

# DISCUSSION PAPER SERIES

No. 6637

## ENTRY BARRIERS IN RETAIL TRADE

Fabiano Schivardi and Eliana Viviano

*INDUSTRIAL ORGANIZATION*



**C**entre for **E**conomic **P**olicy **R**esearch

[www.cepr.org](http://www.cepr.org)

Available online at:

[www.cepr.org/pubs/dps/DP6637.asp](http://www.cepr.org/pubs/dps/DP6637.asp)

# ENTRY BARRIERS IN RETAIL TRADE

**Fabiano Schivardi**, Università di Cagliari, EIEF and CEPR  
**Elia Viviano**, Banca d'Italia

Discussion Paper No. 6637  
January 2008

Centre for Economic Policy Research  
90–98 Goswell Rd, London EC1V 7RR, UK  
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999  
Email: [cepr@cepr.org](mailto:cepr@cepr.org), Website: [www.cepr.org](http://www.cepr.org)

This Discussion Paper is issued under the auspices of the Centre's research programme in **INDUSTRIAL ORGANIZATION**. Any opinions expressed here are those of the author(s) and not those of the Centre for Economic Policy Research. Research disseminated by CEPR may include views on policy, but the Centre itself takes no institutional policy positions.

The Centre for Economic Policy Research was established in 1983 as a private educational charity, to promote independent analysis and public discussion of open economies and the relations among them. It is pluralist and non-partisan, bringing economic research to bear on the analysis of medium- and long-run policy questions. Institutional (core) finance for the Centre has been provided through major grants from the Economic and Social Research Council, under which an ESRC Resource Centre operates within CEPR; the Esmée Fairbairn Charitable Trust; and the Bank of England. These organizations do not give prior review to the Centre's publications, nor do they necessarily endorse the views expressed therein.

These Discussion Papers often represent preliminary or incomplete work, circulated to encourage discussion and comment. Citation and use of such a paper should take account of its provisional character.

Copyright: Fabiano Schivardi and Elia Viviano

## ABSTRACT

### Entry Barriers in Retail Trade\*

The 1998 reform of the Italy's 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. Consistently, more stringent entry regulation results in higher inflation: lower productivity coupled with larger margins results in higher consumer prices.

JEL Classification: L11, L5 and L81

Keywords: entry barriers, productivity growth and technology

Fabiano Schivardi  
Università di Cagliari  
Viale Sant'Ignazio  
da Laconi 78  
I-09123 Cagliari  
ITALY  
Email: fschivardi@unica.it

Eliana Viviano  
Bank of Italy  
Department for Structural Economic  
Analysis  
Via Nazionale 91  
00184 Rome  
ITALY  
Email: eliana.viviano@bancaditalia.it

For further Discussion Papers by this author see:  
[www.cepr.org/pubs/new-dps/dplist.asp?authorid=145224](http://www.cepr.org/pubs/new-dps/dplist.asp?authorid=145224)

For further Discussion Papers by this author see:  
[www.cepr.org/pubs/new-dps/dplist.asp?authorid=158569](http://www.cepr.org/pubs/new-dps/dplist.asp?authorid=158569)

\* We thank Giovanni Seri of Istat for helping us with the System of Company Accounts (Sistema dei conti delle imprese) and Alberto Alesina, David Card, Luigi Guiso, Francesco Lippi, Francesca Lotti, Marcello Pagnini and participants at various seminars for useful comments. The views expressed here are our own and do not necessarily reflect those of the Bank of Italy.

Submitted 21 December 2007

# 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.<sup>1</sup> 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 and 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.<sup>2</sup> 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 labor 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 of the

---

<sup>1</sup>Already in the early 1990s, Baily (1993) claimed that the higher degree of liberalization is a major factor behind the higher labor 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 labor ...". 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 labor productivity.

<sup>2</sup>Other established 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).

problems that affect cross-country studies and draw some general lessons on the effects of regulatory barriers in services.<sup>3</sup>

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 or expansion of medium-large stores at the provincial level. We use cross-sectional variation in such 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.<sup>4</sup> The firm data come from the “System of Company Accounts”, a representative survey run by the National Institute for Statistics (Istat). We restrict the analysis to firms already in the market in the year the regulation came into effect as the survey is somewhat limited in terms of analyzing entry. In the basic specification, the effects of the entry barriers are identified using provincial 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 province at the 75<sup>th</sup> percentile of the barrier distribution recorded higher margins by about 16% with respect to those in the province at the 25<sup>th</sup> percentile. The same exercise for productivity implies a difference of about 5%.

