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Entry Barriers in Retail Trade

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Abstract

The 1998 reform of the Italian retail trade sector delegated the regulation of entry of large stores to the regional governments. We use the local variation in regulation to determine the effects of entry barriers on firms' performance for a representative sample of retailers. We address the endogeneity of entry barriers through local fixed effects and using political variables as instruments. We also control for differences in trends and for area-wide shocks. We find that entry barriers are associated with substantially larger profit margins and substantially lower productivity of incumbent firms. Liberalizing entry has a positive effect on investment in ICT. Finally, more stringent entry regulation leads to higher inflation: lower productivity coupled with larger margins results in higher consumer prices.

JEL classification: L5, L11, L81

Keywords: entry barriers, productivity growth, technology adoption, retail trade.

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1 Introduction

Liberalization is arguably the most strongly advocated policy for improving economic performance, particularly in many service activities, where legal barriers to competition are widespread. Indeed, there is a consensus that anti-competitive regulation is the main cause of the US-Europe difference in productivity growth in the service sector in the recent years.[1] There is a lively ongoing debate among policy-makers concerning whether and how service activities should be (de)regulated: for example, the European directive on services currently under review started with a very pro-market formulation but has become progressively less and less favorable to competition.

Notwithstanding the emphasis on liberalization policies, robust quantitative evidence on the effects of liberalization in services is still rather scant and often of an indirect nature. The effects of competition on performance are well documented in manufacturing, where it has been shown that trade liberalization leads to the reallocation of activity towards the most efficient firms (Melitz 2003, Bernard, Jensen & Schott 2006). This evidence is only suggestive of the importance of liberalization policies for the service industry: in fact, services are fundamentally different from manufacturing and much less subject to international competition.[2] Most of the studies that point to a positive effect of liberalization in services are based on cross-country comparisons with qualitative indicators of regulation (Nicoletti & Scarpetta 2003, van Ark, Monnikhof & Mulder 1999), which makes it difficult to quantify the cost of the barriers to competition. Moreover, cross-country studies are plagued by problems of omitted variables: for example, countries with more regulated product markets also tend to have more regulated labour and financial markets. They also face endogeneity and reverse causality issues: countries with low productivity firms might impose more stringent regulations to shelter them from competition.

We consider one sector in one country: retail trade in Italy. The case of Italy offers a good opportunity to study the effects of regulation, as we will be able to tackle many

[1] Already in the early 1990s, Baily (1993) claimed that the higher degree of liberalization is a major factor behind the higher labour productivity of services in the US. In particular, restrictions to competition "... can prevent the most efficient producers from entering an industry or from expanding. It can also slow down the diffusion of innovations and allow managers to operate with excess labour ...". Alesina, Ardagna, Nicoletti & Schiantarelli (2005) show that regulatory reforms in some services industries have a positive impact on capital accumulation, which in turn might lead to higher labour productivity.

[2] Another established strand of literature shows that liberalization in key service sectors is beneficial for the performance of downstream activities, such as in the case of financial services (Guiso, Sapienza & Zingales 2004) and public utilities (Ahn 2002).

of the problems that affect cross-country studies and draw some general lessons on the effects of regulatory barriers in services.[3] The Italian retail sector, which has a prevalence of traditional small stores, underwent a major regulatory change in 1998. A central feature of the new law is that it delegates the regulation of entry of medium-large stores to local authorities. As it turns out, local regulations differ substantially in their approach to competition: in particular, most regions have established stringent ceilings to the floor space that can be authorized for entry of medium-large stores at the local level. This constitutes an interesting policy experiment, as entry barriers are the most effective instrument for restricting competition (Djankov, La Porta & Lopez-de Silanes 2001, Klapper, Laeven & Rajan 2006). Indeed, Foster, Haltiwanger & Krizan (2002) show that net entry is the major determinant of productivity growth in US retail trade. We use cross-sectional variation in entry ceilings, normalized for local population, to identify the effects of entry barriers on economic performance. This measure is predetermined with respect to the subsequent evolution, and therefore does not share the endogeneity problem of actual entry, which crucially depends on the attractiveness of the local market.

We measure performance in terms of profit margins, productivity, ICT adoption and prices. Our study therefore complements that of Bertrand & Kramarz (2002), who consider the effects of entry barriers on employment in the French retail sector.[4] The firm data come from the "Company Accounts System", a representative survey run by the National Institute for Statistics (Istat). In the basic specification, the effects of the entry barriers are identified using local fixed effects, that is, comparing performance at the local level before and after 2000, the year in which local regulations came into effect. This controls for fixed local conditions. We also control for the (inverse of the) initial level of floor space over population to account for the possibility that new admissible floor space is related to existing floor space and, through a full set of year dummies, for overall trends in productivity.

We find that entry barriers play a substantial role in explaining local performance. According to our estimates, large stores in the area at the 75^{th} percentile of the barrier distribution recorded higher margins by about 15% with respect to those in the area at

[3] Studying the retail trade is of interest in itself, as this sector employs a substantial portion of the workforce in all the industrialized economies. Moreover, differences in productivity growth between the US and Europe have been greatest in retail trade, which alone explains a large fraction of the total gap (Gordon 2004, van Ark, Inklaar & McGuckin 2002).

[4] In addition to considering different outcome variables, we also differ in terms of the empirical design, as we discuss in more detail later.

the 25^{th} percentile. The same exercise for productivity implies a difference of about 5%. We also find that greater competition increases the propensity to invest in ICT. Finally, consistently with lower margins and higher productivity, price inflation of goods in the "food and beverages" retail sub-sector – the segment with the greatest presence of large stores – is positively related to the barrier indicator.

These results are robust to a number of checks. We run IV regressions using political variables as instruments (Besley & Case 2000). Specifically, we instrument the barrier indicator with the share of votes of the extreme left and right (both likely to oppose liberalization) in the general elections. We find that the effects become even stronger under this specification, suggesting that measurement error and/or endogeneity issues might actually bias the fixed-effects estimates downwards. We show that entry barriers are not correlated with pre-existing trends and have no effects on performance in the "hotels and restaurants" and "other non-professional services" sectors, which are the most similar to the retail trade. This excludes the possibility that entry barriers are proxying for generally less favorable legislation for business activity. We also experiment with different sub-samples and time periods. All in all, the evidence is fully consistent with the notion that barriers to competition increase firms' profits and reduce efficiency and innovation and that this, in turn, leads to higher prices for consumers. In the conclusions, we argue that these results can contribute to the debate on the political economy of the reform process.

The rest of the paper is organized as follows. Section 2 describes the 1998 law that reorganized the regulation of the sector and documents the construction of the entry barriers indicator. Section 3 introduces the data and the empirical approach. The main results are discussed in Section 4, while the IV estimates and the robustness checks are reported in Sections 5 and 6 respectively. Section 7 concludes.

2 The Indicator of Entry Barriers

The Italian retail sector is currently regulated by the Bersani Law (*Decreto legislativo n. 114/1998*), passed in March 1998. The law was drafted to increase competition and foster the modernization of the Italy's retail sector by reducing entry barriers and administrative formalities. Following the trend towards the decentralization of decision-making that began in the early 1990s, the law delegates substantial regulatory power to local authorities. This makes the case of Italy interesting to study, as local legislation induced significant variations

in regulation within a single country, with a high degree of homogeneity in other institutional features.

Local governments decide store opening hours (opening hours per day and opening time interval), whether shops can be opened all week and at night, the maximum number of sales days and so on (see Table 1). Arguably, the most important aspect is the entry of large stores. We focus the analysis on precisely this aspect, as entry barriers are the most effective instrument for restricting competition (Djankov et al. 2001, Klapper et al. 2006). Before the Bersani Law, opening either small or large outlets required a permit from the town council.[5] Given that no information is available on how single municipalities used to regulate the retail trade activity, it is impossible to construct indicators of regulation before 1998. We will therefore control for pre-existing conditions with both local fixed effects and with measures of local retail trade structure as of year 2000, when the reform was implemented.

The Bersani Law defined three types of establishments: (1) small (also called neighborhood stores): up to 150 square meters of sales space; (2) medium-sized: between 150 and 1,500 square meters; and (3) large establishments: over 1,500 square meters. In cities with more than 10,000 inhabitants, the thresholds are raised respectively to 250 and 2,500 square meters. The law eliminated authorization for small establishments, which are now only required to notify their opening to the town council on the principle "no reply means approval". Medium stores have to apply to the town council as before the Bersani Law. Large store openings or enlargements are regulated at the regional level. Each regional government must draw up a commercial zoning plan for the development of large stores, taking into account environmental and urban considerations. The Italian regional governments also set up regional boards, called *"Conferenza dei servizi"*, to process applications and verify that openings comply with the regional zoning plan. The regional governments are also competent to determine the composition of the regional zoning boards. Most of them are composed of regional and municipal councillors, as well as representatives of consumers and owners of small stores. The Italian regional governments were obliged to draw up their

[5]The first national regulation concerning the retail trade sector was the "*Regio decreto legge no. 2174*" of 1926. This law laid down that any commercial opening had to be authorized by the town council, which could approve or reject applications at its discretion. To increase transparency in the approval procedure, in 1971 a new national law (*Legge n. 476/1971*) established that the authorities had to set explicit rules for the location of new establishments, according to a town plan. Local plans regulated the opening of new retail stores until the Bersani Law came into effect.

local commercial regulations by April 1999. In the meantime, the law blocked any pending authorization procedures with the result that no new permits could be issued in the absence of a regional zoning plan.[6]

The commercial zoning plans of all regions[7] but three (Piedmont, Emilia Romagna and Marche) set stringent limits to entry of large stores, following a roughly similar approach. They divided the region into areas, mostly coinciding with the administrative provinces,[8] and for each of them established the maximum floor space for new large stores that could be authorized and/or the maximum number of new large stores allowed until the next review of the zoning plan: once such limit was reached, no more entry would be allowed. We went through each regional zoning plan and constructed an indicator of the floor space that could be authorized for each province. In appendix A we describe the procedure followed to construct the admissible floor space for each regional zoning plan. Table 1 reports summary statistics of the regulation indicators, aggregated at the level of the region.

