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CONSUMER INERTIA AND FIRM INCUMBENCY IN LIBERALISED RETAIL ELECTRICITY MARKETS: AN EMPIRICAL INVESTIGATION

November 2021

Marco Fanno Working Papers – 277

Consumer inertia and firm incumbency in liberalised retail electricity markets: an empirical investigation ^{*}

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11th August 2021

Abstract

By exploiting an original 4-year dataset on the Italian retail electricity market, we investigate the relationship between firm incumbency — measured by market concentration at the regional level — and consumer inertia — identified by the yearly percentage of consumers switching providers and/or contract, both from the regulated to the free market and within the free market. Our main results show that i) regions recording stronger firm incumbency exhibit larger consumer inertia in leaving the regulated market, this effect being reinforced by the number of active free market retailers; ii) switching by consumers who already are in the free market is, instead, positively affected by firm incumbency. In light of these results, we provide prescriptions for policymakers targeting the migration of consumers towards free-market contracts and, consequently, full energy market liberalisation.

KEYWORDS: Electricity Retail Markets; Liberalisation in Electricity Markets; Incumbency; Consumer Behaviour.

JEL CODES: D12; L11; L94; L98; Q48.

^{*}We are indebted to ARERA for providing us with original data on the Italian electricity market. We thank Marco Bertoni, Roberto Bonfatti, Riccardo Camboni, Marta Chicca, Cesare Dosi, Gabriella Facchetti, Fulvio Fontini, Leonardo Madio, Fabio Manenti, Federico Navarra, Orestis Troumponis, and participants of the seminars at the University of Padova for their useful comments on previous versions of the paper. This work has received the financial support of the Dept. of Economics and Management, University of Padova.

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1 Introduction

Liberalisation of energy retail markets is currently on-going in many countries. This process has been undertaken in order to both enhance economic efficiency and innovation and reduce prices paid by consumers. To be effective, liberalisation requires, on the supply side, a certain degree of competition among firms and, at the same time, on the demand side, consumer awareness and engagement, as search behaviour might be essential to achieve optimal outcomes (Waterson, 2003). Energy retail markets have often been characterised by firm incumbency, either at the national or at the local level (Martimort et al., 2020; Stagnaro et al., 2020), largely coming along with vertical integration of the energy supply chain (Michaels, 2006). Considering the current liberalisation process, the inherited incumbency can, on the one hand, deter entry and growth of newer firms; and, on the other hand, it can frustrate consumer choice of energy providers, yielding to the so-called *consumer inertia*.

By exploiting an original longitudinal dataset spanning 4 years (2015–2018) on the Italian retail electricity market, we investigate the (causal) relationship between firm incumbency, proxied by different measures of market concentration, and consumer inertia, in terms of (low) switching rates. To this end, we use the percentage of consumers changing providers and/or contract as the outcome variable. Specifically, we record i) switching rates from the regulated to the free market; ii) switching rates from the regulated to the free market involving migrations towards providers of a different holding company with respect to the incumbent; iii) switching rates within the free market and iv) switching rates to another energy contract with the same provider (i.e., internal switching). These detailed measures of switching permit us to unravel the underlying mechanisms which connect consumer choice to market structure (incumbency) for electricity contract provision.¹

The Italian electricity market provides an excellent setting where to investigate retail choices, as it shares many features with other countries undergoing electricity market liberalisation. Energy providers have been offering free market contracts to Italian firms (business consumers) since early 2000 and to households (residential consumers) since 2007. Household and small business consumers that have yet to switch to the free market stay in the regulated

¹Note that consumer switching behaviour in one market can determine effects on their choices in other retail markets, as highlighted by Harold, Cullinan and Lyons (2020). The present detailed empirical analysis on the Italian electricity market does not cover these cross-market effects.

market (known as *servizio di maggior tutela*, i.e., greater protection service). Under the regulated regime, consumers can only be offered a default contract, provided by the incumbent and characterised by a price set — and updated every 3 months — by the Italian Regulatory Authority for Energy, Network and the Environment (Regulator or ARERA, hereafter), which is also in charge of setting standard contractual conditions. However, consumers have the opportunity to switch from the regulated contract to one of the several providers active in the free market. In order to standardise information about energy offers and enhance awareness during the search process, ARERA implemented tools such as a public and free price comparison website and transparency rules providers must follow when offering a new contract to consumers.² Latest data on the Italian electricity market suggest strong evidence of consumer inertia: as of September 2020, about 44% of households and 32% of business consumers were still under the regulated electricity contract (ARERA, 2021a).³ Thus, switching to the free market has been characterised by anemic rates — on average, around 3-4% per year, even in recent years. These data call for an urgent action by policymakers especially considering that regulated prices were phased out for small-and-medium enterprises in January 2021 and will be eliminated for households and micro-businesses in 2023.

By estimating an OLS regression model on observations at the regional level, we find that areas recording higher market concentration exhibit higher inertia in terms of fewer consumers leaving the regulated market. On the other hand, market concentration is associated with higher switching by consumers who are already in the free market (i.e., *switching within the free market* and *internal switching*). We also find consumer delinquency to positively affect the switching rate within the free market, which validates the Regulator’s claims about delinquent consumer habit of switching supplier to avoid paying unpaid bills (ARERA, 2009, 2020a).

Our results contribute to two main strands of the literature. First, we add to empirical studies focusing on retail choice in utilities.⁴ Giuliotti et al. (2014) develop and estimate an equilibrium model of search costs to investigate price dispersion in the British electricity

²See: ARERA Document №51/2018/R/EEL on the establishment of the price comparison website (*Portale Offerte Luce e Gas*) and ARERA Document №426/2020/R/EEL on transparency rules suppliers must abide to when selling new contracts (*Codice di condotta commerciale*).

³Note that in 2012 these percentages were 79 and 63 percent for the households and business consumers respectively. While more promising, data in the gas market return similar results.

⁴See, among others, Miravete (2003) in the telecommunication sector, Giuliotti et al. (2005) on the provision of natural gas and Wilson and Price (2010) for electricity.

market. [Hortaçsu et al. \(2017\)](#) exploit a retail programme in Texas residential electricity market to measure choice frictions: they find that consumer inertial behaviour is driven by inattention and by incumbent brand effect. Looking at market data in Connecticut, [Tsai and Tsai \(2018\)](#) show that energy providers were anchoring their prices to regulated prices — rather than wholesale prices — and that a sizable portion of consumers was switching back to such regulated contracts despite better alternatives in the liberalised market. Our results add detailed evidence on the role of firm incumbency on consumer behaviour and, consequently, on market dynamics on the demand side.