---

<sup>3</sup>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).

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

We also find that greater competition increases the propensity to invest in ICT, even if the effect is less clear-cut than that on profits and productivity. 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). In particular, 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. 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 Local Regulation of Retail Trade**

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 move to decentralize 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, night openings, promotional activities and so on. Arguably, the most important aspect is the entry or enlargement of large stores. We focus the analysis on precisely this aspect, as entry barriers are the most effective instrument for restricting competition (Djankov, La Porta & Lopez-de Silanes 2001, Klapper, Laeven & Rajan 2006). Before the Bersani Law, opening either small or large outlets required a permit from the town council.<sup>5</sup> The Bersani Law defined three types of establishments: (1) small (also called neighborhood stores): up to 150 square meters; (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 “silence signifies assent”. The council has 60 days to stop the new opening, but only for a given set of reasons. Instead, a system of prior authorization holds for medium and large stores. 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.<sup>6</sup> The Italian regional governments were obliged to draw up their 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.<sup>7</sup>

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). First,

---

<sup>5</sup>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.

<sup>6</sup>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.

<sup>7</sup>During this period, large store openings were possible only if the corresponding permit was issued before March 1998.

no regional government met the deadline for issuing the regional regulation and all new local regulations were issued between the end of 1999 and 2000. As a consequence, from the inception of the Bersani Law in March 1998 until 2000, no new opening permits were issued. Second, only three regions, Piedmont, Emilia Romagna<sup>8</sup> and Marche, set general guidelines for the application procedure without any prior limit on the admissible floor space for new stores. The remaining 17 regions set stringent ceilings for entry, following a roughly similar approach. They divided the region into areas, broadly coinciding with the administrative provinces, and for each of them they established the maximum floor space for new large stores that could be authorized during the next 3-5 years.<sup>9</sup>

Entry ceilings can be used to construct ideal measures of entry restrictions. First, actual entry crucially depends on the attractiveness of the local market as well as on entry restrictions. Moreover, since it is predetermined, this variable also avoids the problems associated with other variables used in the literature, such as the share of rejected applications (Bertrand & Kramarz 2002).<sup>10</sup>

We examine each regional regulation and compute the maximum floor space that can be authorized for large store expansion in each province.<sup>11</sup> 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. To account for the size of the market, we take the ratio of the population (in thousands) to the admissible floor

---

<sup>8</sup>In 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. 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 flexible regulations. This choice does not affect the main results of the paper.

<sup>9</sup> Some regions explicitly set the time limit for their regional zoning plans, others did not indicate a period of validity for the limits.

<sup>10</sup> Applications depend on the applicant's assessment of the likelihood of being accepted, so that few applications might be submitted in regions where they are more likely to be rejected, making this indicator problematical.

<sup>11</sup> 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, Puglia 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.

space (henceforth, PAFS) in the province and use this variable as our preferred measure of entry barriers: the higher the ratio, the greater the entry restrictions. Correspondingly, we set the ratio to zero in the provinces of the 3 regions without pre-set limits.

There are very sizable differences in PAFS. They vary from a minimum of zero for the 3 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 3 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.

We also compute the ratio of the population to existing large store floor space in 2000 (thousand/sq.m.) and report it in Figure 2. These data are drawn from the data of the Italian Ministry of Industry and Trade, which has published aggregate data at the province level on large store floor space and employment since 1999. In fact, additional floor space could be correlated to the existing space: for example, there could be a catching-up process whereby the laggard regions choose a less restrictive regulation. We find no clear correlation between the existing floor space and the restrictions imposed by the regional boards. 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. 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.

### **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 “System of Company Accounts” (*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 sampling procedure divides them 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. The sample is stratified by region, sector and size of workforce.

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, for reasons of confidentiality, 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<sup>12</sup>) with no more than 100 employees for the period 1998-2004.<sup>13</sup> 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 99.9% of total retail firms (87.0% of total employees, 74.9% of total aggregate sales).

We have selected only firms born before 2000, i.e. already those operating when entry barriers were set up, for a total of more than 1,500 observations per year. We have excluded entrants after the reform because, up to 2004, only 22 medium-large stores born after 2000 are present in the survey, making it hard to assess the contribution of entrants. Moreover, it is well known that, due to start-up costs, time-to-build and selection effects, firms’ productivity right after entry is generally lower than that of incumbents (Foster, Haltiwanger & Krizan 2002), as full productive potential is realized only after a few years. We therefore

---

<sup>12</sup>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.