Entry ceilings are a good measure of entry restrictions, with some clear advantages with respect to other indicators used in the literature. Actual entry crucially depends on the attractiveness of the local market as well as on entry restrictions. For example, entry will be higher in markets where expected profits are higher. The same problems occurs when considering applications for a building permit. A related advantage is that, since it is fixed at the beginning of the period, it is by construction independent from all the unforseen shocks that can hit a local market after its approval. Moreover, there is some evidence that the ceilings were set to a large extent in an unsystematic way. In the process of data collection, we directly contacted many regional officials in charge of drafting the plans. We asked them what principles inspired the plans in general and the entry ceilings in particular. Regarding the latter, the typical answer was that they wanted an instrument to control entry but that, given that this was the first time that they regulated the sector and that the time frame to draw the regulation was rather short, they followed simple rules-of-thumb, not based on a systematic analysis of the local sectoral characteristics (see Appendix A). This suggests that barriers were to a certain degree random, although we do not rule out the possibility

[6] During this period, large store openings were possible only if the corresponding permit was issued before March 1998.

[7] We excluded Friuli Venezia Giulia, a region of the North-East, because, having special powers as a border region (*regione a statuto speciale)*, it decided not to comply with the Bersani reform.

[8] A province is an administrative area roughly comparable in size to the US counties. On average, there are 5 provinces within each region.

of endogeneity, an issue to which we will devote substantial attention later.

To account for the size of the market, we take the ratio of the population (in thousands) to the admissible floor space (henceforth, PAFS) in the province and use this variable as our preferred measure of entry barriers, as many regional regulations explicitly mention the province population as the key variable to set limits to total new admissible floor space. Thus, the higher the ratio of the population to the admissible floor space, the greater the entry restrictions. Correspondingly, we set the ratio to zero in the provinces of the three regions without pre-set limits. PAFS vary from a minimum of zero for the provinces of three liberalizing regions to a maximum of .29. The mean is equal to .038 (corresponding to 26.3 meters per 1,000 inhabitants), the median to .024 (41.6 meters per 1,000 inhabitants); the standard deviation is .05. Figure 1 gives a graphical representation of the PAFS for the Italian provinces, by percentiles. While the three regions with no pre-set ceilings are all in the North and Center, there is no clear geographical pattern among the others: for example, much of the North-East has fairly stringent limits, while the contrary occurs in Sicily. Actual values of PAFS by province are reported in Table 11.

In terms of the properties of our indicator, as expected entry restrictions are correlated with actual subsequent entry. The correlation coefficient between the new admissible floor space and actual entry in the period 2000-2002 (in sq. m., as recorded by the Ministry of Industry and Commerce by province) is .5; that between PAFS and the ratio between actual entry in sq. m. and population is .3. In many provinces (e.g. those located in Veneto, Liguria, Abruzzo, Calabria) the ceiling was reached in 2-3 years; after that, no permits could be issued until the the revision of the zoning plans, which occurred in different years. In fact, some regions explicitly set the time limit for their regional zoning plans, others did not indicate a period of validity for the limits. The first revisions of the plans started in late 2002. All new regulations tightened entry of large stores (see Appendix 2), generally the more so the more liberal previous regulation had been. This can be interpreted as evidence that some regions realized only ex post that their plans allowed for "too much entry", giving rise to political pressure from the incumbents to curb competition.[9] On the one hand this

[9] A clear example is that of Marche, where fairly liberal regulation was initially approved (Regional Regulation 26/1999). In December 2002, however, worried by the rapid and unexpected increase in the number of large stores applying to open in the region, the regional government suspended large store openings (Regional Regulation 19/2002) and announced the intention to fully revise the local regulation, setting limits on the maximum number of large store openings. Following the same strategy, the regional authorities of Piedmont suspended new openings in 2005 and in 2006 issued a new restrictive regulation with quantitative limits on large store openings (Regional Regulation 59/2006).

implies that revised plans are likely to be much more dependent on the local evolution of the sector, on the other it confirms that entry regulations were initially set to a large extent without a coherent development plan. Therefore, we only consider the PAFS set in the first wave of regional plans (i.e. up to the end of 2002), to avoid endogeneity issues due to the fact that after 2003 the Italian regional authorities might have set new limits in response to the new opening occurred between 2000 and 2003.

We also compute the ratio of the population to existing large store floor space in 2000 (thousand/sq.m.), supplied by the Ministry of Industry and Trade, and report it in Figure 2. Additional floor space could be correlated to the existing space: for example, there could be a catching-up process whereby the laggard regions adopt less restrictive regulation. We find no clear correlation between the existing floor space and the restrictions imposed by the regional zoning plans. For example, in the three regions that did not impose any prior limit (Piedmont, Marche and Emilia Romagna), the ratio between existing floor space and population was higher than the national average. Similarly, some regions with a low stock of large store surface (e.g. Campania, Basilicata and Sardinia) imposed high entry barriers. The correlation coefficient between existing surface and total admissible surface is .14. This indicates that our measure of barriers does not simply reflect the catching up of regions that lag behind in the development of large stores, again in line with the hypothesis of a certain degree of randomness in the determination of ceilings. A clear North-South divide emerges in terms of initial conditions: southern regions had lower levels of large store development in 2000, indicating a lag in the modernization of the sector.

Finally, the correlation between entry barriers and other aspects of the regulation, such as opening hours, Sunday openings, etc. is generally low in absolute value and negative for all indicators except the possibility of opening all week. This indicates that entry barriers are not likely to proxy for other aspects of the regulation.

3 Data and Empirical Model

We now turn to the description of the empirical approach used to determine the effects of entry barriers. We start by describing the data and then move on to the empirical model.

3.1 Data

The measure of entry barriers has been described at length in Section 2. The empirical analysis is based on two additional datasets: one on firms and one on prices.

Data on firms are derived from the Italian survey "Company Accounts Syste" (*Sistema dei conti delle imprese*), carried out every year since 1992 by the Italian Institute for Statistics (Istat). The survey is conducted according to EU Regulation 58/97 ("Structural Business Statistics", SBS) and provides information on many aspects of firms' activity. The basic sample units are firms that entered the market at least one year before the reference period. The sample is stratified by region, sector and size of workforce. For confidentiality reasons, the survey does not allow to link firms over time, so that the data can be accessed as a repeated cross-section. The sampling procedure divides firms into two groups according to a given size threshold: all firms with a number of employees above the threshold are included in the sample; firms below the threshold are randomly selected and not followed over time. From 1993 to 1997 the threshold was 20 employees; in 1998 it was increased to 100 employees. This change in the sample design, as well as changes in the survey questionnaire, prevents full comparability of the information over time. Moreover, again due to confidentiality concerns, Istat does not allow access to the data on firms with more than 100 employees from 1998 onwards. We therefore use data on retail firms (ISIC 52[10]) with less than 100 employees for the period 1998-2003.[11] According to aggregate statistics published by Istat and based on the same data (Istat 2004), in 1998 firms with no more than 100 employees represented 99% of total retail firms, 87% of total employees and 75% of total aggregate sales (see Table 2).

The barriers we are considering apply to large stores (see above). As long as there is some market segmentation between medium-large and small stores, we expect any effect of entry restrictions to be stronger in the population directly affected by the regulation, i.e. medium-large stores, than in small ones. Because the survey does not contain information on floor space, we use the number of employees to identify medium-large stores. We perform the analysis on two samples: the *total sample* (i.e. all firms with less than 100 employees,

[10]Excluding ISIC 5231 "Dispensing chemists", 5232 "Retail sales of medical and orthopedic goods" and ISIC 5250-5274 "Retail sales of tobacco, second-hand goods and repairs". Stores in these sub-sectors are typically small. We have also excluded retail sales not carried out in stores.

[11]For the years 1993-1997 we have access only to data on firms with 20+ employees. In 1998-2004 the total sample size of the surveys amount to about 50,000 observations each year. The response rate is around 40%.

given that those with more than 100 are not available) and the sample of medium-large retailers (the *restricted sample*). According to the Ministry of Industry and Trade, average employment in stores defined as "large" is 24, with a standard deviation of 8; we define as medium-large firms those with at least 16 employees.[12] The final total sample amounts to more than 8,000 firm-year observations and the restricted one to more than 1,600.