Second, we contribute to the literature on determinants of switching costs in utilities.⁵ Following liberalisation in energy retail markets in many countries, recent literature highlights how *monetary* and *non-monetary* attributes affect switching behaviour for (largely) homogeneous goods — such as electricity and gas. As for monetary attributes, economic savings from changing providers propel switching behaviour, even though in the energy markets price differences are typically small and longer-term savings might be more salient within consumer decision-making process ([Giulietti et al., 2005](#); [Yang, 2014](#); [Brown, Tsai, Woo, Zarnikau & Zhu, 2020](#)). In terms of non-monetary attributes, determinants of switching behaviour are bundling electricity with gas, the absence of nuclear energy in the fuel mix ([Shin & Managi, 2017](#)); the length of time over which prices are guaranteed, the proportion of renewable energy sources ([Gärling, Gamble & Juliusson, 2008](#); [Dressler & Weiergraber, 2019](#); [Ndebele, Marsh & Scarpa, 2019](#)); whether switching had occurred in another market ([Harold et al., 2020](#)), in addition to the stability and the quality of the provider and its customer care ([Yang, 2014](#); [Shin & Managi, 2017](#); [Ndebele et al., 2019](#)). Finally, market structure could also be a factor in affecting consumer behaviour: higher concentration seems to frustrate switching behaviour ([Giulietti et al., 2005](#); [Fontana, Iori & Nava, 2019](#); [Schleich, Faure & Gassmann, 2019](#)), while the number of providers has a positive effect ([Schleich et al., 2019](#); [Watson, Huebner, Fell & Shipworth, 2020](#)). In fact, a provider’s market share — if publicly known — can also be a signal of trustworthiness ([Gärling et al., 2008](#)). Supposedly, competition intensity affects switching behaviour directly — through less choice and stronger market power by incumbents ([Stagnaro et al., 2020](#)); and indirectly — by means of higher prices ([Ghazvini, Ramos, Soares,](#)

⁵Consumer switching behaviour has been under scrutiny for decades in a variety of sectors ([Harold et al., 2020](#)), especially those with differentiated products, such as telecoms ([Knittel, 1997](#); [Shy, 2002](#)), insurance ([Schlesinger & Von der Schulenburg, 1991](#); [Honka, 2014](#)), banking ([Shy, 2002](#); [Egarius & Weill, 2016](#)) and airlines ([Carlsson & Löfgren, 2006](#)).

Castro & Vale, 2019; Brown, Zarnikau, Adib, Tsai & Woo, 2020). To all these results we add novel empirical findings on how incumbency affects consumer choice, with detailed effects on switching provider and/or contract in the electricity retail market.

In the remainder of this paper, we first illustrate the structure and evolution of the Italian retail electricity market our empirical analysis refers to (Section 2). In Section 3, we discuss the relevant literature on consumer switching in energy market and firm incumbency, along with the research hypotheses to be tested in the present contribution. Section 4 describes our dataset and the empirical methodology we adopt. Our results are presented in Section 5, Section 6 discusses policy implication and is followed by concluding remarks (Section 7).

2 The Italian retail electricity market

In order to fully understand the role of historical firm incumbency on current market dynamics, in this section we briefly describe the evolution of the Italian electricity market. We first present the main historical features of the national electricity market and then we illustrate the liberalisation process, which started with the EU Directive 96/92/EC in 1996 and, at this time, is expected to be fully realised in 2023. Note that the transition of the Italian electricity market towards a full liberalisation shares many elements with the transition occurring in other European countries, such as the simultaneous presence of regulated and free market contracts and the presence of incumbents across the national territory (Martimort et al., 2020).

Main historical features - Before the early Sixties, electricity was produced and distributed by small and medium firms scattered throughout the Italian territory: these firms were connected and controlled by a few — often regional — larger companies and consortia.⁶ In order to enhance the coordination of these fragmented networks and, consequently, stimulate investments to strengthen energy production and transmission at the national level, a single public institution for electricity was established in 1962, namely *Ente nazionale per l'energia elettrica* (*ENEL*).⁷ This large national body was entrusted with the activities of production, import/export, transport, transformation, distribution and sale of electricity. *ENEL* lasted thirty years in the form of a vertically integrated monopoly (Soda & Carlone, 2013) and its

⁶E.g., Edison, SADE, SIP, Centrale, SME, UNES, CEdiS.

⁷Italian Law №1643/1962, proposed by Fanfani Cabinet IV and approved on 26th June, 1962.

effects are still evident. Indeed, while some municipalities (among the biggest ones, Milan and Rome) internalised energy distribution and provision by establishing local monopolies, 91% of the Italian municipalities are still served by *Servizio Elettrico Nazionale*, *ENEL*'s regulated branch.⁸

The liberalisation process - Coherently with the objective of reducing barriers to intra-EU services provision in favour of a European single market, the liberalisation process also involved the energy sector (along with the other utility sectors). Specifically, with Directive 96/92/EC, the provision of electricity was enhanced by allowing competition in the market and by defining common harmonised rules across the EU countries. Italy transposed the 1996 EU Directive into the *Bersani Decree*,⁹ which established the unbundling of generation, transmission, distribution and retail sale in the electricity sector. Accordingly, those activities, which were once the prerogative of a monopolistic, vertically-integrated company (i.e., *ENEL*), underwent a deep rearrangement leading to competitive fragmentation. Among the 'unbundled' activities, production, import, export, purchase and sale of electricity were liberalised, while the network activities (transmission, dispatching and distribution) were kept under a monopolistic regime.

To ensure a workable competition and a smooth transition towards a full free energy retail market, the *Bersani Decree* established a hybrid market configuration: a regulated market, where a unique contract exists and prices are set every three months by the Italian Regulatory Authority for Energy, Networks and the Environment (ARERA, hereafter); and a free market, where consumers can switch and select their supplier amongst a multiplicity of providers. Initially, the liberalisation of the electricity retail market encompassed large-scale ad business consumers only, consistently with the provisions of the EU Directive.¹⁰ In 2007, with Italian Decree Law №73/2007,¹¹ the liberalisation of the market became effective for domestic customers and small/medium-sized enterprises too. Since then, residential customers have been given the possibility to freely choose their energy retailer, subscribing a contract in

⁸This percentage is computed by referring to the number of municipalities where the distribution service is run by the ENEL group.

⁹Legislative Decree №79/1999.

¹⁰Liberalisation was undertaken first in 1999 targeting firms with yearly consumption above 1.000.000 kWh and yearly spending above €100.000 and then in 2003 targeting firms with yearly consumption above 100.000 kWh and yearly spending above €13.000.

¹¹Converted into Law №125/2007.

the free market. Following Directive (EU) 2019/944,¹² in January 2021 Italy has undertaken the final step towards full market liberalisation: the phasing out of regulated prices in the business segment was done through an auction mechanism, by assigning to free market providers consumers that had yet to switch — under the so-called *Servizio a Tutele Graduali*, whose price depends on the outcome of the auction itself and is the same across Italy.¹³ A similar mechanism is expected to be implemented for residential consumers in 2023.