<sup>13</sup>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%.

restrict the analysis to incumbents, leaving consideration of the direct effects of entrants to future work, when a longer time series will be available.

The survey reports the number of workers, hours worked, labor costs, sales, investments, software expenditure and the administrative province where the main branch of the firm is located. Unfortunately, information is not available on either the number of establishments per firm (as well as other plant-level information) or the retail floor space. However, firms are required to report the number of employees working in stores located in regions other than that of main branch. To minimize geographical misplacement, we have selected only the firms with at least 50% of the workforce employed in the region of the main branch.

The barriers we are considering apply to large stores (see above). As long as there is some market segmentation between large, medium and small stores, we should expect that any effect of entry restrictions is stronger in the population directly affected by the regulation, i.e. large stores, and in its closest segment, i.e. medium-large stores, than in small ones. We therefore perform the analysis on two samples: the *total sample* (i.e. all firms with less than 100 employees, 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 (see footnote 11), 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.<sup>14</sup> According to Istat data (Istat 2004) these firms account for 10% of total retail sales. The final total sample amounts to more than 10,000 firms and the restricted one to more than 2,300 firms. Our restricted sample includes therefore some large stores, directly affected by the reform, and medium-large stores. Consequently, we focus on how barriers to entry for a specific type of firm, i.e. large stores, affects the performance of others (small and medium-large stores).

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 than in others.<sup>15</sup> Thus, we expect that “food and beverage”

---

<sup>14</sup>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 (Forthcoming) 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.

<sup>15</sup> 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”.

prices will depend strictly on the development of large stores.

Table 1 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 labor productivity. One problem with computing real sales is that different degrees of liberalization might imply differences in price inflation, making 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 distinct for the following groups of goods: (1) food and beverages; (2) clothing; (3) household equipment.<sup>16</sup> We have divided firms into the same 3 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).

### 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. Nonetheless, we still need to account for the possibility that entry restrictions are set in relation to pre-existing conditions or to expected developments in the local market. Consider the case of a province where profit margins are particularly large 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 2004. As discussed by Besley & Case (2000), fixed-effects

---

<sup>16</sup> COICOP classification: Codes, 01, 03 and 05.

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  $t$ ,  $D$  is a dummy equal to 1 for the years 2000-2004,  $PAFS_j$  is the indicator of entry barriers of area  $j$  following the inception of the Bersani Law,  $X_{ijt}$  are time-variant controls,  $T_t$ ,  $R_j$  and  $S_i$  are year, area (99 administrative provinces<sup>17</sup>) and 7 retail sub-sector dummies (ISIC at 3 digits) respectively;  $\varepsilon_{ijt}$  is an error term. Under the assumption that, conditional on the other controls, the  $PAFS$  indicator is uncorrelated with  $\varepsilon_{ijt}$ , the coefficient  $\alpha_1$  identifies the effect of entry barriers on  $y_{ijt}$ .

The fixed-effects approach controls for any fixed attribute that might determine policies and 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.<sup>18</sup> For example, the opening of a new highway might affect firms' productivity and profit margins and also influence regulation, as potential entrants exert political pressure to obtain building permits in the proximity of the new facility. Moreover, our barrier indicator might be affected by measurement error: first, the reform also delegated to regions other important aspects of regulation, such as opening hours and promotional activities;<sup>19</sup> moreover, we have no information on the attitude of regional boards to granting building permits. To account for both potential endogeneity and measurement error, we 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

---

<sup>17</sup>In Italy there are 103 provinces, of which 4 are located in Friuli Venezia Giulia and excluded from the sample.

<sup>18</sup>We consider the possibility of *aggregate* local factors below.

<sup>19</sup>Producing quantitative indicators of these aspects turns out to be very problematic, as opening hours can be made contingent on the specific characteristics of single towns and periods of the year, such as local festivities, holiday seasons in tourist areas, etc.

of  $\alpha_1$  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  $\alpha_1$  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,  $\alpha_1$  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  $\alpha_1$  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 2 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 (.75), with a p-value of .06. To better appreciate the effect, moving from the 25<sup>th</sup> (.00787) to the 75<sup>th</sup> (.05455) percentile of the PAFS distribution would increase margins by 3.5%, not a negligible effect. 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 the 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 3.44 and significant at 1%.