The survey reports the number of workers, hours worked, labour costs, sales, investments, software expenditure and the administrative province where the headquarters of the firm are located. Unfortunately, plant-level information is not available. However, firms are required to report both the number of establishments and the number of employees working in stores located in regions other than that of the headquarters. To minimize geographical misplacement, we select only the firms with at least 90% of the workforce employed in the region of the main branch. We have also run all our estimates on single-shop firms, obtaining very similar results. Indeed, according to the data of the Ministry of Industry and Commerce, almost 80% of total retail trade stores are single-plant. Multi-plant firms are typically food mega-stores not included in our sample. Among firms with 1-100 employees, multi-plant firms are just 7%. The different plants tend to be located in very narrow geographical areas. The share of firms with at least 90% of the workforce employed in the same region of the main branch amounted to 99% in 1998. These aggregate figures reflect the fact that the Italian retail trade sector is based on family firms which typically own just one shop, directly managed by the household members. This is true also for medium stores, which often belong to a single family-firm, even if they carry out a franchise with larger (often wholesale) firms. Therefore it is plausible to conclude that our sample is mainly composed of single-shop firms for which firm-level data and plant-level data fully coincide.

We also study the effects of entry barriers on the yearly average "food and beverage" price index at the local level, published every month by Istat since 1996 for each regional administrative capital. We focus on this index because large outlets are relatively more numerous in this sub-sector that in others.[13] Thus, we expect that "food and beverage" prices will depend strictly on the development of large stores.

[12]There are other reasons to choose the 16 employee threshold. First, employment protection legislation applies to different degrees to firms below the 16 employee threshold. Schivardi & Torrini (2008) show that the threshold does induce some discontinuities in firms' behavior. Moreover, small, family businesses are likely to have less clean balance sheet information and to use more unreported work (such as family help or irregular workers), making the computation of profit margins and productivity less reliable.

[13] For instance, in 1998 the share of value added of firms with more than 16 employees was 60% in "food and beverage" and 27% in "clothing" and "household equipment".

Table 3 reports descriptive statistics for the variables used in the regressions for the total and the restricted sample. Profit margins are defined as the log of the ratio between gross operating surplus and sales. Sales (in logs) are commonly used as a proxy of value added in retail trade (see e.g. Foster et al. 2002). Real sales per hour worked are used as a measure of retail trade labour productivity. One problem with computing real sales is that different degrees of liberalization might imply differences in price inflation, making the the use of a common price deflator problematic: in particular, price increases due to lower competition would erroneously translate into productivity differences. To overcome this problem, real sales are obtained using the regional consumer price indexes, including also the food and beverage index described above. The sectoral classification of price data differs from the one of firms. Prices are collected for the following groups of goods: (1) food and beverages; (2) clothing; (3) household equipment.[14] We have divided firms into the same three groups according to the type of good sold (and derived from their ISIC classification) and deflated firms' nominal sales by the yearly average of the corresponding regional consumer price indexes. ICT investment is measured by the probability that a firm has positive expenditure on software. We also report average firm size (in logs).

The data in Table 3 suggest that the reform was in general not very effective in improving efficiency: on average, profit margins rose and productivity fell. In fact, there is a growing consensus that, contrary to its objectives, the consequences of the Bersani Law were in most cases to strengthen entry barriers for large stores (see ISAE (2002) and AGCM (2007) for evidence and a review of the literature on this topic). Note that this is not a problem for our empirical strategy, as we only use the cross sectional variation in barriers to estimate their effects: all we need is differences in the degree of stringency across provinces.

3.2 Empirical Strategy

Our empirical approach is based on the comparison of performance according to the degree of entry restrictions imposed by local regulations. As explained above, our measure of entry barriers is fixed once for all in 2000, so it avoids the endogeneity problems of ex-post measures, such as actual entry. Although we have argued that regulation was to some extent random, we nonetheless need to account for the possibility that entry restrictions are at least partially set in relation to pre-existing conditions or to expected developments

[14] COICOP classification: Codes 01, 03 and 05.

in the local market. Consider the case of a province where profit margins are particularly high before 2000 and potentially more affected by entry; firms in this province are likely (and have the resources) to exert political pressure for a restrictive entry regulation. In this case, we would observe ex-post high entry barriers and large profits in the province, but the causal relation would be questionable.

Our preferred estimates are based on province fixed effects and include years from 1998 (i.e. before the reform) to 2003, as regional regulations started to be modified between the end of 2002 and the first semester of 2003. As discussed by Besley & Case (2000), fixed-effects models have clear advantages over a pure cross-sectional analysis. By considering the within-province variation before and after 2000, we control for area-specific fixed factors, so that only within-province variability contributes to the estimation of the barriers' effects. By including year dummies, we also control for aggregate factors, such as any general trend in productivity; sub-sector dummies also control for potential differences at the sub-sector level. The approach is implemented with the following regression:

$$y_{ijt} = \alpha_0 + \alpha_1 D * PAFS_j + \alpha_2' X_{ijt} + T_t + R_j + S_i + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the relevant outcome for firm i in area j in year t, $PAFS_j$ is the indicator of entry barriers of area j following the inception of the Bersani Law, X_{ijt} are time-varying controls, T_t, R_j and S_i are year, area (99 administrative provinces[15]) and 7 retail sub-sector dummies (ISIC at three digits) respectively; ε_{ijt} is an error term. Since the regulations were set between the end of 1999 and the first semester of 2000 and started to be revised between the end of 2002 and 2003, D is a dummy equal to 0 for years 1998 and 1999 and to 1 for the years 2000-2003. Under the assumption that, conditional on the other controls, the $PAFS$ indicator is uncorrelated with ε_{ijt}, the coefficient α_1 identifies the effect of entry barriers on y_{ijt}.

The fixed-effects approach controls for any fixed attribute that might determine outcomes, addressing the most likely endogeneity concerns. Regulation might still be endogenous with respect to specific, time-varying shocks to the retail sector that influence regulation and performance.[16] For example, the opening of a new highway might affect firms' productivity and profit margins and also influence regulation, as potential entrants exert

[15] In Italy there are 103 provinces, of which 4 are located in Friuli Venezia Giulia and excluded from the sample.

[16] We consider the possibility of *aggregate* local factors below.

political pressure to obtain building permits in the proximity of the new facility. Moreover, our barrier indicator might be affected by measurement error. To account for both potential endogeneity and measurement error, we will also pursue an instrumental variable approach. We follow the previous literature (Besley & Case 2000, Bertrand & Kramarz 2002) and use political variables as instruments.

One can also argue that entry barriers might be correlated with different *trends* (as opposed to levels) in firms' performance, which would invalidate the causal interpretation of α_1 in terms of entry regulation. Following up on the example above, this would be the case if provinces where profits are growing relatively faster are those where firms exert more pressure for entry restraints. We can provide evidence to support the validity of this identification assumption against correlated differences in trends. If the level of barriers is correlated with unobservable factors also determining the trend of y_{ijt}, one would reasonably expect that these factors influenced firms' performance even before the local inception of the Bersani Law, i.e. before 2000. Thus, we run regressions such as (1) for the period 1993-1997, where D is now a dummy equal to 1 for the years 1995-1997 and 0 otherwise. In this regression α_1 is a measure of correlation of PAFS and differences in trends observed before the inception of the Bersani Law. Thus, a test for $\alpha_1 = 0$ can be interpreted as a test for the lack of correlation between policies in 2000 and past differences in trends.

Finally, the above approaches are vulnerable to local shocks (uncorrelated with the levels and the trend of performance) that influence both performance and regulation. In fact, there could be general economic factors that influence performance in retail trade and are correlated with retail trade regulation. For example, regional boards that pass more stringent entry regulations might generally adopt a legislation that is less conducive to economic growth. In this case, α_1 would also capture these unobserved factors. We can again provide evidence supporting our identification assumption. Following Bertrand & Kramarz (2002), we run regression (1) for firms belonging to other, similar sectors, such as hotels and restaurants and other non-professional services. An estimate of α_1 not significantly different from zero would indicate that our measure of entry barriers is not capturing some overall correlated effects, as it only correlates with outcomes in retail trade.

4 Results

In this section we analyze the effects of entry barriers on profit margins, productivity, investment in ICT and prices. We regress these variables on the measure of entry barriers after 2000 and on year, province and sub-sector dummies, according to the basic specification in (1). As firm control, we include size, measured by the log number of workers. Larger firms tend to have lower profit margins, higher productivity and greater propensity to invest in ICT. By controlling for size, therefore, we are isolating the direct effects of entry barriers on incumbent performance, net of any size structure variation caused by the different degree of liberalization. Given that liberalizing the entry of large stores will most likely result in an increase in average size, our results can be seen as a lower bound of the total effects of barriers. The literature also suggests including other local factors that could potentially influence firms' outcomes and policies (Besley & Case 2000). Economic indicators at the provincial level are almost non-existent. We include the unemployment rate as a measure of the local business cycle. We report regressions for both the total and the restricted samples.

4.1 Profit Margins

The most likely effect of an increase in competition is a reduction in profit margins. If our measure of entry barriers is actually capturing variations in competitive pressures, we should find that profit margins are lower for firms located in provinces with a lower PAFS. And this is exactly what we do find. Table 4 reports the results for the profit margin regression. The dependent variable is the log of the gross operating surplus over sales at the level of the firm. The first two columns relate to the total sample. The coefficient on the PAFS indicator is positive (.70), with a p-value of .10. To better appreciate the effect, moving from the 25^{th} (.00787) to the 75^{th} (.05455) percentile of the PAFS distribution would increase margins by 3%. Unsurprisingly, we also find that size is negatively correlated with profit margins: larger stores have lower intermediation margins; the local unemployment rate is never statistically significant.

