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Technical Appendix to

ENTRY BARRIERS IN RETAIL TRADE

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Appendix

A. *Regional Regulations*

In this section we detail the procedure followed to construct our PAFS indicator. The values used in the paper for each province are reported in Table A.1. 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 2000–3 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 2000–2. 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 are undivided. The laws state that these limits are calculated on the basis of the ratio of existing square metres 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 2003–5 (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 sets 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 2000–1 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 2002–6 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 authorised 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 centres (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 2000–2 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 metres. 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 2000–5. 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 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 2003–5.

- 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 authorised 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 authorised during the period 2000–2. 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 2003–5.
- Apulia: The law 24/99 and the regulation 1843/99 set limits to the number of new openings for the period 2000–3 (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 2004–7. 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 27 in the period 2000–4. 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 authorised 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 2000–3. These are expressed as a function of the ratio between existing square metres and population (Regional Regulation 6/10/2000). New constraints are included in the Regional Regulation 1/2004 and the Regional Law 5/2005.

Table A.1
PAFS of the Italian Provinces: Years 2000–3

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	0.030	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	0.040	Tuscany	Pisa	0.067	Basilicata	Matera	0.010
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	0.020	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	0.010
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	0.090	Lazio	Viterbo	0.016	Sicily	Enna	0.023
Veneto	Venezia	0.110	Lazio	Rieti	0.012	Sicily	Catania	0.009
Veneto	Padova	0.070	Lazio	Roma	0.015	Sicily	Ragusa	0.013
Veneto	Rovigo	0.152	Lazio	Latina	0.009	Sicily	Siracusa	0.010
Liguria	Imperia	0.032	Lazio	Frosinone	0.020	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 at the level of province in year 2000. See Section A for the details on the calculation of the entry ceilings.

B. *Data Details*

Company Accounts System. The survey is representative of the firm population. The sample is stratified by region, sector and size of the workforce. 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. From 1998 Istat conducts the survey according to EU Regulation 58/97 ('Structural Business Statistics', SBS). According to this regulation, the SBS surveys must be fully representative at the local level and for some firm class-size (typically 1–9 workers, 10–19, 20–49 and 50+). As a consequence in 1998 the sampling of firms across regions changed, as from 1993 to 1997 the sample over-weighted firms located in the Northern regions. Comparability of information over time is then unwarranted. The response rate is on average around 40%. Firms must have entered the market at least one year before the reference period. Since the interview mainly collects data on the previous year's balance sheet, the

survey refers in facts to firms operating for at least two years before the interview. We have excluded the subsectors 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 and subject to additional regulation. We have also excluded retail sales not carried out in stores and data referred to firms located Marche in 2003, as in this region in 2003 all new store openings were stopped after a drastic change in the local regulation.

The quality of the information is high, as Istat carries out several internal consistency checks, comparisons with official balance-sheet data and a second round of interview in case of reporting anomalies. It also integrates missing data whenever possible. Istat provides also a direct measure of the gross operating surplus, corrected and with imputed values (including also of the compensation of self-employed). We use the corrected one, which -for retail trade firms- has only non-negative values. If instead we directly construct the gross operating surplus from raw data (value added minus personnel costs divided by turnover), approximately 8% of the observations relate to negative or zero values, which are lost when taking logs. We have replicated all the results with raw data in levels finding similar results.

In terms of the coverage of the sample, according to aggregate statistics published by Istat and based on the same data (Istat, 2004), in 1998 firms with more than 100 employees represented 1% of total retail firms, 17% of total employees and 25% of total aggregate sales (see Table B2). Our estimates with small and medium–large firms refer then to a sizeable share of the market and they capture how these firms react to entry restrictions applied large competitors.