Going from the 25<sup>th</sup> to the 75<sup>th</sup> percentile of the PAFS distribution would increase profits by around 16%, 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. All in all, 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 labor 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 3, organized as previously. In the total sample, the estimated coefficient on the PAFS indicator is negative (-.59) with a p-value of .06. 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 (-1.12) and is significant at 5% (p-value of .04). 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 9%. 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 major 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.<sup>20</sup>

We address this issue by using the probability of having non-zero expenditure on ICT.<sup>21</sup> The results of the probit regressions are shown in Table 4, where we report the marginal effects. We find support for the hypothesis that competition fosters ICT adoption, even if the evidence is not clear-cut. In the total sample there is a negative correlation between entry barriers and the probability of positive ICT investment, significant at 10%. The estimated coefficient becomes larger in absolute value in the total sample, but the precision of the estimates deteriorates (p-values of .22 in the two regressions). 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. More surprisingly, we find a positive correlation between the unemployment rate at the local level and adoption propensity.

#### 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, 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 2004. 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

---

<sup>20</sup>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.

<sup>21</sup>We have also experimented with ICT expenditure over sales, finding similar results.

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 5. 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<sup>th</sup> to the 75<sup>th</sup> percentile of the PAFS distribution would increase prices by approximately half a percentage point. 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 some evidence of a classical Philips curve: 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.<sup>22</sup>

The results of this section clearly indicate that entry barriers affect economic performance as expected. In what follows, we show that the results are robust with respect to a series of potential pitfalls of our basic regressions. For brevity's sake and, for some checks, owing to data problems,<sup>23</sup> we restrict the robustness analysis to the two most important performance indicators, profit margins and productivity.

## 5 Instrumental Variables

In this section we pursue an instrumental variable approach to account for the possibility that regulation is correlated with local, time-varying shocks to the retail sector. As argued above for the new infrastructure example, there might be events unobserved by the econometrician that influence both regulation and firms' performance. 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 an upward bias of the fixed-effects estimates; on the other, the regulator might be more willing to liberalize entry if the sector

---

<sup>22</sup>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.

<sup>23</sup>Data on ICT expenditure are not collected before 1998. Data on regional price indexes are not available before 1996.

is expected to earn large profits in the future (and vice versa): this would imply that the fixed-effects estimates are biased downwards. A second potential problem addressed by IVs is measurement error in the PAFS indicator, which would result in downward biased estimates.

We exploit 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.<sup>24</sup> 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 in which 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,<sup>25</sup> 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 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 6. A larger representation of the parties of the extreme right is clearly conducive to a more stringent regulation; the correlation with

---

<sup>24</sup>Extreme left-wing parties include: Rifondazione Comunista and Verdi; extreme right-wing parties include Movimento sociale, Alleanza Nazionale and Lega Nord.

<sup>25</sup>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 left is less clear-cut, as the linear term has a negative and the quadratic a positive coefficient. One problem with interpreting these results is collinearity: the electoral shares of the extreme left and the extreme right tend to be correlated across provinces. In any case, the indicators are jointly significant (with a partial R-squared higher than .20 in all regressions), supplying additional exogenous variability to the entry barrier indicator.

The following columns of Table 6 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 higher than the fixed-effects ones: marginally in the restricted sample (3.6 vs. 3.4), substantially in the total sample (3.1 vs. .75). A very similar pattern occurs for the productivity regressions: the coefficients are negative and significant, and increase in absolute values compared with the fixed-effects estimates (from -.59 to -2.5 in the full sample and from -1.12 to -2.24 in the restricted one). The standard Sargan statistics on the validity of excluded instruments are passed in all cases. Table 6 also reports the Anderson-Rubin test for the null hypothesis that the coefficient on PASF is statistically not different from zero. This test is robust to potentially weak instruments.<sup>26</sup> The Anderson-Rubin test confirms that the coefficients on PASF are always significant (at least at 10%).

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 much 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 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.

---

<sup>26</sup> Calculated according to 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.

## 6 Robustness Checks

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. We focus on the restricted sample, where the effects were stronger in our baseline exercise, and for which we are therefore more likely to find evidence against the causal interpretation of our empirical findings (results using the total sample are similar).

### 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 design of the System of Company Accounts 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 16 employees, amounts to 9,501 observations.

The results are reported in Table 7.<sup>27</sup> We split the period 1993-1997 in two, 1993-1994 and 1995-1997, and check for correlated differences in trends before the Bersani Law. 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.

---

<sup>27</sup>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 at least 16 employees (but experimented with other thresholds, finding no differences). Table 8 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 and both in the hotels and restaurants and in the other (low-wage) service sectors.

Overall, these results indicate that profit margins and productivity in these similar 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.