As argued above, one possibility is that PAFS is correlated with the pre-existing local conditions of the sector, particularly in terms of existing floor space. While we have shown that this does not seem to be the case, to further exclude this possibility, in the second column we also include the population over initial space, i.e. in 2000, the time of the reform. Given that we already have provinces fixed effects, we interact the initial floor

space with the post-2000 dummy, otherwise initial floor space would be perfectly collinear with province dummies. By interacting it with the post-2000 dummy, we isolate the effect (if any) of initial floor space on subsequent growth. The effect of this variable is insignificant and all other coefficients are unchanged, confirming that pre-existing conditions are not a source of distortion of the estimates.

The next two columns report the results of the same regressions restricted to the population of medium-large sized stores, which is most likely to be directly affected by the entry regulation. The results clearly support this assumption: all effects become larger and statistically more significant. The coefficient on the PAFS is 3.32 and significant at 1%. Going from the 25^{th} to the 75^{th} percentile of the PAFS distribution would increase profits by around 15%, a very sizable effect. Also in this case the inclusion of the initial value of the population over floor space does not change the estimated coefficients. We conclude that entry barriers exert a strong effect on profits, the more so for the population of firms directly affected by the regulation, in line with the assumption of a certain degree of market segmentation between small and large stores.

4.2 Productivity

We measure labour productivity as real sales per hours worked. As explained above, to account for the possibility that prices themselves are influenced by the regulation, we use the regional deflators described in Section 3.1. The regression results are reported in Table 5, organized like the previous one. In the total sample, the estimated coefficient on the PAFS indicator is negative (-.51) with a p-value of .09. Results do not change when introducing population over the initial level of floor space. Neither firm size nor the unemployment rate are correlated with productivity.

When we consider the restricted sample, the estimate doubles in absolute value (-1.04) and is significant at 1% (p-value of .00). Moving from the first to the third quartile of the distribution implies a decrease in productivity of around 5%. Results are unchanged when we introduce the initial level; the coefficient on this variable is negative and significant, a further indication that competition fosters productivity growth. We also find that, in this sub-sample, size is positively related to productivity, with a semi-elasticity of 7%. One possible explanation of the difference with the total sample is that the large number of small stores in the total sample makes it harder to properly detect a size effect. It also suggests

that measurement error for small stores might be a concern.

4.3 ICT Investment

Why does competition increase productivity? Along with the traditional channels, based on the idea that market power generates production inefficiencies (Leibenstein 1966), competition may foster innovation and, through this, productivity growth of incumbents, as found for example by Aghion, Blundell, Griffith, Howitt & Prantl (2005). In the case of retail trade, process (as opposed to product) innovation is the main determinant of productivity growth. This implies that ICT investment should be a fundamental determinant of productivity growth, as such technologies allow logistics, inventory management and so on to be rationalized. For example, van Ark et al. (2002) attribute the substantial differences in productivity growth in retail trade between the US and Europe mainly to the different rates of ICT adoption. In turn, these could be due to the fact that entry restrictions slow down the rate of diffusion of new technologies among incumbents, which are less at risk of lagging behind more efficient entrants.[17]

We address this issue by using the probability of having non-zero expenditure on software.[18] The results of the probit regressions are shown in Table 6, where we report the marginal effects. We find support for the hypothesis that competition fosters ICT adoption. In the total sample there is a negative correlation between entry barriers and the probability of positive ICT investment, significant at 5%. The estimated coefficient becomes larger in absolute value in the total sample (significant at 10%). Not surprisingly, firm size strongly increases the probability of ICT investment, as found for example by Fabiani, Schivardi & Trento (2005) for a sample of Italian manufacturing firms.

4.4 Prices

A natural conclusion of the previous analysis concerns prices. In fact, consumers should enjoy lower prices because of both the decrease in profit margins and the productivity increase. Ideally, one would need store level prices, such as from scanner data; unfortunately,

[17] Alesina et al. (2005) study deregulation in the transportation, communication and utilities sectors and find that it is associated with a spur in capital accumulation, particularly following entry liberalization. The beneficial effects of removing entry barriers for a modern efficient organization of supply is also found by Viviano (Forthcoming), who shows that more liberal entry regulation has been accompanied by a generalized increase in size of more traditional stores.

[18] We have also experimented with ICT expenditure over sales, finding similar results.

we do not have this type of information. As an alternative, we use the component of the CPI for "food and beverage". As mentioned in Section 3.1, these data are available for each regional administrative capital, a rougher level of geographical aggregation than the entry barrier measure, which is computed for provinces. Data are collected monthly; we use yearly averages from 1996 to 2003. This price series is longer than that of firms, allowing for a better estimate of the province fixed effects. Of course, the price of goods depends on the whole production chain; however, to the extent that the other components of the production chain are tradable, changes should be common across areas: for example, producer prices of food should have little local variability, as such goods are traded on a fairly integrated national market. Regional variations in final prices are therefore most likely to be attributed to the contribution of the retail sector.

The results are reported in Table 7. The coefficient on the barrier indicator is positive, showing that higher barriers are associated with larger price increases, and highly statistically significant. In quantitative terms, the effect is fairly modest: moving from the 25^{th} to the 75^{th} percentile of the PAFS distribution would increase prices by .4 percentage points. It should be noted that post-2000 was a low inflation period (the annual inflation rate was around 2%), so this effect is not negligible. The results are identical when including the indicator of initial conditions in 2000. Finally, we also find that provinces with a higher unemployment rate recorded smaller increases in prices. Overall, this evidence indicates that entry barriers translate into higher prices for final consumers.[19]

4.5 Robustness checks

We now test the robustness of the results with respect to a series of modifications to the basic specification. For brevity sake, we restrict the analysis to the two most important performance indicators, profit margins and productivity. To save on space, we do not report the results but only comment them in the text; they are available upon request.

To check whether our results are influenced by the fact that we only have firm-level information we have carried out the estimates considering single-plant firms only. Sample size is now smaller and equal to roughly 7,000 units in the total sample and 1,300 in the restricted one. The results are basically identical to those reported in Table 4 and 5.

One might argue that PAFS are more effective at restraining competition in provinces

[19]Similar conclusions on the relation between competition and price changes are reached by Gaiotti & Lippi (2004) in their study of the effects of the changeover to the euro on the prices of restaurants.

with higher population density. Distance from other stores is one of the main sources of market power in this sector. In fact, a larger number of consumers concentrated in a small area implies a tighter competition between a given number of stores. On the contrary, if population is dispersed over a vast area, a given increase in floor space will result in a proportionally lower increase in competition. Thus, as a further robustness check we have split the sample according to the value of the province population density (residents per square kilometer higher or lower than the national average). The results confirm that the effects of PAFS are substantially stronger in the provinces with higher density.

We have used alternative controls for local economic conditions, such as value added per capita, which should measure any aggregate changes in productivity. We have also changed the employment threshold that defines a large store, using 20 and 50 workers. These modifications have no substantial bearing on the results. We have also explored time differences in the effects. One would expect the effects to take some time to show up in the data. As it turns out, estimating separate effects of the barriers for each year after 1999 gives very imprecise results, as the sample used for each estimate is too small to get precise estimates of province fixed effects. We have re-estimated the model dropping the observations for the year 2000. In fact, the inclusion of 2000 is questionable, as the regional regulations were issued in precisely that year. The results are in line with expectations: all the effects become slightly stronger, bearing out the notion that 2000 might have been a transition year. Finally, we have carried out estimates for the sub-periods 1998-2002 (the dummy D is equal to 1 for the years 2000-2002) and 1998-2004 (the dummy D is equal to 1 for the years 2000-2004), to verify whether our main results are affected by the choice of the time period. We have also carried out estimates in which the period ends in the year of the issue of the new regional regulation (i.e. the dummy D varies across regions and is equal to 1 from 2000 to the year of the change in the regional regulation). We did not find substantial differences with the results presented in Tables 4 and 5.

5 Instrumental Variables

In this section we pursue an instrumental variable approach. Although the fixed effects estimates address the most likely endogeneity issues, one could still argue that PAFS is correlated with the error term. First, there might be local, time-varying shocks to the retail sector not accounted for by the fixed effects, that might also be related to regulation. The

bias in the estimates could go either way. On one side, incumbents that expect to make large profits might spend more resources on lobbying for barriers, which would result in un upward bias of the fixed-effects estimates; on the other, the regulator might be more willing to liberalize entry if the sector is expected to earn large profits in the future (and vice versa): this would imply that the fixed-effects estimates are biased downwards. Another potential problem addressed by IVs is measurement error in the PAFS indicator, which would result in downward biased estimates. In fact, as discussed in Section 2, to derive a uniform measure of barriers from the commercial zoning plans we had to make some assumptions, which might induce a certain degree of measurement error in our indicator.

