boards adjust their attitude towards applicants in response to shocks to demand or to the cost of doing business, which arguably also independently influence firms' entry and post-entry decisions, this assumption is violated. Bertrand and Kramarz (2002) develop an instrumental variable strategy that it is routinely followed in this literature. They instrument regulation with political preferences at the local level. The validity of this instrument hinges on the assumption that right wing politicians court the votes of small business owners, who fear the threat of big-box chains. Therefore, they are more likely to champion strict entry regulation than left wing elected officials. At the same time, the exclusion restriction requires that political preferences are uncorrelated with local market conditions in the retail sector.

Although the seriousness of the simultaneity bias must be evaluated on a case-by-case basis, results in Bertrand and Kramarz (2002) show that it can play a substantial role. Their estimates of the effect of regulation on retail employment grow by 50% moving from OLS to instrumental variables. At the same time, the use of local political preferences as an instrument, which has become something of a standard practice, should be used more cautiously. Seim and Waldfogel (2013) fail to find evidence that political affiliations within the Pennsylvania state assembly affect the decision of the state Liquor Control Board. Moreover, given the size of employment in retail trade, assuming that political outcomes

are independent from local conditions in this sector is debatable. This should spur research toward the identification of additional viable exogenous shifters of entry regulation.

A further concern of using cross-market variation in the strictness of local regulation in retail trade is that it might be proxying for other local economic policies that affect economic activity more generally. Bertrand and Kramarz (2002) propose a placebo test commonly used in subsequent papers. They check whether outcomes in sectors not subject to the regulation in retail but with similar characteristics in terms of technology and human capital are correlated with the measure of regulation in retail. Finding no correlation lends support to the conclusion that the adopted measure of regulation in retail trade is capturing an effect specific to that sector.

Finally, it is worth noting that virtually all the measures of regulation considered in the literature concern the approval stage. Since it takes time to build a new establishment once the application has been greenlighted, current market outcomes may depend on past, rather than current, regulation. This issue has received little attention, with the notable exception of Bertrand and Kramarz (2002) who allow for four years lags in the measure of regulation to take time to build into account.

3.1.2 Structural approaches

Another stream of contributions takes a different approach and studies the effect of regulation on market structure following in the footsteps of the tradition of the empirical estimation of entry games inaugurated by Bresnahan and Reiss (1991). Aguirregabiria and Suzuki (2015) provides an extensive discussion of entry games in retail industries; here we provide only a brief overview.

With respect to reduced form studies, the structural approach allows to directly retrieve estimates of entry cost and relate them to the presence of entry regulation, therefore providing valuable input for the cost-benefit analysis of regulation. Furthermore, retrieving structural parameters enables researchers to perform counterfactual experiments that are informative on the outcomes of policy scenarios alternative to those observed in the data.

On the downside, these models involve more assumptions than reduced form exercises and results can be quite sensitive to them. Moreover, the level of computational complexity of rich entry models can become quite burdensome. Finally, the estimation of an entry model would typically only allow to gauge the effect of regulation on entry decisions, that is on market structure. Other outcomes (e.g. employment, prices, etc.) can only be analyzed by adding additional structure to the model (modeling the hiring or pricing decision), increasing their complexity. Instead, descriptive study can readily encompass a number of different dependent variables of interest.

The structural literature attempts to infer the economic primitives that determine firms' entry decisions relying on data on the number of firms active in a cross-section of markets. This requires specifying functional forms for a revenue function and for variable as well as entry costs. Both can be modeled as function of observed as well as unobserved covariates. For instance, the revenue function can be shifted by market size (proxied by population), income and education of the local population. Operating and entry costs will depend on factors such as local wages and the value of land. Once the covariates affecting firm profits are determined, standard distributional assumptions allow modeling the number of firms observed in a market as an ordered probit and parameters of the revenue and cost functions can be estimated through maximum likelihood.

The effect of regulation can be easily integrated into this framework by including information on whether a certain market is subjected to entry regulation as a shifter in either variable or, more commonly, entry costs. This structure lends itself well to policy experiments. For instance, to infer what market configuration would have emerged in the absence of regulation, it suffices to simulate the model by lowering the cost structure of zoned markets to the level of otherwise identical markets where zoning regulation is not in place. Unlike the reduced form literature, which has labored over the issue of the endogeneity of regulation, this literature discusses but does not address the issue: regulation is simply assumed to be exogenous.

