ORGANIZATIONAL BEHAVIOUR AND FIRM PERFORMANCE: A STUDY OF ITALIAN RETAIL INDUSTRY

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Abstract

There is a growing consensus among scholars that the liberalization of shop opening hours increases revenues and creates jobs. While this is probably true, prior literature does not provide evidence on the risks of this kind of liberalization on the reduction of firm performance, and how firms in the retail industry manage the risk of underperformance. In fact, although theory establishes a direct link between increasing of shop opening hours with revenues and employment, it is challenging to rule out how firms react to this and if there are effects on firm performance. While several studies on firms' strategic choices on opening hours have recently been released, no empirical studies provide evidence on firm performance following a change in the regulation of shop opening hours. The study contributes to the literature adding evidence on consequences on firm performance, an aspect generally not analysed by prior scholars in this field. We explore the effects of extended shopping hours on performance faced by firms operating in retail industries. To this purpose, we collected data about a large sample of limited liability companies in Italy, where a reform was issued in 2012 to boost the economy even through liberalization of shop opening hours. Using data of Italian firms operating in the retail industries, we find that reducing restrictions on shopping hours increases revenues and personnel costs. Interestingly, our model predicts that the deregulation of shopping hours involves firm lower performance.

Keywords: Retail Industry, Deregulation, Performance, Firm Behaviour, Employment

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1. INTRODUCTION

The debate concerning liberalization in terms of a number of opening hours is still a controversial topic for scholars and practitioners. The theme is relevant since it implicates social, political, and economic interests (Rizzica, Roma, & Rovigatti, 2020). Notwithstanding the tendency concerning the liberalization of shop opening hours in both the American and the European contexts appears well defined, the type and level of the opening hours regulation still differ across countries, regions, and provinces. The justification for the opening hours

liberalization is that it implies more flexible purchasing activities for clients, better choice, higher competition, and growth of economic activity (Huddleston & Huddleston, 2010). The primary targets of liberalizing shop opening time can be divided into 4 types (Tanguay, Vallge, & Lanoie, 1995): 1) providing chances to buy needed goods and services; 2) safeguarding a good life quality; 3) defending small firms; 4) guaranteeing a day of rest for the employees. However, not all the primary targets can be always reached all together. Moreover, despite the primary interest of employees is having an assurance of available free time, most of

the limitations on the liberalization of shop opening hours have been revoked or declared unconstitutional in many countries (Goos, 2004). Furthermore, the shopping hours liberalization has economic effects that go beyond the matter of ensuring employees the right to a day of rest (Rizzica et al., 2020). One reason against the liberalization is that competition may bring to the unreasonable extension of shopping hours even if this kind of reform is based on the idea that competition should not influence firms to maintain stores open even when is not economically supportable (Clemenz, 1994). Firms have to manage the risk of losing clients if they do not leave the shops open, and at the same time have to manage the risk of maintaining the same profitability even with higher costs (e.g., employees costs).

This kind of liberalization provides a unique setting in which to examine the effects of increasing the flexibility of firms' business activities in the market in a context with substantive reforms. In fact, since the liberalization permits firms active in retail industries to modify the shop opening hours, competition between firms of the same industries changes (Paul, 2015). Moreover, the liberalization may have an influence on labour market evaluations of different kinds of employees. In fact, while liberalization normally aims at lowering unemployment and increasing chances to buy needed goods and services (Blanchard & Giavazzi, 2003), the particular labour configuration in the retail industry has raised several consultations on whether this kind of liberalization encourages part-time employment at the expense of full-time employment (Paul, 2015).

Liberalization has an important effect on firm behaviour since it provides firms with new opportunities in setting business hours strategically (Kügler & Weiss, 2016). The primary concern of firms is about the cost-benefit analyses in relation to the changes induced by this kind of reform. While most of the previous studies analysed the perceived impact on employment, and how liberalization of shop opening time affect retail labour and product markets (Shy & Stenbacka, 2008; Wenzel, 2011), there are no empirical studies with the aim to understand firm performance in consequence to this kind of reform (Kügler & Weiss, 2016). Understanding the changes in firm performance in response to liberalization is fundamental to comprehend the effects of those kinds of reforms. In fact, in this context firm performance can be affected by several possible mechanisms: 1) an increase of revenues, 2) an increase of personnel costs due to a higher demand for personnel to cover the additional hours (Nooteboom, 1983); 3) changing resource allocation for personnel costs in relation to the choice to use part-time employees or full-time employees.