We use political variables as instruments. The political economy literature has established clear links between the characteristics of the political system and the reform process (Alesina, Ardagna & Trebbi 2006). In particular, political preferences of the population are likely to be a determinant of local regulation. It is well known that parties at the extreme of the political spectrum are less in favor of liberalization policies.[20] Extreme right-wing parties favor a corporative view of the economy and tend to protect the interests of the self employed and small businesses, as shown by Mayer (1986) for France. As argued by Alesina & Giavazzi (2007) on the basis of the Italian experience, extreme left-wing parties are against free markets and oppose liberalizations, even in cases where these will benefit mostly their constituency (the employees), through lower prices for consumers and higher employment. It therefore seems likely that, in areas where such parties are strong, there will be more pressure to draft a stringent entry regulation. We use the results of the general elections of 1996,[21] i.e. two years before the inception of the Bersani Law, to determine the political preferences of the local population in terms of liberalization policies. We choose the general elections because people are more likely to vote according to their political values, while in local elections the choices might not be independent from the regulation of the retail trade sector itself: the owner of a small store might vote for a right-wing party not because of ideology, but because it guarantees more protection against competition from large stores. The maintained assumption is that, *conditional on the other controls*, political preferences (as expressed in general elections) are not related to *changes* in performance in

[20] Extreme left-wing parties include: Rifondazione Comunista and Verdi; extreme right-wing parties include Movimento sociale, Alleanza Nazionale and Lega Nord.

[21] The results of the general election of 1996 are available only by election district, roughly coinciding with administrative regions. In 1996 there were 27 election districts, one for each region with the exception of Piedmont, Veneto, Lazio, Campania, Sicily (two districts) and Lombardy (three districts).

the retail sector.

To implement the IV we interact the instruments with the post-reform dummy: in fact, the barrier indicator is only turned on for this period. The results of the first stage regressions are reported in the first column of Table 8. A larger representation of the parties of the extreme right is clearly conducive to more stringent regulation; surprisingly, the correlation with the extreme left is negative, both for the linear and the quadratic term. One problem with interpreting these results is collinearity: the electoral shares of the extreme left and the extreme right tend to be correlated across districts. In any case, the indicators are jointly significant (with a partial R-squared higher than .20 in all regressions), supplying exogenous variability to the entry barrier indicator.

The following columns of Table 8 report the results of the second-stage regressions. First, consistently with previous results, higher barriers generate larger profits, both in the total and in the restricted sample. Moreover, the IV coefficients are roughly equal to the fixed-effects ones in the restricted sample (3.08 vs. 3.32), but substantially higher in the total sample (3.85 vs. .70). The coefficients of the productivity regressions are negative and significant, and increase in absolute values compared with the fixed-effects estimates (from -.51 to -2.55 in the full sample and from -1.04 to -2.13 in the restricted one). The standard Sargan statistics on the validity of excluded instruments are passed in all cases. Table 8 also reports the Anderson-Rubin test for the null hypothesis that the coefficient on PAFS is statistically not different from zero. This test is robust to potentially weak instruments.[22] The Anderson-Rubin test confirms that almost all the coefficients on PAFS are significant, with the exception of the coefficient of the productivity regression of the restricted sample.

The IV analysis lines up with the findings of the previous sections. Moreover, it indicates that, if anything, endogeneity would downward bias the estimates, a result in line with that of Bertrand & Kramarz (2002) for the French case. This result is consistent with both measurement error and a specific channel of reverse causality: local politicians internalize the sectoral performance when deciding regulation. The fact that the change in the size of the estimates is larger for the total sample indicates that, if the problem is endogeneity, then regulators are more concerned with the effects of regulation on small stores. This squares with the common wisdom that owners of small stores are an important source of political

[22] Calculated following the conditional approach proposed by Moreira (2003). Other statistics, such as the likelihood ratio test, the Wald and the score tests are not reported because they give similar results.

support. All in all, IV estimates further reinforce the conclusion that entry regulation impacts on the sectoral performance according to a textbook interpretation of the effects of entry barriers.

6 Ruling out Alternative Explanations

We next address two alternative explanations for our results. First, we control for the possibility that entry barriers are correlated with the *growth* of profits or productivity; second, we check whether our liberalization measure is proxying for some other, more general, local policy.

6.1 Checking for Differences in the Underlying Trends

To control for the possibility that barriers are correlated with underlying trends, we repeat our regressions for the period before the introduction of the law, i.e. 1993-1997. If our indicators are capturing differences in trends among provinces, we should find that the entry barrier coefficients should still be significant when running the same regressions for the period before the law was passed.

As mentioned in Section 3.1, from 1993 to 1997 the sample of the Company Accounts System survey included all firms with more than 20 employees and only a representative sub-sample of smaller firms. Moreover, before 1998, the data only indicated the region where firms were located and not the province. Therefore, we derive a regional indicator of entry barriers, equal to the regional population divided by the sum of the admissible floor space in each province. The final sample size, comprising firms with more than 20 employees, amounts to 9,501 observations.

The results are reported in Table 9.[23] We split the period 1993-1997 in two, 1993-1994 and 1995-1997, and check for correlated differences in trends before the Bersani Law (i.e. D is equal to 1 for years from 1995 to 1997). Standard errors are clustered by region. Results are clear-cut: the entry barrier indicators are not significantly correlated either to profits or to productivity changes in the pre-reform period, indicating that entry barriers have actually induced a change in the levels rather than being correlated with some pre-existing underlying trends.

[23] Given that data on local prices are not available before 1996, we use nominal sales to measure productivity.

6.2 Other Sectors

A second possibility is that our results are driven by some omitted variables capturing, for example, a more general attitude of local governments towards business activity. Consider the case of a region with a very pro-market approach to the local economy. Such a region might enact a series of policies that stimulate economic activity in general, in addition to setting low entry barriers in retail trade. In this case, the entry barrier indicator may be proxying for a full set of economic policies. This possibility is limited by the fact that most economic policy decisions are taken at the central level; however, in recent years regions have continually gained areas of influence, so that this possibility cannot be excluded a priori. We directly tackle this issue empirically by controlling for any correlation between entry barriers in retail trade and performance in other fairly similar sectors. If entry barriers in retail trade are capturing more general policies, then we would expect them to be correlated with performance also in other similar sectors, even if these sectors are not directly influenced by the barriers.

We have chosen the two service sectors most similar to retail trade in terms of employment, regulation of activity and technology: hotels and restaurants (ISIC 551-554) and other low-wage service sectors (ISIC 747-748: cleaning, packaging, call centers). These sectors should respond to general policies in a similar way to the retail sector.

For consistency, we have selected firms with 1-100 employees and at least 90% of workforce in the same region of the main branch (but experimented with other thresholds, finding no differences). Table 10 reports the results of this exercise. No coefficient is statistically significant and signs are sometimes the opposite of those of the original regressions. This is true for both profit margins and productivity, in the hotels and restaurants as well as in the other (low-wage) service sectors.

Overall, these results indicate that profit margins and productivity in these service sectors are not correlated with the entry barriers in retail trade. This, in turn, allows us to rule out the possibility that such indicators are capturing some general characteristic of local policy and conclude that the effects we find for retail trade are due to the entry barriers themselves.

7 Conclusions

The lack of competition in the service sector has long been recognized as one of the structural weaknesses of the European economy (Nicoletti & Scarpetta 2003). In this paper, we exploit local variation in entry regulation in Italian provinces to study the effects of entry barriers on economic performance in retail trade. We find that barriers exert a strong influence on performance, increasing profit margins and prices, reducing productivity and ICT investment. Our results indicate that the social costs of regulation are substantial, as barriers to entry reduce efficiency and increase prices for consumers. At the same time, incumbents greatly benefit from them in terms of larger profits. This offers a clear rationale for the fierce opposition to liberalization policies by incumbents.

At the same time, the available evidence for retail trade indicates that liberalizations are especially beneficial for low-income people: consumers enjoy lower prices and employment increases (Bertrand & Kramarz 2002, Viviano Forthcoming). Despite this, free market policies are often opposed by a vast spectrum of political parties, including those more representative of low-income individuals (Alesina & Giavazzi 2007). This indicates that the political economy aspects of the regulation are key to understanding how liberalization should be pushed through the political agenda. This is what we plan to work on in the future.