In sum, in Italy, the liberalisation process in the electricity market has been designed to be gradual: alongside the free market, the regulated branch keeps (co-)existing. The rationale of a progressive phase-out lies in the necessity to guide consumers through a more conscious and aware transition to the free market, in compliance with the EU Directives and Competition Law №124/2017.¹⁴ Many other countries have adopted a similar policy framework. As of 2019, sixteen EU Member States had some kind of public price regulation in the residential market,¹⁵ such as end-user price regulation (France), transitory tariffs (Portugal), price caps (the United Kingdom) and price discount for vulnerable consumers (Belgium), among others.¹⁶ By exploiting an original dataset (see [Section 4](#) below), in the remaining part of this paper we investigate whether in Italy the inherited electricity market structure — where the regulated service is provided in most of the territory by one large incumbent — may have, to some extent, distorted and frustrated the consumer exit from the regulated contracts towards the free market and whether this effect carried over within the free market itself. Indeed, in such a setting, consumers might lose incentive to search for other trustworthy competitors and end up ‘sticking’ to the incumbent. Results from our empirical analysis aim to instruct how to fight/reduce what — in many countries — is usually referred to as *consumer inertia* which impedes to reach the benefits from the full market liberalisation.

¹²Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU.

¹³See: Attachment to the ARERA Document №491/2020/R/EEL.

¹⁴See: ARERA Document №397/2019/R/EEL.

¹⁵See: Consumer Protection and Empowerment Volume, ACER-CEER Market Monitoring Report (MMR) 2019, September 23, 2020.

¹⁶Price regulation in energy markets is common outside Europe too; for example, in Texas the incumbent price was set by the public authority — the so-called *price-to-beat* — such that entrants could be competitive and earn sufficient margins ([Hortaçsu et al., 2017](#)); in Connecticut, some types of variable prices have been forbidden to avoid unexpected increases in energy bills ([Brown et al., 2020](#)).

3 Literature review and research hypotheses

As highlighted by [Brown et al. \(2020\)](#) on Texas residential electricity market and by [Sung \(2014\)](#) on telecommunication markets in 24 OECD countries, concentration — measured by the Herfindahl-Hirschman Index (HHI, hereafter) — leads to higher and more stable prices. Purchasing at lower prices pushes consumers to switch energy provider. However, in electricity markets where the liberalisation process is not completed, price competition could be limited: in Italy, for example, as of early 2021, the regulated energy bill breakdown showed that only about 48% was appropriated by the provider with only 9% remunerating the sales service, and similar percentages are recorded in the free market ([ARERA, 2020b](#)). Exploiting data from a large consumer survey conducted in Italy in 2014 and adopting a Bayesian mixed logit model, [Fontana et al. \(2019\)](#) showed that market concentration negatively affects household switching choices.

Switching from an incumbent firm to a new entrant is typically associated with procedural and psychological costs ([Burnham et al., 2003](#)): the larger size and market power allow the incumbent to retain more efficiently consumers through lock-in measures that create barriers to entry ([Klemperer, 1987](#)). A growing literature measures switching costs in different industries such as banking ([Sharpe, 1997](#); [Shy, 2002](#)), telecommunication ([Shi et al., 2006](#)), airline ([Carlsson & Löfgren, 2006](#)), and, of course, energy ([Magnani et al., 2020](#)). Note that specific features of market regulation and related information affect switching costs. As for energy markets under the liberalisation process, consumers that still have regulated contracts tend to be less engaged in market activities. According to a recent survey by ARERA, in 2019 those who had never switched were less informed about market dynamics and free market opportunities than those already purchasing from a free market provider ([ARERA, 2019](#)).

All these elements considered, we argue that:

Hypothesis 1 *Market concentration deters consumer switching from regulated to free market energy contracts.*

Focusing on direct determinants/impediments of consumer choice about energy contracts, the same ARERA survey mentioned above highlights that the so-called *satisfaction* is the main reason justifying inertia by consumers in such a setting ([ARERA, 2019](#)). Behavioural

literature shows that high levels of satisfaction can be attributed by the *status quo bias*, that is, a cognitive bias where changes from the current status are perceived as a loss even if there are better alternatives (Kahneman et al., 1991). Ndebele et al. (2019) develop an online choice experiment administered to residential consumers in New Zealand. These authors present their results referring to three groups of consumers (*bargain hunters; potentially mobile but discerning; captive and loyal*): interestingly, a consistent part of both *bargain hunters* and of *captive and loyal* have positive preferences for status quo. In turn, the presence of status quo bias is often associated with lower engagement. Indeed, Chapman and Itaoka (2018) found that consumers that had never or just briefly considered switching electricity providers felt there was not a significant reason to do it.

We expect, therefore, that, when making the choice of exiting the regulated market (which, according to Hypothesis 1, is *per se* negatively affected by market concentration), consumers tend to switch more to a free market contract offered by the same provider, rather than to a contract offered by any other provider operating in the free market, all things being equal. Hence, we formulate that:

Hypothesis 2 *Market concentration negatively affects switching from energy providers belonging to a different holding company than the one owning the incumbent.*

Moving to specifically consider switching in the free market, and following Shin and Managi (2017),¹⁷ we distinguish switching providers within that market (i.e., external switching) from switching contract with the same provider (i.e. internal switching). Referring to the former, both Shin and Managi (2017) and ARERA (2019) show that consumers who had already made the choice to leave the regulated market are typically more active in market dynamics. However, these consumers might still experience lock-in in markets with higher concentration (Schleich et al., 2019). Accordingly, we claim that:

Hypothesis 3 *Market concentration deters consumer switching from within the free energy market (i.e. external switching).*

Moreover, and considering internal switching, through a greater likelihood of locking consumers in, a higher market concentration should lead to more internal switching: incumbent

¹⁷These authors empirically investigate internal and external switching in eight countries in the European Union (EU) using a representative sample of more than 13,000 households.

firms tend to be more active in offering new contracts to their existing consumer bases as a way to avoid business stealing from competitors. Hence, also in line with empirical results gained by [Schleich et al. \(2019\)](#), we expect:

Hypothesis 4 *Market concentration positively affects switching to another energy contract with the same provider (i.e., internal switching).*

4 Data and methodology

To empirically examine if the switching rates depend on the differences in the market structure across Italian regions, we compile a longitudinal original dataset of four years (2015–2018). In this section, we describe the data that are used in the analysis ([Section 4.1](#) and [4.2](#)), then we present our empirical strategy ([Section 4.3](#)). A succinct description of our variables of interest can be found in [Table A1](#) of the Appendix, while [Table 1](#) reports the summary statistics.