A relevant characteristic of most retail markets is the existence of both large multistore chains and of independent family owned businesses. Capturing the interaction between large and small retailers has important consequences for policy since, as we have seen, entry restrictions are often motivated by the goal of protecting independent retailers from

competition by chain stores. Consequently, a group of studies modified the standard Bresnahan and Reiss (1991) framework, which deals with homogeneous firms and models a market level outcome, along the lines of Mazzeo (2002) to allow for the interplay between the entry decisions of big box and independent retail stores (Griffith and Hargart, 2012) or for competing chains (Suzuki, 2013). These models can have multiple equilibria. Researchers have dealt with this issue with either timing assumptions or the specification or estimation of an equilibrium selection rule or by abandoning point identification of the parameters in favor of set identification.

Several other extensions of the basic entry game help tailor this setting to salient features of the retail industry. Nishida (2014) embeds zoning regulation in a model of network choice between multistore chains which captures the trade-off between exploiting economies of density by clustering store location and the resulting cost in terms of self-cannibalization. As in Jia (2008), the entry decision in a market is then correlated with the decisions taken by the same firm about entry in adjacent markets. This is a realistic feature of densely populated markets, which are those typically concerned with entry regulation. Another relevant characteristic of the retail sector is that it requires significant upfront investments, stressing the relevance of being able to separate fixed from sunk costs as they could be affected by regulation in a different way. Both Maican and Orth (2012) and Suzuki (2013) take this aspect into consideration by developing dynamic entry-exit models in the spirit of Pakes et al. (2007).

The literature reviewed so far models regulation as a shifter of the cost of entry in models where entry is free. An alternative approach (Schaumans and Verboven, 2008; Ferrari and Verboven, 2010) builds the entry restrictions directly into the model. These papers consider regulation in the opening of pharmacies that caps the number of establishments at a fixed number, depending on the population of the municipality. Incorporating this information into the game complicates inference. Observing that the cap is binding in a regulated market still implies that firms who entered make positive profits but it does not allow to infer that they would earn negative profits if one extra firm were to enter.

Finally, it is worth stressing that embedding information on regulation when estimating models of entry and market structure is useful even when learning about the effect of regulation is not the main goal of the study. Datta and Sudhir (2013) and Nishida (2015)

notice that ignoring the regulatory framework leads to an omitted variable bias that can severely affect the estimates of the determinants of entry decisions in a market and the direction of the bias is generally hard to predict.

3.2 The effect of regulation on market outcomes

After reviewing methodological approaches and challenges to study the role of entry restrictions, we turn our attention to the results obtained by the literature on the effects of such regulation on a set of relevant market outcomes.

3.2.1 Market structure and competition

Although the stated objectives of entry restrictions do not always explicitly mention market structure, firms' entry decisions and the resulting number and type of firms active in a market are the only variables that this type of regulation can influence directly. Introducing limits on the number of new entrants in a market will obviously reduce entry when the limits are binding. Even in the absence of strict limits, the mere introduction of an application process and a set of rules with which new entrants have to comply with may discourage entry by raising entry costs to the point that firms which would have considered opening an establishment in the absence of regulation decide not to do so. The effect of restrictions in a particular sector can propagate to related industries. Particularly fitting in this sense is the example provided by Schaumans and Verboven (2008). Given the complementarity between pharmacies and medical practices, legislation limiting the number of pharmacies in a municipality also impacts the number of physicians who set up a practice in the area, even though entry for them is not regulated.

Not surprisingly, the findings of this literature invariably confirm that regulation acts as an entry barrier that limits the number of firms active in a market. Bertrand and Kramarz (2002) report several indexes of concentration, all positively related to the strength of entry deterrence; Bruhn (2011) and Kaplan et al. (2012) show that a reform that decreased the cost and length of the procedure for registration of new businesses in Mexico raised the rate of entry in the industries involved.