## 6.3 Further Checks

In unreported regressions we have experimented with several variations of our basic specification. First, 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. We find that they are seldom significant and have no 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 barrier for each year after 1999 gives very imprecise results, as the sample used for each estimate is too small to get good 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.

## 7 Conclusions

The lack of competition in the service sector has long been recognized as one of the structural weaknesses of the European economy (Barca & Visco 1992, 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 incumbents' 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 political fierce opposition to liberalization policies.

In terms of future research, the above conclusions clearly indicate that the political economy aspects of regulation are key to understanding how liberalization should be pushed through the political agenda. Alesina & Giavazzi (2007) argue that it is important to convince left-wing parties that liberalizations are especially beneficial for low-income people. This argument is clearly in line with the available evidence for retail trade. We have shown that consumers enjoy lower prices if entry is liberalized and Bertrand & Kramarz (2002) and Viviano (Forthcoming) that liberalization increases employment. Nothing is known about the effects on wages: in principle, wages could both increase, due to higher labor demand, and decrease, according to rent sharing arguments. This is something we plan to tackle in future work.

## References

- AGCM (2007), Qualità della e performance economiche a livello regionale: il caso della distribuzione in Italia. Studi e ricerche, Autorità Garante delle Concorrenza e del Mercato.
- Aghion, P., Blundell, R., Griffith, R., Howitt, P. & Prantl, S. (2005), The effects of entry on incumbent innovation and productivity. CEPR DP 5323.
- Ahn, S. (2002), Competition, innovation and productivity growth: A review of theory and evidence. OECD Economics Department Working Papers No.317.
- Alesina, A., Ardagna, S., Nicoletti, G. & Schiantarelli, F. (2005), ‘Regulation and investment’, *Journal of the European Economic Association* **3**, 791–825.
- Alesina, A., Ardagna, S. & Trebbi, F. (2006), Who adjusts and when? On the political economy of stabilizations. IMF Staff Papers, Mundell-Fleming Lecture, 53: 1-49.
- Alesina, A. & Giavazzi, F. (2007), *Il Liberismo è di Sinistra*, Il Saggiatore.
- Baily, M. (1993), ‘Competition, regulation, and efficiency in services industries’, *Brookings Papers: Microeconomics* **2**, 71–130.
- Barca, F. & Visco, I. (1992), L’economia italiana nella prospettiva europea: terziario protetto e dinamica dei redditi nominali, in S. Micossi & I. Visco, eds, ‘Inflazione, concorrenza e sviluppo’, Società Editrice il Mulino.
- Bernard, A., Jensen, J. & Schott, P. (2006), ‘Trade costs, firms and productivity’, *Journal of Monetary Economics* **53**.
- Bertrand, M. & Kramarz, F. (2002), ‘Does entry regulation hinder job creation? Evidence from the French retail industry’, *The Quarterly Journal of Economics* **117**, 1369–1413.
- Besley, C. & Case, A. (2000), ‘Unnatural experiments? Estimating the incidence of endogenous policies’, *Economic Journal* **110**, F672–F694.
- Djankov, S., La Porta, R. & Lopez-de Silanes, F. and Shleifer, A. (2001), The regulation of entry. CEPR DP 2953.
- Fabiani, S., Schivardi, F. & Trento, S. (2005), ‘ICT adoption in Italian manufacturing: Firm-level evidence’, *Industrial and Corporate Change* **14**, 225–249.
- Foster, L., Haltiwanger, J. & Krizan, C. (2002), The link between aggregate and micro productivity growth: Evidence from retail trade. NBER WP 9120.
- Gaiotti, E. & Lippi, F. (2004), ‘Pricing behavior and the introduction of the euro: evidence from a panel of restaurants’, *Giornale degli Economisti e Annali di Economia* **63**, 491–526.