4.1 Data sources

We run our empirical investigation on data obtained from several sources. Our main dataset includes information retrieved from ARERA annual retail market monitoring reports ([ARERA, 2017a, 2017b, 2018, 2019](#)) and ARERA internal database (*Registro Centrale Ufficiale*). On this dataset we measure *switching* as the percentage of Points-of-Delivery (PODs) that switched during a given year, i.e. a flow variable.¹⁸ Specifically, we adopt four different measures of switching (our dependent variable): i) *switching from the regulated market* accounts for every POD migrating from the regulated to the free market; ii) *migration to another group* accounts only for those PODs that, in migrating from the regulated to the free market, leave the corporate group and join a free market provider belonging to a different group; iii) *switching within the free market* refers to PODs that migrate from a free market provider to another one; finally, iv) *internal switching* represents the share of consumers that switch contract without switching supplier. Note that variables i) and ii) track consumers entering the free market for the first time, while variables iii) and iv) track consumers who had already entered the free market.

¹⁸PODs are commonly used by regulators, including ARERA, as a proxy for the number of consumers.

As for the free market characteristics and concentration indices, we retrieve from ARERA internal database the total number of active free market retailers, the free market participation rate and regional concentration indices — namely, Herfindhal-Hischer Index¹⁹ (HHI) and Concentration Ratios (CRs).²⁰ Variability over time and across regions in the concentration indices stems from the different business policies and marketing strategies adopted by retailers at the regional level (*supply side*) and from consumer switching (*demand side*).²¹ We also collect data on delinquency at the regional level from ARERA annual market monitoring reports. Other regional sociodemographic data are retrieved from the Italian national institute of statistics (ISTAT). This set of variables includes: unemployment rate, share of population that received higher education (holding at least a high-school diploma), share of households having home access to the Internet, share of population above 65 years old, average disposable income per inhabitant and regional size (in terms of population).

In our analysis, we omit variables related to energy prices. Regulated prices are the same across Italian regions as they are set at the national level. Prices in the free market, instead, show very little variability across Regions.²²

4.2 Summary statistics

Table 1 provides summary statistics on the twenty Italian regions, over the four years of our investigation. Overall, switching rates over the period 2015–2018 were fairly low.²³ On average 4.17% of consumers in each region left the regulated market, whereas only 29.50% of them (1.23% of total consumers) chose a free market retailer belonging to a different group. Those that had already entered the free market did not fare much better: 5.81% of

¹⁹We normalise the HHI between 0 and 1, computing it as follows:

$$HHI = \sum_{i=1}^N s_i^2 \quad (1)$$

where s_i represents the share of firm i and N is the number of active firms.

²⁰We compute 1-firm, 2-firm and 3-firm CRs (CR1, CR2 and CR3 respectively) as the sum of the market shares of the largest active firms.

²¹In particular, during the time span considered, on average 1,311,718 consumers per year migrated from the regulated to the free market, thus reshuffling market shares.

²²Computations based on the figures published by <https://www.facile.it> show that in 2017 energy prices were equal to 0.22€/kWh in each region, except for Valle d’Aosta where the unit price was 0.23€/kWh.

²³As the switching rate data published in the 2018 ARERA retail market monitoring report were disclosed in aggregate form only, we cannot distinguish among the different switching measures for the year in question.

Table 1. Summary statistics.

Variable	Mean	Min	Max	Overall SD	Between SD	Within SD	N
Measures of switching							
<i>Switching from the regulated market</i>	0.0417	0.0130	0.0840	0.0114	0.0067	0.0094	80
<i>Migration to another group</i>	0.0123	0.0060	0.0240	0.0036	0.0033	0.0015	60
<i>Switching within free market</i>	0.0581	0.0140	0.0880	0.0162	0.0155	0.0054	60
<i>Internal switching</i>	0.0260	0.0050	0.0710	0.0135	0.0092	0.0100	60
Concentration indices							
<i>HHI</i>	0.3750	0.1861	0.6387	0.1100	0.1093	0.0245	80
<i>CR3</i>	0.8114	0.5959	0.9378	0.0715	0.0695	0.0215	80
<i>CR2</i>	0.7282	0.5022	0.8776	0.0966	0.0949	0.0257	80
<i>CR1</i>	0.5629	0.3567	0.7928	0.1178	0.1181	0.0216	80
Market characteristics							
<i>Active free market retailers</i>	147.4	52	268	47.3557	33.4939	34.1077	80
<i>Regulated market participation</i>	0.6187	0.4302	0.7649	0.0760	0.0546	0.0540	80
<i>Free market participation</i>	0.3813	0.2351	0.5698	0.0760	0.0546	0.0540	80
Socio-demographic factors							
<i>Regulated market delinquency</i>	0.0328	0.0110	0.0690	0.0139	0.0136	0.0040	80
<i>Free market delinquency</i>	0.0594	0.0130	0.1220	0.0256	0.0257	0.0044	80

consumers migrated from a free market provider to another one and only 2.60% renegotiated their contract (i.e., internally switched). As the statistics of the concentration indices suggest, there is cross-sectional variability, which we hypothesise to be explanatory of the discrepancies in the switching rates. The mean HHI is 0.3755, depicting a highly concentrated market. Over the years studied, only 8 observations — all of which are associated with regions located in Northern Italy²⁴ — present an HHI below the 0.25 threshold, which indicates moderate concentration²⁵ (see Figure B1). Apart from Valle d’Aosta and Toscana — respectively, 1st and 9th ranked — the top 10 for the highest average HHI contains all of the 8 Southern regions. As regards the 2015–2018 average switching rates, Trentino Alto-Adige (Sardegna) has the highest (lowest) rate of switching from the regulated market; Trentino Alto-Adige (Sicilia) has the highest (lowest) rate of migration towards a different ground; Toscana (Trentino Alto-Adige) has the highest (lowest) rate of switching within the free market; and, finally, Valle d’Aosta (Sardegna) has the highest (lowest) rate of internal switching.

²⁴Lombardia, Veneto, Trentino-Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna.

²⁵As a rule of thumb, HHI values over 0.25 are associated with critical competitive dynamics and high concentration. Values between 0.15 and 0.25 depict a moderately concentrated market. Values under 0.15 indicate an unconcentrated market (U.S. Federal Trade Commission, 1997).