Structural models of entry based on data from markets with entry restrictions provide a handy way to quantify the distortion of market outcomes imposed by the presence of regulation. In fact, they allow simulating counterfactual scenarios that are informative about what would have happened had entry regulation not been in place or had it been stricter. The lifting or tightening of regulation is usually mimicked by shifting up or down the estimates for the cost of entry. Datta and Sudhir (2013) use US data to show that introducing zoning regulation on 25% of the area of a market reduces the number of grocery stores by 50%. Nishida (2014) finds that eliminating entry restriction for Japanese convenience stores leads to increases of over 10% in the number of stores in the most restricted areas, where building commercial outlets is completely forbidden, and of 2–3% in areas where building an outlet requires permission from the local government. Schaumans and Verboven (2008) estimate that entry restrictions have reduced the number of pharmacies in Belgium by more than 50%, compared to an unregulated scenario.

The main reason to care about quantifying how market structure is affected by regulation is its link to competition. Entry regulation can be thought of as an entry barrier that discourages or prevents altogether entry in a market. As a result, the incumbents will be shielded from the threat of entry and enjoy higher market power. Several studies have tried to gather evidence of anticompetitive effects of regulation measuring the relationship between entry restrictions and equilibrium prices or margins. Using the price level to make inference about the degree of competitiveness of an industry is subject to the usual caveat that economic costs are typically unobserved to researchers. Hence, high prices may just reflect high costs and not necessarily higher market power. The analysis of prices in retail presents the additional challenge that it is often conducted using price indexes to account for the fact that retail stores are multiproduct businesses. One has then to be careful that differences in the price index across markets are not due to differences in the composition of the basket of goods offered. The increasing diffusion of scanner data, which document in detail sales at the barcode level, provides the opportunity for researchers to construct price indexes starting from the microdata and even to analyze prices at the product level, circumventing the issues associated with aggregation.

The evidence points to a positive relationship between prices and regulation, fueling the concerns that regulating entry may negatively affect competition, although the effect is not

very large. Bertrand and Kramarz (2002) report a modest elasticity of retail price indexes to the strictness of regulation. Griffith and Harmgart (2012) study prices at a more disaggregated level, looking separately at 109 grocery categories. Their findings confirm that prices are not hugely elastic to the degree of entry regulation: the price differential between a market in the 25th percentile of the distribution of the number of out-of-town retail developments and one in the 75th percentile is 1%.

One important point stressed by the structural analysis on this topic is that the conclusion on the nature of the positive correlation between prices and regulation crucially depends on whether we think that entry restrictions affect only the fixed entry cost or variable costs as well. Suzuki (2013) shows that hotels in regulated areas earn 4% higher revenues. However, estimated variable costs are higher too for those establishments. Therefore, producer surplus is actually decreasing in the strictness of regulation.

3.2.2 Location and store format

Geographic location is a relevant dimension in retail markets as it offers a chance to differentiate from competitors and soften price competition (Netz and Taylor, 2002). Entry regulation limits the degree to which retail establishments can differentiate in location, triggering their incentives to look for alternative ways to carve out market niches, such as store format or product assortment. Moreover, the imposition of restrictions only on selected areas of a market (e.g. downtowns or suburbs) or particular types of retail stores (e.g. establishments above a certain squared footage) also has an impact on the location choice and on the type of establishment a firm decides to set up in case of entry. For example, entry restrictions in suburban areas deter entry of big box outlets. In fact, these stores are defined by their ample floor space and can more easily open on town outskirts. Cheshire et al. (2015) report that the number of applications for major new retail developments fell significantly after the government introduced additional constraints on the opening of large stores in suburban areas in the mid-nineties in England.

A frequent goal of legislation regulating entry in retail markets, whether or not explicitly stated, is to tame the rise of large chain stores and protect small retail businesses. Griffith and Harmgart (2012) provide evidence that such targets can be effectively achieved with

the imposition of entry restrictions on suburban areas. These provisions impact the entry costs of large and small retail stores differently, and the magnitude of their effects is significant, both in terms of the number of large stores and of food prices. Datta and Sudhir (2013), however, show that in the grocery industry the possibility of choosing the characteristics of the store (supermarket store, convenience store, wholesale club, etc.) mitigates the entry deterrence effect of regulation. The tightening of regulation may fix the number of establishments while allowing their composition to adjust. In particular, favoring new establishments in city centers, where the geographic proximity is greatest, results in increased variety of the type of stores available. Regulation pushing new stores towards the suburbs instead leaves more scope for geographical differentiation and results in more homogeneity in observed store formats. To the extent that consumers have different preferences for different store formats, these adjustment can have relevant welfare implications.