The empirical analysis of our paper investigates firm performance in a single market (Italy) after the liberalization of shop opening hours. This paper examines the liberalization on shop opening hours that occurred in Italy from January 2012. The Italian Law Decree n. 201 of 2011 entirely liberalized days and shop opening hours all over the country.

Using retail firm financial data from 2009 to 2018, this study provides some evidence that personnel costs and revenues significantly increased for the firms affected by the liberalization of the year 2012. Moreover, we find that the

liberalization brought to a reduction of performance for firms affected by the liberalization. These estimations are strongly robust using different specifications.

Our study contributes to the literature on organizational behaviour in the retail industry, and the effect on performance. First, we answer the recent call advanced by prior scholars (Kügler & Weiss, 2016) to provide predictions about the consequences of liberalization and to further explore the effects on firm performance. In particular, our analysis of the consequences of shop hours liberalization shows that external regulatory changes may affect firms' resource allocation and can bring to an unexpected performance reduction.

The rest of the work is structured as follows. Section 2 is an initial literature review on the shop hours regulations, where will be considered all the most relevant studies on the topic. After that, in Section 3, we will build the hypotheses to be tested with our econometric model and will follow the application of the model in Section 4 to show the results in Section 5. Section 6 will provide conclusion and discussion able to open new streams of research.

2. THEORETICAL BACKGROUND

Previous research has focused on exploring, from different perspectives, the consequences of liberalizing shop hours regulations (Bernardo, 2018; Dordoni, 2017; Mortimer & Ingersoll, 2015). However, sometimes the literature has generated contrasting findings. Prior literature concentrated on the correlation between opening hours liberalization and prices, finding that the retail firms with the longer opening hours are inclined to charge higher prices to the clients, in order to pay the additional operating costs, and they also achieve a higher market share (Shy & Stenbacka, 2008). Another study explains that the shop opening hours liberalization leads to lower prices in the retail industry (Kay & Morris, 1987). Clemenz (1990) indicates that shop opening hours liberalization brings to a reduction of retail prices because an increase of shopping hours incentive a broader search activity, which, in turn, brings retail prices reduction. Regarding the strategic aspects that bring firms to increase shop opening hours, prior studies examined the motivation of firms to use shop opening hours as a mechanism to complete product diversification in order to improve their market share (Inderst & Irmen, 2005).

The increase of shop opening hours is considered as a strategic variable in the competition since an increase of shopping opening hours tends to reduce transportation costs for the clients, and therefore there is a benefit in the client's utility function (de Meza, 1984; Ferris, 1990). Moreover, increasing shop opening hours can be understood as a good quality characteristic of firms active in the retail industry because it positively affects clients' motivation to buy firm products (Kügler & Weiss, 2013). In fact, shop longer opening hours positively influence clients' inclination to purchase products sold at those shops (Ferris, 1990), since longer opening hours permit clients to have more time to choose and therefore increase the "entertainment" value of spending.

Since is confirmed that an increase of shop opening hours can be considered as a good quality characteristic of the firm, becomes relevant to understand the effects and the firm convenience of taking decisions in relation to an increase of shop opening hours (e.g., increase the quality of the service provided to the clients). Prior scholars concentrated on the "differentiation effect" of quality changes, where firms improve the quality of their products (opening hours) to reduce price competition (Shaked & Sutton, 1982). Therefore, in order to react to an increase of competitor's quality, the other firms have to increase the quality of their own product. As the high-quality firms increase quality and therefore enlarge the gap between qualities, the low-quality firms have additional motivations to improve quality. When the low-quality firms increase quality and therefore become a kind of alternative to the high-quality firms, the stimulus of the high-quality firms to distinguish from the low-quality firms becomes greater. This mechanism implies that quality levels (opening hours) are strategic choices. Therefore, a rise in shop opening hours of one firm is expected to proportionally push client demand for this firm, since clients choose to buy where the quality level is higher (higher opening hours) (Economides, 1989). At the same time, client demand for the competitor's product drops. Therefore, rising shop opening hours has a "demand steeling" influence on competitors, and consequently is a key factor in explaining firm performance (Pennerstorfer & Weiss, 2013). The implications of increasing quality in terms of shop opening hours are part of the relevant strategic decisions that firms have to take in order to obtain good performance.