4.3 Empirical model

To examine how switching is affected by the market structure, we estimate an OLS specification with observations at the regional level, yearly reported from 2015 to 2018. Specifically, we estimate the following regression:

$$Y_{it} = \alpha_i + \alpha_t + \beta \times Index_{it-1} + \mathbf{X}_{it-1}\boldsymbol{\phi}' + \mathbf{Z}_{it}\boldsymbol{\psi}' + \varepsilon_{it} \quad (2)$$

where i indices regions, t indices years. Y is the switching variable of interest as detailed in Section 4.1 (e.g., *switching from the regulated market* or *switching within the free market*), α_i are regional fixed effects, α_t are time fixed effects, $Index$ is the market concentration index of interest (i.e., HHI, CR3, CR2 or CR1), \mathbf{X} is a row vector of variables identifying market characteristics (i.e., number of active retailers, market-specific participation rate), \mathbf{Z} is a row vector of sociodemographic variables (e.g., access to Internet, unemployment). We lag at $(t - 1)$ the market concentration variables as well as the number of active providers and the market-specific participation rate, since these variables are computed using retailer data recorded on December, 31st of each year.²⁶ Standard errors are robust to cross-sectional heteroskedasticity and serial correlation. The coefficient of interest is β , which measures the effect of market concentration on the switching variable of interest Y .

5 Results

Table 2 presents the results of our empirical analysis on the *switching from the regulated market*. Overall, we find that concentration has a negative effect on the exits from the regulated market. In particular, HHI and CR1 are negative and significant at the 5% level. An increase of 1 percentage point (p.p.) in the market share of the biggest retailer (CR1), reduces the rate of switching from regulated market by 0.095 p.p., which corresponds to a decrease by 1.6% if we consider the mean of 5.9% in 2019 (ARERA, 2021b). This result validates our Hypothesis 1: areas characterised by a higher market concentration exhibit higher consumer inertia.

The *number of active free market retailers* is associated with a negative coefficient too.

²⁶In so doing, we also eliminate potential concerns regarding endogeneity between switching rates and market concentration.

Table 2. Output of the model in Eq. (2), with *switching from the regulated market* as the dependent variable.

	Switching from the regulated market			
	(1)	(2)	(3)	(4)
HHI	-0.094** (0.037)			
CR3		-0.057* (0.030)		
CR2			-0.044 (0.026)	
CR1				-0.095** (0.033)
Active free market retailers	-0.0003** (0.0001)	-0.0003** (0.0001)	-0.0003** (0.0001)	-0.0003** (0.0001)
Regulated market participation	0.097 (0.069)	0.167* (0.093)	0.152 (0.094)	0.113 (0.072)
Regulated market delinquency	-0.133 (0.241)	-0.170 (0.217)	-0.177 (0.228)	-0.058 (0.291)
Other socio-demographic variables	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	60	60	60	60
R-squared	0.875	0.866	0.864	0.872

Note: full output reported in Table C1 of the Appendix.

Previous studies found that a higher number of alternatives, by complicating the comparison, is associated with less consumer switching (Annala et al., 2013; Fontana et al., 2019) and reduced consumer ability to appropriate gains from switching (Wilson & Price, 2010). We add to those results that the increase in the switching cost is especially evident for consumers leaving the regulated market. They are less likely to be familiar with retailers in the free market so, when choosing among multiple retailers, a higher number of alternatives increases their switching cost in terms of complexity and time required to rank the options, finally resulting in a decrease of the switching rate.

Further, a higher number of retailers increases the likelihood of unfair marketing practices damaging consumer trust in the free market (ARERA, 2019). Among the other variables (Table C1 in the Appendix) it is worth noting that *home access to the Internet* positively affects this measure of consumer engagement; the access to the Internet, which might proxy the frequency of its use, is often presented as a factor decreasing switching costs and stimulating market engagement (Shin & Managi, 2017; Flores & Price, 2018; Fontana et al., 2019).

Table 3. Estimates of the model in Eq. (2), with *migration to another group* as the dependent variable.

	Migration to another group			
	(1)	(2)	(3)	(4)
HHI	-0.034 (0.024)			
CR3		-0.040*** (0.010)		
CR2			-0.033*** (0.007)	
CR1				-0.001 (0.035)
Active free market retailers	0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.0001 (0.0001)
Regulated market participation	-0.021 (0.055)	-0.021 (0.044)	-0.036 (0.044)	0.011 (0.061)
Regulated market delinquency	0.155 (0.108)	0.089 (0.088)	0.081 (0.087)	0.167 (0.117)
Other socio-demographic variables	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.755	0.821	0.832	0.715

Note: full output reported in Table C2 of the Appendix.

In Table 3, we examine how market concentration impacts a subset of exits from the regulated market, namely those entailing a change of corporate group too. CR3 (CR2) is found to be negative and significant at the 1% level, meaning that an increase by one percentage point in the market shares of the biggest three (two) retailers in the region, reduces by 0.040 p.p. (0.033 p.p.) the rate of *migration to another group*, corresponding to a decrease by 3.25% (2.68%) if we consider the mean value of 1.23% in Table 1. Therefore, market concentration deters consumers in the regulated market from subscribing a contract in the free market with a retailer belonging to a different corporate group.

As for the switching dynamics involving consumers who had already joined the free market, we examine *switching within the free market* and *internal switching*. Table 4 contains the output of our model with *switching within the free market* as the dependent variable. Differently from what happens for the switching from the regulated market, the number of competitors has a positive effect on switching.

Table 4. Estimates of the OLS specification in Eq. (2), with *switching within the free market* as the dependent variable.

	Switching within the free market			
	(1)	(2)	(3)	(4)
HHI	0.073 (0.048)			
CR3		0.066* (0.037)		
CR2			0.051* (0.029)	
CR1				0.026 (0.076)
Active free market retailers	0.0003** (0.0002)	0.0004*** (0.0002)	0.0004** (0.0002)	0.0003 (0.0002)
Free market participation	-0.141 (0.154)	-0.140 (0.168)	-0.160 (0.178)	-0.068 (0.140)
Free market delinquency	0.590** (0.223)	0.551*** (0.188)	0.539** (0.190)	0.591** (0.233)
Other socio-demographic variables	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.908	0.914	0.914	0.900

Note: full output reported in Table C3 of the Appendix.

This result is consistent with the findings of [Schleich et al. \(2019\)](#).²⁷ We argue that in this case, as regards consumers in the free market, the number of different retailers does not entail additional effort (and switching cost) because they are already familiar with the market dynamics and, rather, they are stimulated by the presence of multiple alternatives. However, unlike what we expected from [Hypothesis 3](#), market concentration positively affects consumer switching within the free market. The coefficients of two indices over four, CR3 and CR2, are positive and significant at the 10% level. This could suggest that, since in more concentrated regions households tend to switch more towards a provider belonging to the same holding company of the incumbent (perhaps due to the fact that it is easier for such companies to migrate consumers from regulated over free market contracts), consumers might initially feel dissatisfied by the choice and, consequently, switch a second time with a higher frequency.²⁸

²⁷[Schleich et al. \(2019\)](#) used the number of suppliers per 100,000 households.