Sadun (2014) points to the potential unintended consequences of regulation when entrants can modify their entry mode following a change in regulation. She notices that the Town Centre First regulation in the UK was explicitly aimed at both avoiding town center erosion and protecting independent retailers from the competition of large chains. To achieve these goals, Town Centre First increased the hurdles on out-of-town developments. Sadun finds that independent retailers were actually harmed by the regulation. In fact, large retail chains reacted to the increased costs of opening large out of town stores by entering with smaller, in town shops, which compete more directly with independent stores as substitution between same format stores is stronger than across formats (Datta and Sudhir, 2013).

Finally, regulating entry allows the legislator to control the geographic coverage of a market. On the one hand, regulation raises entry cost and can have a negative effect of geographical coverage. Schaumans and Verboven (2008) find that removing caps on the number of pharmacies at the municipality level implies a decline in markets within the municipality with no pharmacy from 242 to 145. On the other hand, regulation can help in offsetting the natural tendency of retail establishments to cluster in area of high demand (Pinske and Slade 1998). Seim and Waldfogel (2013) show that the state monopoly of liquor stores in Pennsylvania resulted in allocation of stores less prone to the bias against rural areas.

3.2.4 Productivity

Due to the large role that retail markets play in modern economies, productivity developments in the retail sector have sizable aggregate consequences. van Ark et al. (2003) attribute a large component of the gap in productivity growth between Europe and the US in the nineties to the differences in retail productivity. Since the two continents differ in their approach to regulating retail markets, with Europe having a more hands-on attitude, the relationship between retail entry regulation and productivity has been thoroughly investigated.

There are two main mechanisms through which entry regulation can affect productivity. First, by reducing potential competition from new entrants, it may diminish the incentives for the incumbents to engage in cost-reducing innovation. Second, it may indirectly affect productivity through an effect on store size by distorting the format choice of the new entrants. Larger stores are more efficient both because of economies of scale (Holmes, 2001) and scope (Basker et al., 2012). As we have seen, regulation can affect store format choice, influencing the number of large vs. small and medium stores active in the market and therefore impacting the productivity of the retail sector.

Unfortunately, studying productivity in the context of retail presents several challenges which have hampered our understanding of the subject. These challenges notwithstanding, the literature has been able to provide a picture that consistently links higher regulation with lower productivity. Cheshire et al. (2015) study the effects of Town Centre First regulation in England on TFP. They use a difference-in-differences estimator comparing productivity of stores of a same chain in England to that in Scotland and Northern Ireland, where entry regulation was less stringently implemented. They show that: a) large stores are more productive than small stores; b) the regulation has induced a reduction in store size. Their back-of-the-envelope calculation suggests that the implementation of such policy has caused at least a 9.6% loss in TFP. Haskel and Sadun (2013) study the effect of the same policy but approach it by modeling productivity at the chain level. In their framework, chain-level gross output is a function of labor, capital, intermediates as well as of the number of small and large stores controlled by the chain. Regulation can affect productivity indirectly by skewing the ratio of large to small stores. They assess that productivity growth in the food retail sector in the UK between 1997 and 2003 would have

been 0.44% per year in the absence of regulation, whereas the observed growth was only 0.07%. Schivardi and Viviano find a 5% effect on real sales per worker moving from the 25th to the 75th percentile in the distribution of entry regulation strictness across markets.

Maican and Orth (2015) model store productivity as an unobserved variable and retrieve it structurally, using the procedure introduced by Olley and Pakes (1996). They estimate a retail production function accounting for endogeneity of the inputs choice and use its residual to measure TFP. They extend the standard methodology to allow the exogenous process governing productivity to differ across markets according to the strictness of entry regulation. In their results, a one standard deviation change in the regulation index entails a 2 to 5% change in productivity at the market level.

Although the literature has extensively studied the link between entry restrictions and productivity, there is little evidence on the mechanism accounting for this relationship. An exception is Schivardi and Viviano (2011) who test whether higher entry barriers induced from tougher entry regulation affect the incentives of the incumbents to invest in ICT, a major source of productivity improvement in retail (Basker 2012, Basker forthcoming). They show that the probability of making any investment in software is adversely affected by the size of entry barriers.