Ideally, one would need store level data, as multi-plant stores might span multiple provinces. According to the data of the Ministry of Industry and Commerce, almost 80% of total retail trade stores are single-plant. Among firms with 1–100 employees, multi-plant firms are just 7% (17% of sales, 14% of total employment, see Table B.2), whereas multi-plant firms are mainly food mega-stores not included in our sample. 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. Nevertheless, we have also run all our estimates on single-shop firms, obtaining very similar results. 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 avoid geographical miss-assignment ideally we would need to select only those firms with the majority of the workforce located in the same province (not the region) of the headquarter. To the best of our knowledge in Italy there is no dataset with information on the location of local units and of the corresponding headquar-

Table B.2

The Structure of the Italian Retail Trade Sector: Share of Firms, Sales and Workers by Size Class (1–99 and 100+) and Type of Firm, Year 1998 (percentages)

	Number of firms	Sales	Number of workers
Firms 100+ employees[(1)]	0.05	20.88	12.96
Firms 1–99 employees[(2)]	99.95	79.12	87.04
Of which:			
–Single plant	*92.73*	*62.17*	*72.73*
–Chains	*7.22*	*16.95*	*14.31*
Of which:			
– Chains with at least 90% workforce in region of headquarter	*7.20*	*16.56*	*14.09*

Source and notes. Authors' calculations. ([1]) Based on Istat data (*Company Accounts System*) aggregate data. ([2]) Based on Istat data (*Company Accounts System*) micro data. Chains are defined as firms with more than 1 local unit.

ters. As a consequence we cannot assess directly what the effects of this miss-assignment are. However, in Italy the plants of a multi-plant firm 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 (see Table B.2).

Italian Ministry of Industry and Commerce data. Data from the Italian Ministry of Industry and Commerce are available at http://www.attivitaproduttive.gov.it/osservatori/commercio/indice_grande_distribuzione.htm. The Ministry on Industry and Commerce also publishes data on the flow of new floor space at the province level. However, these data are not regularly updated and are not reliable, as admitted in the documentation attached to the data: http://www.attivitaproduttive.gov.it/osservatori/commercio/flussi_sede_fissa/nota.pdf.

Price data. The sectoral classification of price index data differs from the one of firms. Price indexes are collected for the following groups of goods: (1) food and beverages; (2) clothing; (3) household equipment. We have divided firms into the same three groups according to the type of good sold (derived from their ISIC classification) and deflated firms' nominal sales by the yearly average of the corresponding regional consumer price indexes.

Labour force survey. The LFS sample size is approximately 200,000 individuals, interviewed each quarter (January, April, July and October) and it is fully representative of the resident Italian population. Individuals are required to report their working status, sector of employment, whether salaried, self-employed or unpaid family workers and the total number of employees working in the same local unit as the interviewee. The basic sample units are *de facto* households. The sampling procedure is a two-stage one: the first stage consists of the selection of towns, which are divided into strata. All towns of the same administrative province are divided into two classes according to the population size of the town: above and below 20,000. All towns in the first group are sampled, while two towns in the second group are selected at random. The final LFS sample consists of more than 1,300 towns and 70,000 households on average. The empirical analysis presented in this paper is based on rich LFS files referred to the April wave, kindly provided by Istat, which, compared to the standard public-use files, report information on both the province of residence and the size of the units where people work. Size is collected as a categorical variable. Categories are: (1) single worker unit, (2) 2–5 workers, (3) 6–9 workers, (4) 10–15 workers, (5) 16–19 workers, (6) 20–50 workers, (7) 50–199 workers, (8) 200–500 workers, and (9) 500+ workers.

C. *Robustness Checks*

We have run regressions including firm size, measured by the log number of workers, as a control. 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 liberalisation. The results are similar to those in Table 5 in the main text. Given that liberalising 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 and 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 have used alternative controls for local economic conditions, such as value added per capita, which should measure any aggregate changes in productivity. We found no significant change with respect to the basic specifications.

We have also tested the robustness of the results with respect to a series of modifications to the basic specification. 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 5 in the main text.

One might argue that PAFS are more effective at restraining competition in provinces 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, we have split the sample according to the value of the province population density (residents per square kilometre 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 changed the employment threshold that defines a large store, using 16 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, arguably because of small sample problems. 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 2000–2) and 1998–2004 (the dummy D is equal to 1 for the years 2000–4), 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 Table 5 in the main text.

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