²⁸To strengthen the interpretation of our results, we also checked whether switching within the free market is correlated with migration to another group and satisfaction (measured as a percentage of people that feel

Further, we find that *free market delinquency* increases the rate of switching. Such a result is in line with the authority's claims about the existence of delinquent consumer opportunistic behaviour consisting in the practice of switching supplier in order to attempt to avoid paying unpaid bills (ARERA, 2009, 2020a).

Table 5 reports the results of the analysis on the *internal switching*. The hypothesis about the increased commercial aggressiveness towards free market customers by bigger companies (Hypothesis 4) seems to be confirmed. The rate of internal switching is positively affected by market concentration. The marginal effect of a 1 p.p. expansion in CR3 market share increases internal switching by 0.11 p.p., which corresponds to an increase by 4.23% (given the mean of 2.60% in Table 1). *Free market delinquency*, *unemployment rate* and the percentage of *over 65* living in the region are also found to be associated with positive coefficients.

Table 5. Estimates of the OLS specification in Eq. (2), with *internal switching* as the dependent variable.

	Internal switching			
	(1)	(2)	(3)	(4)
HHI	0.157*** (0.043)			
CR3		0.110*** (0.024)		
CR2			0.088*** (0.018)	
CR1				0.139* (0.076)
Active free market retailers	-0.0001 (0.0001)	0.0001 (0.0001)	-0.0001 (0.0001)	-0.0004* (0.0002)
Free market participation	0.161** (0.072)	0.198*** (0.068)	0.159** (0.073)	0.324** (0.129)
Free market delinquency	0.702*** (0.168)	0.636*** (0.134)	0.614*** (0.128)	0.708*** (0.186)
Other socio-demographic variables	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.914	0.914	0.918	0.864

Note: full output reported in Table C5 of the Appendix.

satisfied by the electricity service as a whole, according to ISTAT surveys). Results, shown in Table C4, highlight that switching within the free market is lower in areas where there have been higher rates of exit from the regulated market towards another group (*migration to another group*).

6 Discussion and policy implications

In many countries, the liberalisation process of energy markets is still encountering resistance from consumers because of, among others, scepticism towards new providers and complexity of energy offers. While achieving higher switching rates — both from regulated offers to free market ones and within free market — cannot be considered the sole objective of a policymaker, it is definitely a relevant one in reaching market efficiency and facilitating transition towards cleaner energy sources, as recently reminded by the European Union when updating its energy policy framework.²⁹

Reducing consumer inertia seems particularly urgent in the Italian electricity market, as well as in other countries,³⁰ especially considering the migration from regulated to free market contracts. Low switching rates, high market concentration and impending phasing out of regulated prices require policymakers to improve awareness among consumers and enhance competition dynamics,³¹ at the same time ensuring a cooling-off period during which consumers under a regulated contract can transition to a free market environment without experiencing large economic and cognitive/psychological shocks (Stagnaro et al., 2020).

The first set of results provides policymakers suggestions in designing mechanisms and tools to increase consumer engagement and improve the transition from regulated to free market contracts. To begin with, we believe that the adverse effect of concentration on switching rates must be taken into account when identifying locations in preparation of the auction that, in 2023, will allocate to free market providers residential consumers who will have yet to switch. As mentioned in Section 2, small and medium enterprises and micro-businesses with a committed power capacity above 15 kW without a free market contract as of January 2021 have been assigned to energy providers bidding in a two-stage sequential multi-unit auction mechanism implemented during the first semester of 2021.³² Providers could bid for each of the nine areas identified by ARERA and win up to a number of areas such that consumption would be lower than 50% of total consumption; around 200,000 consumers were allocated

²⁹See, for example, the Directive (EU) 2019/944.

³⁰See, among others, Ghazvini, M. A. F. et al.(2019); Giulietti et al. (2014), Harold, J. et al. (2020) Hortacsu et al. (2017); Ndebele (2019); Shin et al. (2017)

³¹See, for example, *Memoria presso la X Commissione Attività produttive, commercio e turismo della Camera dei Deputati*, ARERA, 18 May 2021.

³²ARERA Resolution №491/2020/R/EEL.

through such auction to four free market providers. Bidding areas were built such that they were homogeneous along two dimensions: size (in terms of both number of consumers and consumption) and delinquency rate — this configuration was preferred to an alternative one where geographical contiguity was used instead of size.³³ We strongly suggest, henceforth, that, in designing the new auction — which will allocate up to 12 million residential consumers — policymakers will add a further dimension in identifying locations, that is, existing market concentration in the free market; for example, areas can be designed such that concentration ratios are similar to each other, avoiding to aggregate areas where market shares are largely skewed towards few firms. Further, as a way to stimulate competition in the free market, the regulator could identify smaller geographical areas (e.g., aggregating provinces, rather than regions) and set up stricter rules on how many areas each bidder can win.

Further, we propose to take into consideration firm numerosness as well when designing policy tools. Our results point out that a large number of active firms increase consumer inertia and deters switching to the free market — perhaps because of more spread aggressive marketing practices which, inevitably, increase scepticism and delay the choice. In order to improve the quantity of active firms and restore consumer trust, we propose to establish criteria through which energy providers are allowed to operate in the market; such criteria, that must be implemented before full liberalisation occurs, should certify the financial solidity of the company as well as the absence of sizable penalties received by regulatory agencies. The creation of a list of criteria to license electricity providers (the so-called *Elenco venditori*) is a much requested policy tool that was first approved by the Parliament in 2016³⁴ but has yet to be implemented.

The second set of results sheds some light on the dynamics within the free market. The positive association between market concentration and switching rates might appear controversial at first; however, it can be explained in light of the first set of results. As illustrated in Section 5, in a more concentrated region, when deciding to enter the free market, residential consumers tend to choose with a higher probability the energy provider belonging to the same holding company of the incumbent. This might be due to the fact that, in such

³³The areas up for bid were generally including a set of Italian regions. More specifically, ARERA identified the following areas: Puglia and Toscana; Lazio; Lombardia without the Milan municipality; Piemonte and Emilia-Romagna; Milan, Friuli-Venezia Giulia and Valle d'Aosta; Veneto, Liguria and Trentino-Alto Adige; Campania and Marche; Umbria, Abruzzo, Molise, Basilicata and Calabria; Sicilia and Sardegna.

³⁴Italian Law №124/2017.

regions, the incumbent is more capable of migrating its own consumer base from regulated to free-market offers.³⁵ This way, consumers might feel pressured in selecting a new contract with the same provider even though it is not, potentially, the best one for their needs. Once in the free market, consequently, consumers might be more prone to make a new choice — as they had already experienced the switching process and feel therefore more engaged with market dynamics.