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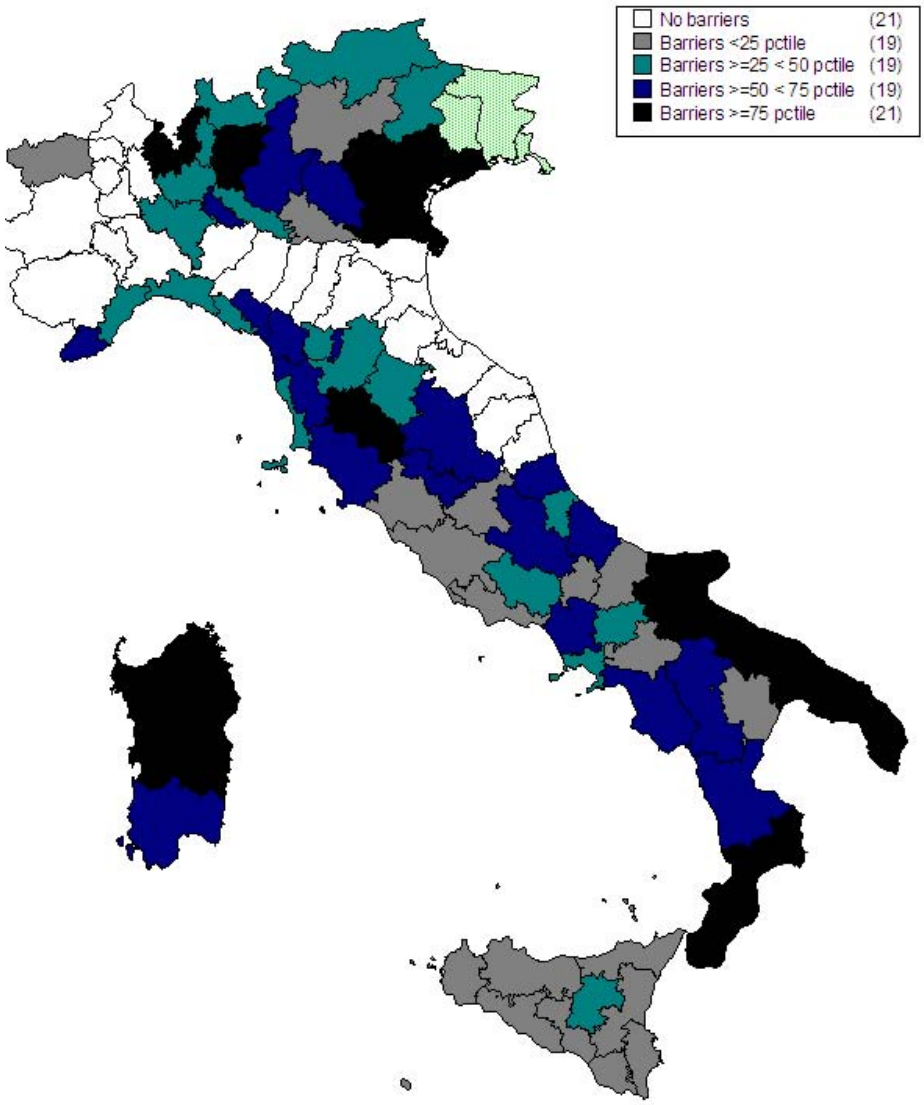
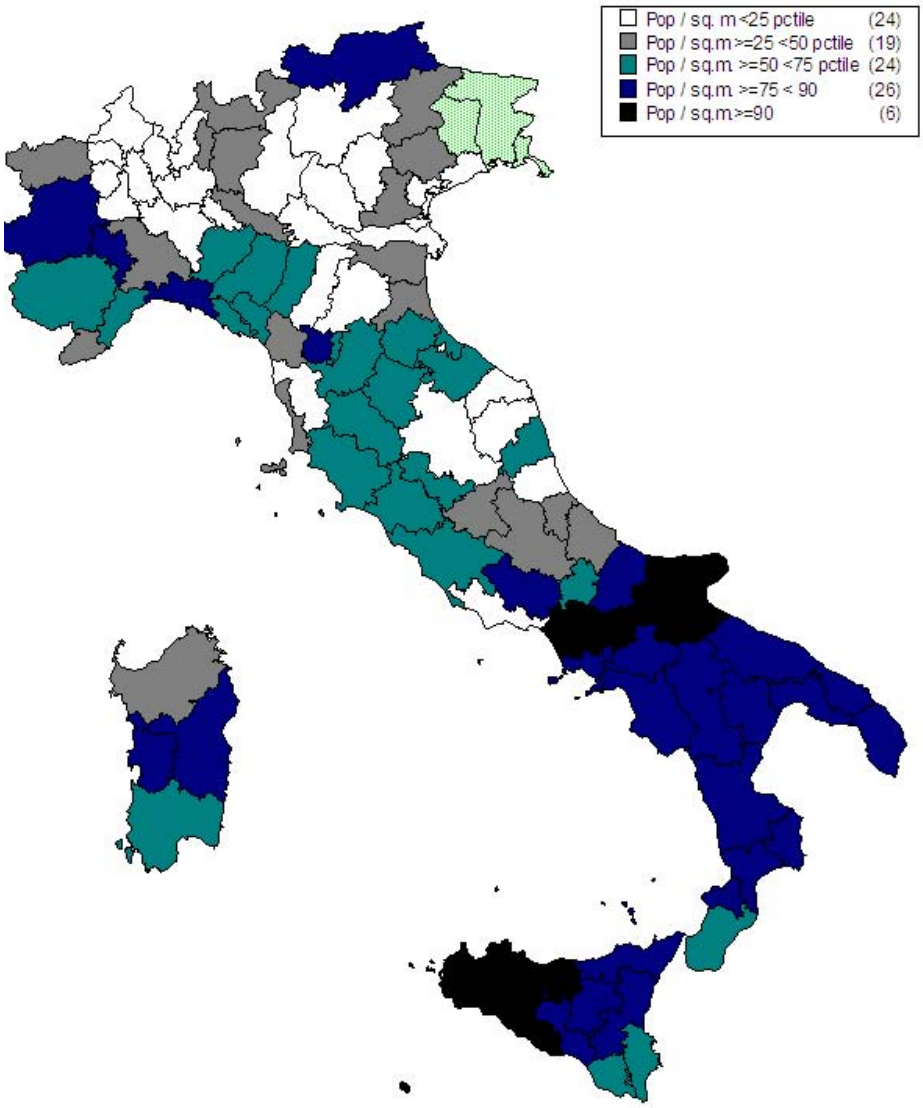
Figure 1: PAFS in Italian provinces



PAFS is population over additional floor space, set to zero for provinces without pre-set limits: the percentiles are computed within the group of provinces with non-zero limits. Source: our calculations based on regional regulations.

Figure 2: Population over initial floor space in Italian provinces



Population over existing large floor space in 2000 (thousand/sq.m.). Source: our calculations based on data of the Ministry of Industry and Trade.

Table 1: Regional regulations, from 1999-2000 to 2002-2003.

	Constraints:		Opening allowed:		Maximum no.	Allowed to open:	
	New admissible floor space (sq.mt)	PAFS	Between hours:	For no more than hours:	of days of sales	All the week	In the night
Piedmont	no	0	7-22	13	110	YES	YES
Valle d'Aosta	14,000	.009	7-22	13	100	YES	YES
Lombardy	289,691	.031	5-24	13	120	YES	YES
Trento	21,917	.021	7-20	13	60	NO	YES
Bolzano	61,076	.008	6-23	FREE	144	NO	YES
Veneto	67,600	.067	7-22	13	101	YES	YES
Liguria	76,425	.021	FREE	FREE	60	YES	.
Emilia Romagna	no	0	7-22	13	120	NO	NO
Tuscany	96,450	.037	5-24	FREE	120	YES	YES
Umbria	17,300	.048	7-22	13	120	YES	YES
Marche	no	0	7-22	FREE	107	YES	NO
Lazio	363,806	.015	.	.	84	YES	.
Abruzzo	40,000	.032	7-22	13	90	YES	NO
Molise	45,000	.007	7-22	13	107	YES	YES
Campania	214,540	.027	7-22	13	104	.	.
Apulia	99,040	.041	7-22	12	116	YES	NO
Basilicata	31,500	.019	.	.	120	.	.
Calabria	26,419	.077	7-22	13	90	YES	NO
Sicily	532,018	.010	7-22	12	120	NO	YES
Sardinia	28,180	.059	7-22	13	123	YES	YES

Source: Authors' calculations based on regional regulations and personal interviews conducted by the Bank of Italy in 2005 to regional representatives on the regional boards. Constraints on total surface are the sum of new admissible floor space allowed in each region.

Table 2: The structure of the Italian retail trade sector. Year 1998. (percentages)

	Firms	**Sales**	**Workers**
Firms with 100+	0.05	20.88	12.96
Firms 1-100	99.95	79.12	87.04
of which:			
1-15 workers	99.50	69.19	80.32
16-100	0.40	9.93	6.72

Source: Authors' calculations based on Istat aggregate data and micro-data.

Table 3: Summary statistics

	Sample:			
	All firms		16+ employees	
	Pre	Post	Pre	Post
	Profit margins			
Mean	-2.15	-2.12	-3.19	-3.05
St. Dev.	0.04	0.03	0.08	0.06
	Productivity			
Mean	9.02	9.03	9.20	9.13
St. Dev.	0.05	0.05	0.04	0.03
	Probability of ICT spending			
Mean	0.15	0.16	0.57	0.55
St. Dev.	0.01	0.01	0.05	0.03
	Firm size			
Mean	1.06	1.07	3.27	3.30
St. Dev.	0.02	0.01	0.03	0.02
Sample size	2,791	6,740	495	1,335

Source: Authors' calculations based on Istat data. Profit margins are log of gross operating surplus over total sales; productivity is the log of real sales over hours worked; probability of ICT spending is the share of firms with non-zero expenditure on software; firm size is the average number of workers (in logs).