3.2.5 Employment and wages

The sheer size of the workforce employed in the retail sector across modern economies begs the question of whether its regulation may have detrimental effects on employment. Bertrand and Kramarz (2002) list a series of reasons that can lead entry regulation to reduce employment. The most obvious one relates to competitive effects. More entry regulation means higher market power and fatter margins for incumbents. This results in businesses gaining higher profits by selling lower volumes and, therefore, requiring a smaller workforce to be run. On top of this direct effect, entry restrictions can prevent the creation of stores that have spillovers effect on the overall volume of retail trade, such as mall anchors (Pashigan and Gould, 1998).

The evidence confirms the prior that tougher entry regulation reduces employment in the retail sector. Bertand and Kramarz's (2002) results imply that the elasticity of employment

in retail to the stock of approved applications for the establishment of new stores is 0.1. Schivardi and Viviano (2011) find that a shift from the bottom to the top quartile of the distribution of regulation barriers is associated to a 5% growth in retail employment. Viviano (2008) also reports adverse effects of regulation on occupation in retail.

Theory predicts that regulation increases the rents in the industry. This may translate into higher wages, depending on the bargaining power of the employees (Blanchard and Giavazzi, 2003). The scant evidence existing in this respect is not conclusive. Bertand and Kramarz (2002) find no statistically significant effect of a more liberal regulation on wages. Schivardi and Viviano (2011) also fail to register significant effects of regulation on wages in the retail sector as a whole. However, they find that higher entry barriers are linked to higher wages for the subsample of medium and large firms.

4 Conclusions

In this survey we provided an overview of entry regulation in retail markets. We started with a taxonomy of the different types of regulation that impact entry in such markets, highlighting its rationale and supplying real world examples that have been used by researchers to study the effects of entry regulation. We then surveyed the recent empirical literature that attempts to quantify the role played by entry restriction in affecting market outcomes. We focused in particular on measures of competition, store format choice, productivity and employment.

Although we have made significant steps in the past fifteen years in furthering our understanding of the role of entry restrictions in several relevant domains, this literature is still underdeveloped, especially considering the importance of the retail sector in modern economies and the amount of regulatory activity in the industry.

A first area in which significant advances are called for is the quantification of the potential benefits of entry regulation for urban planning and the quality of city life. As we have seen, the introduction of regulation is often motivated by the desire of controlling congestion and pollution, preserving the livelihood of high streets and guaranteeing access to retail

services to a wider fraction of the population. These are desirable goals and are also important to achieving broader objectives that a harmonic development of urban areas can help ensure, such as controlling the growth of criminal activity. Since those outcomes are admittedly harder to quantify than employment or productivity, we know almost nothing on how effective regulation is in pursuing them and how much they are valued by citizens. We have shown that considerable evidence exists documenting the distortionary effect of regulating entry; on the other hand, we have little to show on how large the benefits may be. Basing welfare calculations on such an incomplete picture would lead to the naïve conclusion that entry regulation should be eliminated. In truth, the evidence available at the moment is insufficient to judge whether the degree of regulation we observe on a given market is excessive or insufficient. This seems a severe limitation that future research should try hard to overcome.

A second dimension in which significant progresses are called for is the handling of the regulation process. Whether its effect is measured through quasi-experimental variation or using structural model, the process leading to the introduction of regulation and the dynamics regulating the strictness of its enforcement represent a black box. The explicit introduction of the regulator as an active player, alongside firms and consumers, in entry-regulated markets will lead to more realistic models which are better suited to inform policy. A promising step in this direction has been taken by Schiraldi et al. (2012) who introduce the regulator as a player in the entry games between incumbents and new entrants and assume that it makes decisions about applications from new entrants with the objective of maximizing the sum of consumers' and producers' surplus.

Finally, a major trend in retail markets in the past fifteen years has been the constant rise of the share of trades performed online. The diffusion of e-commerce is linked to both the entry of new players in the industry (Goldmanis et al., 2010) and to the expansion of the operations of traditional firms to the new channel (Pozzi, 2013). Although this development has been so far ignored by the literature on the effect of entry regulation, its implications are potentially game changing. In fact, entry control is mainly exercised through the granting of building permits, which are not necessary for online businesses operating without brick-and-mortar premises. Whether the diffusion of online shopping will pose a challenge to the effectiveness of the control that national governments can exercise on retail markets is an interesting avenue for future research.

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