In order to reduce the risk of making sub-optimal choices in switching energy contract — especially from the regulated market — we propose to improve the informational set available to consumers during the decision-making process.³⁶ This can be achieved by establishing requirements that can be easily implemented through existing tools, such as energy bills. Nowadays, indeed, bills, on top of notifying payment schedules to consumers, also aim at informing them about their consumption habits and their rights. This document can be enhanced in order to provide additional information which might help consumers to make a sounder and more rational choice in choosing a new provider. Specifically, we suggest improvements along two lines of action. The first one would mandate providers — both in the regulated and in the free market — to send to consumers, on a yearly basis, a letter summarising all information related to their energy supply in the past 12 months, such as consumption and spending. Hence, consumers would be able to rely on such information when comparing offers, for example using the public price comparison website which shows results in terms of estimated yearly spending. The second one would require incumbents to recommend residential consumers — a few months before regulated prices will be phased out — tips and steps to switch energy providers, such as acquiring information about yearly energy consumption and spending, checking contractual conditions and evaluating personal preferences over the price type (e.g., fixed/variable, time-based prices).

³⁵The tendency of energy incumbents to aggressively market free-market offers to regulated consumers has been assessed by the Italian Competition Authority. In 2019, the authority imposed fines totalling €109.000.000 on two large incumbents in the energy market for abusive and exclusionary conducts against competitors; the investigation showed that there was an exchange of information about consumers between the regulated and the free-market branches of the firm which were used by the latter to market free-market offers.

³⁶This is in line with [Waterson \(2003\)](#), who highlighted in his policy prescriptions that “*authorities also need to embrace the idea that consumers may need substantial assistance in challenging established players*” ([Waterson, 2003](#), p. 146).

7 Conclusions

In this paper we empirically study how firm incumbency affects consumer choice in switching provider and/or contract in the Italian residential electricity market. We measure firm incumbency at regional level and with different indicators of market concentration. As for consumer inertia, our novel dataset allows us to proxy it with detailed measures of switching in the Italian electricity market. Specifically, we record i) switching rates from the regulated to the free market; ii) switching from the regulated to the free market by joining a market provider belonging to a different holding company with respect to the incumbent; iii) switching rates within the free market and iv) switching rates to another energy contract with the same provider (i.e., internal switching). These accurate measures of switching produce original results which add both to the literature on retail choice in utilities and to the one on switching costs.

Our main results show that regions recording stronger firm incumbency exhibit larger consumer inertia in leaving the regulated market. This effect is reinforced by the number of active free market retailers: it is possible that a higher number of alternatives increases consumer cost in terms of complexity and time required to rank the options, thus resulting in a decrease of the switching rate; further, more firms might increase the likelihood of unfair marketing practices with negative effects on trust towards the free market. Internet connection at home positively affects consumer switching. Differently from what happens for consumers in the regulated markets, switching rates within the free market (i.e., *switching within the free market* and *internal switching*) are positively affected by market concentration; we suggest that, as firm incumbency propels switching towards firms belonging to the same company of the incumbent (a sub-optimal choice if made under pressure or without enough information), once in the free market, consumers might feel more dissatisfied and prone to switch a second time shortly after. The number of providers also has a positive effect on switching rates within the free market: as consumers are already used to the switching process, a wider array of alternatives has a positive effect on consumer engagement.

These results contribute to the design of policies to enhance the consumer benefits of retail choice in the energy markets where the process is still ongoing. As for Italy, we equip policymakers with precise suggestions to improve — separately — consumer transition from regulated to free market and retail choices in the free market.

More in general, we think that our findings can be of great help to policymakers when it comes to designing the liberalisation process in other markets as well, as the simultaneous presence of regulated and free market prices is a feature characterising many States in Europe and North America alike.

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Appendix A

Table A1. Variable definitions.

Variable	Definition
Measures of switching	
<i>Switching from the regulated market</i>	Share of PODs that migrated from the regulated to the free market.
<i>Migration to another group</i>	Share of PODs that migrated from a regulated market retailer to a free market retailer belonging to a different corporate group.
<i>Switching within the free market</i>	Share of PODs that migrated from a free market retailer to another free market retailer.
<i>Internal switching</i>	Share of PODs that renegotiated the contract with the same supplier.
Concentration indices	
<i>HHI</i>	Herfindahl–Hirschman index in the free market (i.e., sum of squared shares of each retailer in terms of customer accounts).
<i>CR_i where $i = \{1, 2, 3\}$</i>	Share of customer accounts held by the (1, 2 or 3) biggest retailers.
Market characteristics	
<i>Active free market retailers</i>	Number of free market retailers supplying at least one customer.
<i>Regulated market participation</i>	Share of PODs in the regulated market out of total active PODs.
<i>Free market participation</i>	Share of PODs in the free market out of total active PODs.
Socio-demographic factors	
<i>Regulated market delinquency</i>	Share of delinquent PODs in the regulated market (i.e., PODs for which the suspension of the electricity service has been requested by the retailer following non-payment of invoices).
<i>Free market delinquency</i>	Share of delinquent PODs in the free market (i.e., PODs for which the suspension of the electricity service has been requested by the retailer following non-payment of invoices).

Appendix B

Figure B1. 2015–2018 Italian electricity market HHI.

Source: Authors' elaboration using Stata command 'spmap' .

Figure B2. Switching rates over the years 2015–2018.

(a) Switching from the regulated market

(b) Migration to another group

(c) Switching within the free market

(d) Internal switching

Source: Authors' elaboration using Stata command 'spmap' .

Appendix C

Table C1. Estimates of the OLS specification in [Eq. \(2\)](#), with *switching from the regulated market* as the dependent variable.

	Switching from the regulated market			
	(1)	(2)	(3)	(4)
HHI	-0.094** (0.037)			
CR3		-0.057* (0.030)		
CR2			-0.044 (0.026)	
CR1				-0.095** (0.033)
Active free market retailers	-0.0003** (0.0001)	-0.0003** (0.0001)	-0.0003** (0.0001)	-0.0003** (0.0001)
Regulated market participation	0.097 (0.069)	0.167* (0.093)	0.152 (0.094)	0.113 (0.072)
Regulated market delinquency	-0.133 (0.241)	-0.170 (0.217)	-0.177 (0.228)	-0.058 (0.291)
Unemployment rate	-0.213 (0.130)	-0.187 (0.125)	-0.191 (0.124)	-0.210 (0.127)
Education	-0.049 (0.099)	0.045 (0.090)	0.041 (0.091)	-0.028 (0.092)
Home access to the Internet	0.094** (0.038)	0.069 (0.041)	0.066 (0.042)	0.074* (0.038)
Over-65 rate	0.640 (0.757)	0.228 (0.828)	0.394 (0.852)	0.353 (0.728)
Income per inhabitant	-0.008 (0.007)	-0.002 (0.008)	-0.001 (0.008)	-0.008 (0.007)
Population	-0.007 (0.012)	-0.003 (0.012)	-0.003 (0.012)	-0.007 (0.011)
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	60	60	60	60
R-squared	0.875	0.866	0.864	0.872

Note: Body-text output reported in [Table 2](#).