A relevant characteristic of the firm behaviour in this context is that they define their strategy considering the competitors' conduct. By extending shop opening hours the firms attract clients from the competitor firms that decide not to extend shop opening hours. By extending shop opening hours, firms must hire new employees and pay higher personnel costs. Therefore, firms elaborate cost-benefit analyses regarding the extension of the opening hours, in order to estimate expected higher revenues, and expected higher labour costs. The cost-benefit analyses will differ across retail firms in relation to the characteristic of their organization (independent retailer or retail chain). Prior scholars investigated competition between independent retailers and retail chains (Wenzel, 2011), which is influenced significantly by firm efficiency. In fact, when firm efficiency is high, due to strong buyer power, a more well-organized structure, and economies of scale, firms will be more prone to choose longer shopping hours, otherwise, they are not (Clemenz, 1990).

In terms of firm profitability, Wenzel (2011) explains, with a stylized model with only two firms in the retail market, following the example of the prisoners' dilemma, that if liberalization leads the two retail firms to increase the number of opening hours, both firms decrease profits. In case one firm decides to increase the number of opening hours, while the other not, the first firm will increase profits while the latter will lose. The reason is that if all the firms increase the number of opening hours, prices and market shares are not influenced and remain unaltered, while the operating costs increase.

Therefore, when firms are affected in the same way by the liberalization, and they react with the same approach since they do not want to leave margins to the competitors, they lose profits.

3. HYPOTHESES DEVELOPMENT

Strategic behaviour includes the allocation of already owned resources and the growth of new ones to reach firm targets (Chandler, 1990).

The resources able to influence firm growth can be categorized as organizational, technological, human, and financial (Grant, 1991). Resource-based view scholars have focused on specific and distinctive resources from which firms may develop a sustainable competitive advantage (Mauri & Michaels, 1998). According to this stream of research, the firms are able to obtain a competitive advantage in the market only if they acquire valuable and rare resources (Peteraf, 1993). Those specific resources can be labelled as core resources since the firm strategy is based on those resources owned by the firm. Consequently, those resources influence firm performance. In the specific, resource-based view scholars explain that some of the most important determinants of firm performance are firm-level drivers as marketing and organizational differentiation, which are considered core resources (Dierickx & Cool, 1989). Therefore, firm-level drivers are able to influence firm performance. However, there are also environmental factors, unlinked to firm-level characteristics, able to influence firm resource allocation and so firm performance. The importance of the environment – and particularly of its changes – on resource allocation has been supported by numerous studies (Cheng & Kesner, 1997; Harris, Kriebel, & Raviv, 1982; Meyer, 1982). For example, Meyer (1982) highlights that relevant negative environmental changes (e.g., crises, disasters, threats) influence organizational behaviour, as they stimulate firm responses. Consequently, several types of environmental changes – such as government laws, liberalization, regulation, business policies, and country economic growth – may affect firms' resources allocation, and therefore firm performance.

3.1. Liberalization effect on firm revenues

Firms respond to external environmental changes when they notice the variation and interpret it either as a threat or as an opportunity (Nadkarni & Barr, 2008). In other words, firms try first to understand what the event signifies, and then they develop a specific response (Nadkarni & Barr, 2008). In short, changes in the external environment generate stimuli that guide firms to change their behaviour.

Economic liberalization is considered a change in the external environment that is widely occurring in most countries. It happens that firms with different characteristics (size, technology, industry, etc.) must react in a heterogeneous way to the competitive pressure induced by the elimination of specific limits during the liberalization process (Aghion, Burgess, Redding, & Zilibotti, 2005). Therefore, the effect of liberalization can be unbalanced, even if the firms have to react considering the behaviour of firm competitors.