- Gordon, R. (2004), Why was Europe left at the station when America's productivity locomotive departed? NBER WP 10661.
- Guiso, L., Sapienza, P. & Zingales, L. (2004), 'Does local financial development matter?', *The Quarterly Journal of Economics* **119**, 929–969.
- ISAE (2002), La liberalizzazione del commercio al dettaglio: una prima verifica. Rapporto Trimestrale ISAE.
- Istat (2004), I conti economici delle imprese. Collana di informazione, n. 19.
- Klapper, L., Laeven, L. & Rajan, R. (2006), 'Entry regulation as a barrier to entrepreneurship', *Journal of Financial Economics* p. 591629.
- Leibenstein, H. (1966), 'Allocative vs. "X-Efficiency"', *American Economic Review* **56**, 392–415.
- Mayer, N. (1986), *La boutique contre la gauche*, Paris, Press de la Fondation Nationale de Sciences Politiques.
- Melitz, M. (2003), 'The impact of trade on intra-industry reallocations and aggregate industry productivity', *Econometrica* **71**, 1695–1725.
- Moreira, M. (2003), 'A conditional likelihood ratio test for structural models', *Econometrica* **71**, 1027–1048.
- Nicoletti, G. & Scarpetta, S. (2003), 'Regulation, productivity and growth: OECD evidence', *Economic Policy* pp. 11–72.
- Schivardi, F. & Torrini, R. (Forthcoming), 'Identifying the effects of firing restrictions through size-contingent differences in regulation', *Labour Economics* .
- van Ark, B., Inklaar, R. & McGuckin, R. (2002), Changing gear, productivity, ICT and services industries: Europe and the United States. Groningen Centre for Development and Growth, Research Memorandum GD-60.
- van Ark, B., Monnikhof, E. & Mulder, N. (1999), 'Productivity in services: an international comparison', *Canadian Journal of Economics* **32**, 471–499.
- Viviano, E. (Forthcoming), 'Entry regulations and labor market outcomes: Evidence from the Italian retail trade sector', *Labour Economics* .

Table 1: Summary statistics

		<b>Sample:</b>			
		All firms		16+ employees	
		Pre	Post	Pre	Post
		Profit margins			
Mean		-2.15	-2.09	-3.19	-3.03
St. Dev.		0.04	0.03	0.08	0.05
		Productivity			
Mean		9.02	9.02	9.2	9.1
St. Dev.		0.05	0.02	0.04	0.03
		Probability of ICT spending			
Mean		0.15	0.14	0.57	0.44
St. Dev.		0.01	0.01	0.05	0.02
		Firm size			
Mean		1.06	1.06	3.27	3.29
St. Dev.		0.02	0.01	0.03	0.02
Sample size		2,791	8,305	592	2,156

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.

Table 2: Profit margin regressions

	<b>Sample:</b>			
	All firms		16+ employees	
PAFS	.75 (.06)	.75 (.06)	3.44 (.00)	3.44 (.00)
Initial space		-.51 (.70)		.05 (.99)
Firm size	-.36 (.00)	-.36 (.00)	-.18 (.00)	-.18 (.00)
Unemployment rate	.14 (.80)	.14 (.80)	-1.13 (.40)	-1.13 (.40)
$R^2$	.27	.27	.19	.19
Sample size	10,052	10,052	2,375	2,375

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 (7), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 3: Productivity regressions

	<b>Sample:</b>			
	All firms		16+ employees	
PAFS	-.59 (.06)	-.59 (.06)	-1.12 (.04)	-1.11 (.05)
Initial space		-.87 (.48)		-5.39 (.00)
Firm size	.00 (.99)	.00 (.99)	.09 (.00)	.09 (.00)
Unemployment rate	-.66 (.14)	-.66 (.14)	-.52 (.41)	-.54 (.43)
$R^2$	.13	.13	.20	.20
Sample size	9,995	9,995	2,125	2,125

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 (7), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 4: Probability of positive ICT spending regressions

	<b>Sample:</b>			
	All firms		16+ employees	
PAFS	-.16 (.07)	-.17 (.07)	-.33 (.22)	-.33 (.22)
Initial space		-.25 (.54)		-1.42 (.34)
Firm size	.09 (.00)	.09 (.00)	.13 (.00)	.13 (.00)
Unemployment rate	.48 (.02)	.48 (.02)	1.24 (.02)	1.25 (.02)
Pseudo $R^2$	.17	.17	.09	.09
Sample size	10,077	10,077	2,363	2,363

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 (7), province (99) and sub-sector (7) dummies. P-values adjusted for clustering at the level of the province in brackets.

Table 5: Price regressions

	<b>Sample:</b>	
	Regional administrative capital	
PAFS	.112 (.00)	.112 (.00)
Initial space		-.11 (.76)
Unemployment rate	-.105 (.044)	-.107 (.044)
$R^2$	.97	.97
Sample size	171	171

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. after 1999). P-values adjusted for clustering at the level of the region in brackets.