Table C2. Estimates of the OLS specification in [Eq. \(2\)](#), with *migration to another group* as the dependent variable.

	Migration to another group			
	(1)	(2)	(3)	(4)
HHI	-0.034 (0.024)			
CR3		-0.040*** (0.010)		
CR2			-0.033*** (0.007)	
CR1				-0.001 (0.035)
Active free market retailers	0.0001 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)	0.0001 (0.0001)
Regulated market participation	-0.021 (0.055)	-0.021 (0.044)	-0.036 (0.044)	0.011 (0.061)
Regulated market delinquency	0.155 (0.108)	0.089 (0.088)	0.081 (0.087)	0.167 (0.117)
Unemployment rate	0.004 (0.061)	-0.003 (0.057)	-0.004 (0.054)	0.032 (0.061)
Education	-0.020 (0.155)	-0.066 (0.130)	-0.045 (0.122)	0.090 (0.152)
Home access to the Internet	-0.001 (0.024)	0.017 (0.021)	0.014 (0.020)	-0.025 (0.026)
Over-65 rate	-0.145 (0.534)	-0.260 (0.532)	-0.092 (0.518)	-0.276 (0.632)
Income per inhabitant	0.002 (0.004)	0.002 (0.003)	0.002 (0.003)	0.005 (0.005)
Population	-0.006 (0.005)	-0.002 (0.005)	-0.002 (0.005)	-0.009 (0.007)
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.755	0.821	0.832	0.715

Note: Body-text output reported in [Table 3](#).

Table C3. Estimates of the OLS specification in [Eq. \(2\)](#), with *switching within the free market* as the dependent variable.

	Switching within the free market			
	(1)	(2)	(3)	(4)
HHI	0.073 (0.048)			
CR3		0.066* (0.037)		
CR2			0.051* (0.029)	
CR1				0.026 (0.076)
Active free market retailers	0.0003** (0.0002)	0.0004*** (0.0002)	0.0004** (0.0002)	0.0003 (0.0002)
Free market participation	-0.141 (0.154)	-0.140 (0.168)	-0.160 (0.178)	-0.068 (0.140)
Free market delinquency	0.590** (0.223)	0.551*** (0.188)	0.539** (0.190)	0.591** (0.233)
Unemployment rate	0.086 (0.183)	0.072 (0.156)	0.067 (0.156)	0.034 (0.179)
Education	1.290*** (0.318)	1.290*** (0.290)	1.237*** (0.279)	1.106*** (0.326)
Home access to the Internet	-0.017 (0.044)	-0.026 (0.039)	-0.018 (0.037)	0.025 (0.052)
Over-65 rate	3.841* (1.990)	4.043** (1.839)	3.771* (1.879)	4.170** (1.969)
Income per inhabitant	0.016 (0.011)	0.013 (0.010)	0.012 (0.010)	0.011 (0.011)
Population	-0.008 (0.017)	-0.014 (0.016)	-0.013 (0.016)	-0.002 (0.021)
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.908	0.914	0.914	0.900

Note: Body-text output reported in [Table 4](#).

Table C4. Estimates of the OLS specification in Eq. (2), with *switching within the free market* as the dependent variable and the lags of *migration to another group* and *satisfaction* as explanatory variables.

	Switching within the free market			
	(1)	(2)	(3)	(4)
HHI	0.127** (0.057)			
CR3		0.164*** (0.037)		
CR2			0.130*** (0.030)	
CR1				0.041 (0.080)
Migration to another group	-0.796 (1.050)	-2.199** (1.019)	-2.214** (1.034)	-0.022 (1.057)
Satisfaction	-0.071 (0.062)	-0.071 (0.054)	-0.069 (0.056)	-0.034 (0.073)
Active free market retailers	0.0004* (0.0002)	0.001** (0.0002)	0.0004* (0.0002)	0.0003 (0.0002)
Free market participation	-0.024 (0.257)	0.188 (0.247)	0.137 (0.243)	-0.053 (0.271)
Free market delinquency	0.729** (0.265)	0.574** (0.205)	0.537** (0.203)	0.675** (0.308)
Unemployment rate	0.220 (0.211)	0.287* (0.158)	0.275* (0.159)	0.068 (0.206)
Education	1.512*** (0.265)	1.718*** (0.271)	1.593*** (0.268)	1.153*** (0.327)
Home access to the Internet	-0.025 (0.053)	-0.028 (0.049)	-0.008 (0.052)	0.020 (0.056)
Over-65 rate	4.939** (2.285)	6.680*** (2.259)	5.993** (2.211)	4.459* (2.451)
Income per inhabitant	0.026** (0.012)	0.026** (0.011)	0.024** (0.011)	0.014 (0.013)
Population	-0.012 (0.015)	-0.028 (0.017)	-0.025 (0.018)	-0.003 (0.020)
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.917	0.939	0.939	0.901

Table C5. Estimates of the OLS specification in [Eq. \(2\)](#), with *internal switching* as the dependent variable.

	Internal switching			
	(1)	(2)	(3)	(4)
HHI	0.157*** (0.043)			
CR3		0.110*** (0.024)		
CR2			0.088*** (0.018)	
CR1				0.139* (0.076)
Active free market retailers	-0.0001 (0.0001)	0.0001 (0.0001)	-0.0001 (0.0001)	-0.0004* (0.0002)
Free market participation	0.161** (0.072)	0.198*** (0.068)	0.159** (0.073)	0.324** (0.129)
Free market delinquency	0.702*** (0.168)	0.636*** (0.134)	0.614*** (0.128)	0.708*** (0.186)
Unemployment rate	0.321*** (0.094)	0.270*** (0.094)	0.265*** (0.090)	0.233** (0.108)
Education	-0.039 (0.245)	-0.154 (0.229)	-0.231 (0.214)	-0.267 (0.248)
Home access to the Internet	-0.058 (0.045)	-0.049 (0.043)	-0.038 (0.039)	0.006 (0.054)
Over-65 rate	3.953*** (0.954)	4.422*** (1.041)	3.950*** (1.065)	4.829*** (1.172)
Income per inhabitant	0.032*** (0.008)	0.023*** (0.008)	0.022*** (0.007)	0.028*** (0.009)
Population	0.015 (0.016)	0.010 (0.016)	0.011 (0.015)	0.024 (0.019)
Regional FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	40	40	40	40
R-squared	0.914	0.914	0.918	0.864

Note: Body-text output reported in [Table 5](#).