Table 4: Profit margin regressions

	Sample:			
	All		16+ employees	
PAFS	0.70	0.70	3.32	3.30
	(.10)	(.10)	(.00)	(.00)
Initial space		0.22		1.49
		(.87)		(.64)
Firm size	-0.35	-0.35	-0.11	-0.11
	(.00)	(.00)	(.06)	(.06)
Unemployment rate	1.34	1.34	-0.09	-0.07
	(.12)	(.11)	(.97)	(.97)
R2	0.26	0.26	0.25	0.25
Sample size	8,633	8,633	1,795	1,795

The dependent variable is the log of gross operating surplus over total sales at the level of the firm; PAFS is population over additional floor space (for province with no limits,the corresponding value is set to zero); Initial floor is population over total floor space at the beginning of the period, i.e. in 1998. PAFS and Initial floor are interacted with a dummy equal to 1 in the post-reform period (i.e. after 1999). Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. All regressions include year (6), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 5: Productivity regressions

	Sample:			
	All		16+ employees	
PAFS	-0.51	-0.50	-1.04	-1.01
	(.09)	(.09)	(.00)	(.00)
Initial space		-1.08		-3.82
		(.35)		(.06)
Firm size	-0.01	-0.01	0.07	0.07
	(.61)	(.61)	(.06)	(.07)
Unemployment rate	-0.28	-0.29	-1.66	-1.75
	(.64)	(.62)	(.10)	(.09)
R2	0.14	0.14	0.23	0.23
Sample size	8,583	8,583	1,655	1,655

The dependent variable is the log of real sales over hours worked; PAFS is population over additional floor space (for province with no limits, the corresponding value is set to zero); Initial floor is population over total floor space at the beginning of the period. i.e. in 1998; PAFS and Initial floor are interacted with a dummy equal to 1 in the post-reform period (i.e. after 1999). Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. All regressions include year (6), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 6: Probability of positive ICT spending regressions

	Sample:			
	All		16+ employees	
PAFS	-0.23	-0.23	-0.63	-0.63
	(.05)	(.05)	(.07)	(.07)
Initial space		-0.13		-1.39
		(.83)		(.63)
Firm size	0.10	0.11	0.10	0.10
	(.00)	(.00)	(.00)	(.00)
Unemployment rate	0.03	0.02	0.06	0.04
	(.94)	(.94)	(.96)	(.97)
R2	0.18	0.19	0.09	0.09
Sample size	8,367	8,367	1,694	1,694

Probit estimates, marginal effects. The dependent variable is a dummy equal to 1 if the firm has positive ICT spending and 0 otherwise; PAFS is population over additional floor space (for province with no limits, the corresponding value is set to zero); Initial floor is population over total floor space at the beginning of the period. i.e. in 1998; PAFS and Initial floor are interacted with a dummy equal to 1 in the post-reform period (i.e. after 1999). Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. All regressions include year (6), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 7: Price regressions

	Sample:	
	Regional administrative capitals	
PAFS	0.08	0.08
	(.00)	(.00)
Initial space		-0.0002
		(.00)
Unemployment rate	-0.18	-0.18
	(.00)	(.00)
R2	0.97	0.97
Sample size	152	152

Yearly prices in food and beverages (excluding tobacco) at the regional level (19 regions). The time period is 1996-2004; PAFS is population over additional floor space (for province with no limits, the corresponding value is set to zero); Initial floor is population over total floor space at the beginning of the period. i.e. in 1998; PAFS and Initial floor are interacted with a dummy equal to 1 in the post-reform period (i.e. from 2000). P-values adjusted for clustering at the level of the region in brackets.

Table 8: IV regressions

	First stage	**Second stage**			
		Profit margins		**Productivity**	
		All firms	16+	All firms	16+
PAFS		3.08	3.85	-2.55	-2.13
		(.00)	(.00)	(.00)	(.08)
Firm size	-0.0002	-0.35	-0.11	-0.01	0.07
	(.32)	(.00)	(.00)	(.33)	(.00)
Unemployment rate	-0.26	1.95	0.02	-0.80	-1.88
	(.00)	(.02)	(.99)	(.24)	(.09)
Share of votes to right parties	0.01				
	(.00)				
Share of votes to right parties^2	-0.0002				
	(.00)				
Share of votes to left parties	-0.06				
	(.00)				
Share of votes to left parties^2	-0.0021				
	(.00)				
Partial R^2	0.21				
R^2		0.26	0.25	0.14	0.14
Sample size	8,633	8,633	1,795	8,583	1,655
Sargan statistics		3.45	5.39	3.43	1.66
(p-value)		(0.49)	(0.25)	(0.48)	(0.80)
Anderson-Rubin statistics		13.80	9.21	14.20	5.68
H_0: $\alpha_1 = 0$					
(95% C.V.)		9.49	9.49	9.49	9.49

The dependent variables are respectively PAFS (population over additional floor space, set to zero for provinces without pre-set limits and interacted with a dummy equal to 1 after 1998), log of gross operating surplus over total sales at the level of the firm in the second and third columns and the log of real sales over hours worked in the forth and fifth columns. Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. First stage regression refer to the profit margin regression for all firms. The other first stage regressions, not reported, give similar results. All regressions include year (6), province (99) and sub-sector (7) dummies. P-values in brackets.

Table 9: Pre-reform regressions (1993-97)

	Sample:	
	20+ firms	20+ firms
	Profit margins	**Productivity**
PAFS	-1.03	.10
	(.53)	(.73)
Firm size	-.25	.04
	(.00)	(.01)
Unemployment rate	2.96	-.97
	(.25)	(.22)
R^2	.15	.15
Sample size	8,783	1,552

The dependent variable is the log of gross operating surplus over total sales at the level of the firm in the first column and the log of real sales over hours worked in the second. Because of data constraints, the sample refers to firms with 20+ employees. PAFS is population over additional floor space, set to zero for provinces without pre-set limits and interacted with a dummy equal to 1 after 1996. Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. All regressions include year (5), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the region in brackets.

Table 10: Profit margins and productivity in other service sectors

	Hotels		**Other Services**	
	Prof. marg.	**Prod.**	**Prof. marg.**	**Prod.**
PAFS	0.23	0.52	0.21	0.43
	(.65)	(.11)	(.56)	(.37)
Firm size	-0.25	-0.15	-0.47	-0.19
	(.00)	(.00)	(.00)	(.00)
Unemployment rate	0.74	0.97	0.14	0.67
	(.37)	(.17)	(.81)	(.44)
R2	0.17	0.10	0.35	0.14
Sample size	4,810	4,701	15,343	10,322

The dependent variable is the log of gross operating surplus over total sales at the level of the firm in the first and third columns and the log of real sales over hours worked in the second and forth column. PAFS is population over additional floor space, set to zero for provinces without pre-set limits and interacted with a dummy equal to 1 in the post-reform period (i.e. after 1999). Firm size is the log of the number of workers; Unemployment rate is the province level unemployment rate. Hotels and restaurants correspond to the ISIC 551-554 sectors and other low wage service sectors to ISIC 747-748 (cleaning, packaging, call centers). All regressions include year (5), province (99) and sub-sector dummies (4 for hotels and restaurants and 2 for other services). P-values adjusted for clustering at the level of the province in brackets.

A Regional regulations

In this appendix we detail the procedure followed to construct our PAFS indicator. Before describing the process region by region, we explain the generale rules we followed. First, some regional regulations express the increase in total floor space as a percentage of existing floor space. To derive our measure of entry barriers we multiplied this increase by the total floor space reported in the census conducted by Italian Ministry of Industry and Trade. This records the aggregate existing floor space, the aggregate number of large outlets and the total number of employees by province since 1999. Two regions, Apulia and Calabria, set the maximum number of stores that could be licensed in each area. In order to get a measure of the corresponding floor space, we multiplied the number of openings allowed by the average surface of the large stores existing in a given area. Moreover, in order to get a province indicator, when two or more areas are located in the same province, the corresponding admissible floor space is the total. When an area extends over two provinces, the admissible floor space is assigned to the province whose territory includes the largest number of towns in the area. We exclude Friuli Venezia Giulia, a region of the North-East, because, having special powers as a border region (*regione a statuto speciale)*, it decided not to comply with the Bersani reform.

- Piedmont: The law L.R.28/99 did not set limits to new openings, so during the period 2000-2004 there were no entry barriers in this region. The regional authorities of Piedmont suspended new openings in 2005 and in 2006 issued a new restrictive regulation with quantitative limits on large store openings (Regional Regulation 59/2006).
- Valle d'Aosta: The law No. 12 of 1999 and the Regulation No. 1088 of 2000 established the number and the total surface available for new opening.
- Lombardia: The laws 14/99, 22/00, 3/00 and the regulation 6-42614/99 regulate the sector for the period 2000-2002. The regional territory is subdivided in 21 areas, for which quantitative limits to the number and the total surface are established. The province of Brescia is subdivided into 4 areas, the provinces of Varese and Pavia into three areas, Sondrio, Milano and Mantova into 2, Cremona, Como, Lecco, Lodi and Bergamo into 1. The laws state that these limits are calculated on the basis of the ratio of existing square meters and local population but no explicit formula is provided. The regulations 7-871/03 and 7-15602/03 set new more restrictive limits for the period 2003-05 (5% increase in provinces with a ratio sq.m./population higher than the national average; 10% increase in provinces with a ratio sq.m./population lower than the national average).
- Autonomous province of Trento: The territory is partitioned into three areas and for each one the law 4/00 set limits to the total surface of new large store.
- Autonomous province of Bolzano: The laws 9/99, and the regulations 64/99 and 39/00 establish that in 2000-2001 the sum of the floor space of new large outlets cannot exceed 50% of existing surface (30% in some areas). The regulation 2150/02 establishes that in the period 2002-2006 the increase of the total large store floor space cannot exceed 8% of the existing surface.
- Veneto: Between 1999 and 2000 several regional laws regulated the retail trade sector (Regional Laws No. 37 and No. 62 of 1999, Regional Regulations No 2263, 2337, 4664 of 1999, and No. 934, No. 1312 and No. 3493 of 2000). The regional territory is subdivided in 18 small areas with quantitative limits to new floor space. These limits were reached in almost all the areas in 2001. Only in 2004 the regional authorities set new constraints for new openings (Law 15 of 2004) and increased the total new admissible floor space from 67,000 to 113,000 sq.m. to partly compensate the stop occurred between 2001 and 2004.