Table 6: IV regressions

	<b>First stage</b>	<b>Second stage</b>			
		<b>Profit margins</b>		<b>Productivity</b>	
		All firms	16+	All firms	16+
PAFS		3.09 (.00)	3.54 (.06)	-2.48 (.00)	-2.24 (.06)
Firm size	-.0003 (.08)	-.36 (.00)	-.11 (.00)	.00 (.88)	.08 (.00)
Unemployment rate	-.12 (.00)	.42 (.47)	-1.56 (.15)	-.91 (.06)	-1.00 (.12)
Share of votes to right parties	.01 (.00)				
Share of votes to right parties <sup>2</sup>	-.0001 (.00)				
Share of votes to left parties	-.06 (.00)				
Share of votes to left parties <sup>2</sup>	.0023 (.00)				
Partial R-squared	.21				
R2		0.27	0.23	0.13	0.19
Sample size	10,052	10,052	2,283	9,995	2,125
Sargan statistics		4.93	5.73	3.07	4.64
(p-value)		.18	.13	.38	.20
Anderson-Rubin statistics		15.54	9.35	13.71	8.49
H0: $\alpha_1 = 0$					
(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 fourth 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 (7), province (99) and sub-sector (7) dummies. P-values in brackets.

Table 7: Pre-reform regressions (1993-97)

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

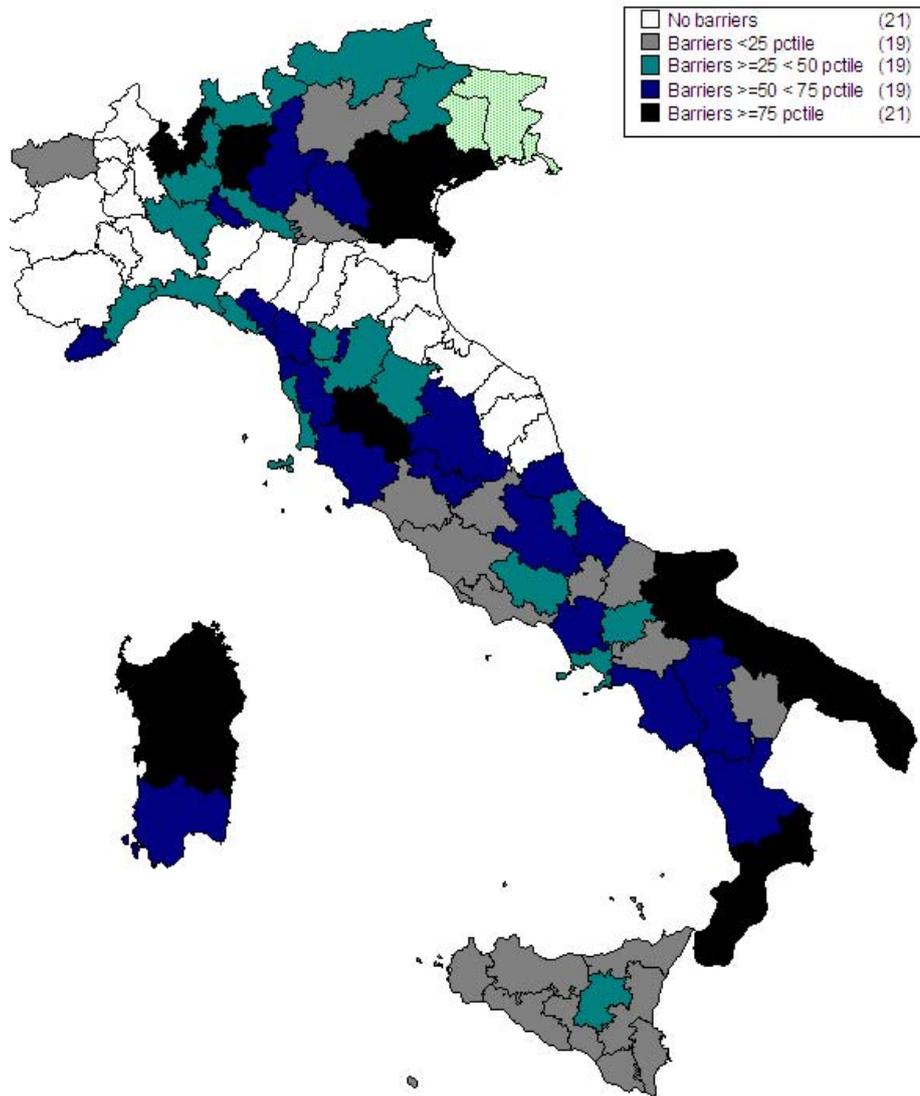
The dependent variable is the log of gross operating surplus over total sales at the level of the firm in the first column and the log of real sales over hours worked in the second. Because of data constraints the sample refers to firms with 20+ employees. PAFS is population over additional floor space, 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 8: Profit margins and productivity in other service sectors