In fact, with an external environmental change like shop opening hours liberalization, retail firms have to define their strategy in relation to

the competitor behaviour. An increase of shop opening hours of one firm is expected to proportionally push client demand for this firm since clients choose to buy where the quality level is higher (higher opening hours) (Economides, 1989). Therefore, firms that do not follow the increase of opening hours induced by the liberalization lose clients. Consequently, rising shop opening hours has a "demand steeling" influence on competitors, and consequently is a key factor in explaining firm behaviour in relation to the competitor strategy. Therefore, we expect that the implication of shop opening hour's liberalization is that firms behave evenly and increase the shop opening hours as the competitors. As explained by prior studies, an increase of shop opening hours positively affects clients' motivation to buy firm products (Kügler & Weiss, 2013), and, in fact, it brings active customers to spend extra money (Halk & Täger, 1998), and therefore this, in turn, leads to a systematic increase of firm revenues. Hence:

H1: Shop opening hours liberalization increases firms' revenues in the retail industry.

3.2. Liberalization effect on personnel costs

Shop hours liberalization effect on personnel costs has mixed evidence since the empirical analyses on this theme have not reached a common consensus (Paul, 2015). Prior scholars explain that increased opening hours have not affected employment and that it worsens the working time arrangements of employees (Jacobsen & Hilf, 1999). On the other side, studies show that an increase of opening hours pushes firms to spend more money on employees, and, therefore, employment increases (Bossler & Oberfichtner, 2017).

A change of employment as a consequence of the increase of opening hours is due to the fact that firms must make higher use of employees. In fact, in order to permit an increase of shop opening hours firms have to hire new employees or to extend the number of working hours for each employee (Goos, 2004). Despite the mixed evidence on the consequences of employment, most of the studies focused on liberalization agree on the positive impact on employment. Studies used changes of retail laws in order to analyse the effect of shop hours liberalization on employment, showing that the liberalization in the retail sector has a positive effect on employment (Skuterud, 2005). In his analysis, he found that liberalization of shop opening hours can bring to an increase of 8%-12% of employment in the retail sectors.

A shop level of needed labour includes a minimum volume of (fixed) work to guarantee a constant provision of employees during the extended shop opening times. Therefore, increasing shop opening hours is likely to influence the optimal labour demand by increasing the employees' costs it incurs (Paul, 2015).

H2: Shop opening hours liberalization increases firm personnel costs in the retail industry.

3.3. Liberalization effect on firm performance

Several countries currently have legal limitations on shop opening hours that have been lately come disputed, and in several circumstances, they have been reduced or completely removed. However, the matter is still under discussion, and it is intensely troubling that scholars have not yet added so much to explain the different issues of the topic. A significant deficiency of the previous analyses that should permit an examination of shop opening hours is that all focus only on individual aspects as personnel costs or revenues or employees' rights (Clemenz, 1994).

An argument not in favour of liberalization is that tougher competition can bring to an unreasonable number of shop opening hours. In fact, retailers compete in prices and also in opening hours (Wenzel, 2010), therefore, an increase of shop opening hours of only some retail firms brings the other firms to open in order to do not lose customers. The question, therefore, is whether the competitive outcome in shop opening hours can influence firm performance since is also related to the extra costs following the increase of shop opening hours.

The number of shop opening hours influences the costs for the firm in two modes: operating costs (net of employees' costs) show an increase, and employees costs show an increase (Clemenz, 1994). In fact, a higher number of employees is, a prerequisite to cover the supplementary hours of opening (Nooteboom, 1983). At the same time, an increase of the number of shop opening hours encourages sales (Gradus, 1996; Kügler & Weiss, 2013). The increase of the amount of the revenues is settled 1) by the elasticity to a variation of the number of shop opening hours under unchanged prices and 2) by the price elasticity to the liberalization (Paul, 2015). Since the consequences evolve into a firm's labour need within its productivity function, the mechanism influences the productivity of additional workers, the revenues consequences of the company (Skuterud, 2005), and therefore firm performance. Thus, the mechanism behind the link between the liberalization of shop opening hours and firm performance in the retail sector is based on consequences on sales and costs. As prior literature explains with theoretical models, if liberalization brings to longer shopping hours in all the retail firms, there is an overall reduction of the profits (Wenzel, 2011). This effect is due to the fact that firms increase too much the number of shop opening hours to compete with the competitors, and furthermore because liberalization tends to increase concentration in the retail sector, and consequently there is a relevant increase of competition able to reduce firm performance (Wenzel, 2010).