- Liguria: The law 19/99 and the regulations 2644/99, 29/99, 443/99 and 874/99 set both the total number and the maximum floor space that can be authorized in each area. In the province of Genoa the limits were reached in 2002. New constraints for all the region were set in 2005.
- Emilia Romagna: The laws No. 14 of 1999 did not set quantitative limits for new large store openings. In 2000 (Regional Regulation No. 1410 of 2000) the regional authorities of Emilia Romagna assigned the town authorities some power to veto new large store openings. Since this policy increased the administrative burden of large store openings, in 2003 the regional authorities simplified the procedures for large shopping centers (Regional Regulation No. 480 of 2003). The effects of these laws are controversial. Because of the absence of quantitative limits on new openings, in this paper we classify Emilia Romagna among the regions with no barriers.
- Tuscany: For the period 2000-2002 the law 28/99 and the regulations 4/99 and 5/00 subdivide the regional territory into 41 areas (10 in Florence, 7 in Livorno, 5 in Arezzo, 4 in Lucca, Pistoia and Siena, 3 in Grosseto, 2 in Massa-Carrara, 1 in Prato and Pisa) and set limits to new square meters. In 2002 the regional territory was subdivided into 4 areas and new limits were introduced (in general more stringent than the previous ones, see the regulation 26/02).
- Umbria: The law No. 24 of August 1999 is particularly restrictive, since it establishes that no more than 2 new outlets, not exceeding 5,500 sq. m. each, can be opened in the province of Perugia during the period 2000-2005. Additional outlets can be opened only if located close to the main roads of the region.
- Marche: In 1999 the authorities of Marche approved fairly liberal regulations (Regional Regulation 26/1999), coherently with the original spirit of the Bersani law. In December 2002, however, worried by the rapid and unexpected increase in the number of large stores applying to open in the region, they suspended large store openings (Regional Regulation 19/2002) and announced their intention to revise fully the local regulation, setting limits on the maximum number of large store openings. This revision was included in a new regional law enacted in 2005, which subdivides the region into local markets and set limits on the opening of new large stores in each local market (Regional Regulation 9/2005).
- Lazio: The new admissible floor space is expressed as of a percentage increase of the ratio between existing floor space and the population, calculated at the province level (Laws No. 33 of 1999 and No. 17 of 2000; Regulations No. 557 of 1999 and 247 of 2000. Rome was subdivided into 2 sub-areas). The law No. 131 of November 2002 set new percentages for the period 2003-2005.
- Abruzzo: The regional law No. 22 of 1999 identified 5 areas and established that only 1 new outlet of at most 8,000 sq. m. could be authorized in each area (2 areas in Pescara, 1 area in each of the other 3 provinces). Between 2003 and 2004 almost all the new admissible floor space was assigned (with the exception of the province of L'Aquila). The regional law was revised in 2005, with new quantitative limits to large store openings.
- Molise: The law 33/99 and the regulation 1808/99 set the number of outlets and the maximum floor space of new outlets (no larger than 15.000 sq. m.) for each of the 3 areas constituting the region (2 areas in the province of Campobasso, 1 in the province of Isernia).
- Campania: The Regional laws No. 2243 of 1999 and No. 1 of 2000 set both the number and the maximum floor space that can be authorized during the period 2000-2002. The law identifies 14 areas: 2 in the province of Caserta, 1 in Benevento, 4 in Naples, 2 in Avellino and 5 in Salerno. The law No. 2072 issued in June 2003 set new limits for the period 2003-2005.

- Apulia: The law 24/99 and the regulation 1843/99 set limits to the number of new openings for the period 2000-2003 (no more than 6 new outlets in the whole region). These limits were revised in September 2004 (Regional Regulation 2/2004). The new law establishes that no more than 17 new outlets can be opened during the period 2004-2007. At the regional level the total maximum new floor space cannot exceed 222,000 sq. m.
- Basilicata: The laws No. 19 of 1999, No. 16 of 2000, and the regulation 556/00 identify both the number and the maximum floor space that can be assigned by province to new establishments.
- Calabria: The laws No. 17 of 1999 and the Regulation No. 3418 of 1999 set very rigid rules to large store openings. The regional territory is subdivided in 17 areas (8 areas in the province of Cosenza, 4 in Reggio Calabria, 3 in Catanzaro and 1 in Vibo Valentia and Croton). The total number of new outlets cannot exceed than 27 in the period 2000-2004. This threshold was reached in 2003. New constraints were set only in 2005.
- Sicily: The Regional Laws No. 28/1999 and No. 165/00 and the Regional Regulations 12/7/00 subdivide the regional territory into areas and set the maximum floor space that can be authorized in each one as a function of the difference between existing large store surface and the regional average. The Regional Law 16/2002 set similar limits.
- Sardinia: As other regional authorities, also the Sardinia authorities established quantitative limits for new large store openings in 2000-2003. These are expressed as a function of the ratio between existing square meters and population (Regional Regulation 6/10/2000). New constraints are included in the Regional Regulation 1/2004 and the Regional Law 5/2005.

Table 11: PAFS of the Italian provinces. Years 2000-2003.

Region	Province	PAFS	Region	Province	PAFS	Region	Province	PAFS
Piedmont	Torino	0	Emilia R.	Piacenza	0	Abruzzo	Chieti	0.049
Piedmont	Vercelli	0	Emilia R.	Parma	0	Molise	Campobasso	0.008
Piedmont	Novara	0	Emilia R.	Reggio E.	0	Molise	Isernia	0.006
Piedmont	Cuneo	0	Emilia R.	Modena	0	Campania	Caserta	0.049
Piedmont	Asti	0	Emilia R.	Bologna	0	Campania	Benevento	0.022
Piedmont	Alessandria	0	Emilia R.	Ferrara	0	Campania	Napoli	0.025
Piedmont	Biella	0	Emilia R.	Ravenna	0	Campania	Avellino	0.016
Piedmont	Verbano C.O.	0	Emilia R.	Forli' C.	0	Campania	Salerno	0.036
Val d'Aosta	Aosta	0.009	Emilia R.	Rimini	0	Apulia	Foggia	0.097
Lombardy	Varese	0.126	Tuscany	Massa C.	0.036	Apulia	Bari	0.287
Lombardy	Como	0.101	Tuscany	Lucca	0.045	Apulia	Taranto	0.085
Lombardy	Sondrio	0.031	Tuscany	Pistoia	0.03	Apulia	Brindisi	0.086
Lombardy	Milano	0.024	Tuscany	Firenze	0.032	Apulia	Lecce	0.149
Lombardy	Bergamo	0.116	Tuscany	Livorno	0.022	Basilicata	Potenza	0.038
Lombardy	Brescia	0.04	Tuscany	Pisa	0.067	Basilicata	Matera	0.01
Lombardy	Pavia	0.025	Tuscany	Arezzo	0.029	Calabria	Cosenza	0.055
Lombardy	Cremona	0.024	Tuscany	Siena	0.083	Calabria	Catanzaro	0.079
Lombardy	Mantova	0.014	Tuscany	Grosseto	0.064	Calabria	Reggio C.	0.104
Lombardy	Lecco	0.02	Tuscany	Prato	0.045	Calabria	Crotone	0.151
Lombardy	Lodi	0.033	Umbria	Perugia	0.056	Calabria	Vibo V.	0.137
Bolzano	Bolzano	0.021	Umbria	Terni	0.035	Sicily	Trapani	0.01
Trento	Trento	0.008	Marche	Pesaro U.	0	Sicily	Palermo	0.009
Veneto	Verona	0.043	Marche	Ancona	0	Sicily	Messina	0.011
Veneto	Vicenza	0.071	Marche	Macerata	0	Sicily	Agrigento	0.009
Veneto	Belluno	0.029	Marche	Ascoli P.	0	Sicily	Caltanissetta	0.006
Veneto	Treviso	0.09	Lazio	Viterbo	0.016	Sicily	Enna	0.023
Veneto	Venezia	0.11	Lazio	Rieti	0.012	Sicily	Catania	0.009
Veneto	Padova	0.07	Lazio	Roma	0.015	Sicily	Ragusa	0.013
Veneto	Rovigo	0.152	Lazio	Latina	0.009	Sicily	Siracusa	0.01
Liguria	Imperia	0.032	Lazio	Frosinone	0.02	Sardinia	Sassari	0.071
Liguria	Savona	0.021	Abruzzo	L'Aquila	0.038	Sardinia	Nuoro	0.071
Liguria	Genova	0.019	Abruzzo	Teramo	0.036	Sardinia	Cagliari	0.049
Liguria	La Spezia	0.031	Abruzzo	Pescara	0.018	Sardinia	Oristano	0.071

Source: Authors' calculations based regional regulations. Istat data on population. When two or more areas are located in the same province, the corresponding admissible floor space is the total. When an area extends over two provinces, the admissible floor space is assigned to the province whose territory includes the largest number of towns in the area. Bolzano and Lazio express the increase in total floor space as a percentage of existing floor space. To derive our measure of entry barriers we multiplied this increase by the total floor space reported in the census conducted by Italian Ministry of Industry and Trade. Apulia and Calabria set the maximum number of stores that could be licensed in each area. In order to get a measure of the corresponding floor space, we multiplied the number of openings allowed by the average surface of the large stores existing in a given area.