	<b>Hotels</b>		<b>Other Services</b>	
	<u>Prof. marg.</u>	<u>Prod.</u>	<u>Prof. marg.</u>	<u>Prod.</u>
PAFS	-.28 (.80)	.03 (.97)	.55 (.52)	.33 (.49)
Firm size	-.33 (.00)	-.07 (.03)	-.2 (.00)	-.16 (.00)
Unemployment rate	3.03 (.33)	.02 (.99)	-2.31 (.12)	-.1 (.92)
$R^2$	.17	.17	.08	.24
No.	1,226	1,390	2,439	2,927

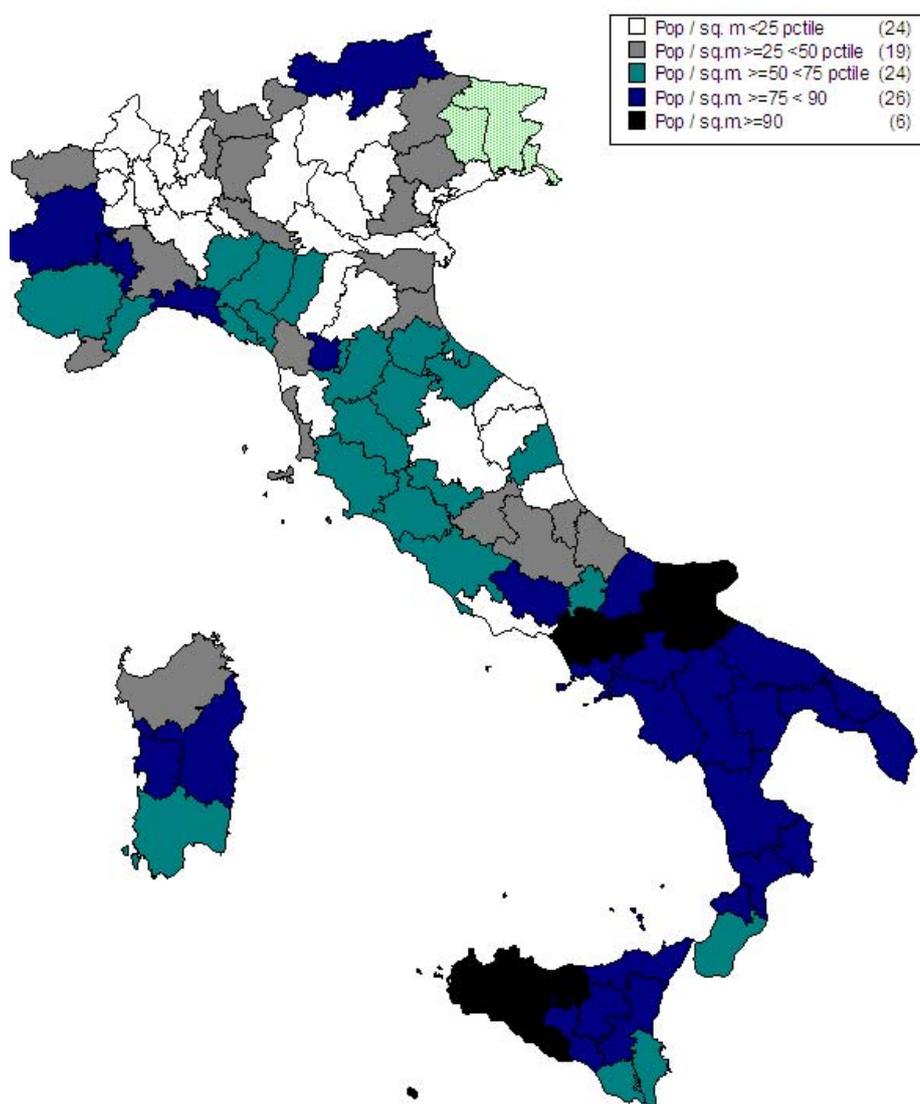
The dependent variable is the log of gross operating surplus over total sales at the level of the firm in the first and third columns and the log of real sales over hours worked in the second and fourth column. PAFS is population over additional floor space, set to zero for provinces without pre-set limits and interacted with a dummy equal to 1 in the post-reform period (ie. 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.

Figure 1: PASF in Italian provinces



PASF 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 calculation 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 calculation based on data of the Ministry of Industry and Trade.