H3: Shop opening hours liberalization decreases firm performance in the retail industry.

4. RESEARCH METHOD

4.1. Sample and empirical setting

In order to examine the effect on firms of shop opening hours liberalization is necessary to have a regulatory framework applied to an identified group of firms over a determined amount of time. In fact, the needed setting to test our hypotheses should permit us to observe the variation in a firm's revenues, personnel costs, and performance, for firms affected by the liberalization of shop working hours. While finding a perfect context might be challenging, different elements make the Italian setting suitable for the actual analysis. First of all, Italy introduced national legislation in 2011 that completely liberalized days and hours of shopping

all over the country (Law Decree n. 201/2011 – *"Salva Italia"*). Therefore, this liberalization directly affected all the firms of the retail industry, while the firms of other industries are only indirectly affected with high or low magnitude. Second, for Italian firms is compulsory by law to disclose their financials to the Italian Chamber of Commerce. Therefore, the sample of firms used in this study is not affected by a sample selection bias. Third, the analysis on only one country decreases the risk of an omitted-variable problem of multi-country examinations where it is problematic to control for all the time-variant country characteristics concurrently influencing the dependent and the independent variables (de Jong, Kabir, & Nguyen, 2008).

To execute our analysis, we create a dataset with firm-level data. Firms' data are extracted from AIDA, a Bureau van Dijk database containing financial data on all Italian limited liability companies. We focused our analysis on firms with revenues over 5 million euro. Our sample of firm-level data contains a dataset of all the Italian limited liability companies with revenues higher than 5 million euro for at least one year in the period 2009-2015, that is composed of 69,643 firms. Our dataset contains a total of 487,503 firm-year observations.

Descriptive statistics for the variables and their pairwise correlations are reported, respectively, in Table 1 and Table 2. All data are computed at the end of each fiscal year.

Table 1. Descriptive statistics

	Observations	*Mean*	*SD*	*Min*	*Max*
Revenues	451,309	13,387	21,675	0	304,166
EBITDA	451,309	876	1,551	-2,508	17,113
Employees (n.)	451,309	42	59	0	493
Operating result	451,309	479	1,022	-2,509	7,030
Return on investments (ROI)	351,215	7	9	-30	30

*Note: * Revenues, EBITDA, and operating result are in '000 – we restricted the sample considering a percentage of censoring for revenues, EBITDA, employees, and operating result at 1%.*

Table 2. Correlation statistics

	Revenues	*EBITDA*	*Employees (n.)*	*Operating result*	*ROI*
Revenues	1.0000				
EBITDA	0.5587	1.0000			
Employees (n.)	0.4747	0.4868	1.0000		
Operating result	0.4571	0.8426	0.3291	1.0000	
Return on investments (ROI)	0.0180	0.1899	-0.0133	0.3825	1.0000

4.2. Variables description

4.2.1. Independent variable

The *liberalization* introduced by national legislation in 2011 in Italy (effective from 1st of January, 2012), totally liberalized shop opening hours and days all over the country, therefore, overcoming the distinction between touristic and non-touristic cities. The firms directly affected by the legislation were the retail companies that had to totally rethink the organization of the working hours of their shops. Our independent variable identifies the effects of the liberalization on two different kinds of firms: *affected* (firms in the retail sector) and *non-affected* (firms not in the retail sector). Liberalization takes a value of one for firms that are directly affected by the liberalization from 2012, and 0 otherwise.

4.2.2. Dependent variables

To capture the effect of liberalization on firms, we use firm-year data as revenues, personnel costs, and profitability.

Revenues. To measure the liberalization influence on firms' revenues, we use the natural logarithm of the revenues. In fact, according to prior studies, because revenues were nonnormal, we use the natural logarithm of this measure (Chadwick, Super, & Kwon, 2015).

Personnel costs. To measure the liberalization influence on firms' use of personnel, we use the number of employees (Rizzica et al., 2020). According to prior studies, because the numbers of employees were nonnormal, we use the natural logarithm of this measure (Chadwick et al., 2015).

Firm performance. In order to measure firm performance, we considered a proxy already used by the literature. According to arguments in prior studies, profitability is measured using return on equity (*ROE*) (Mascarenhas & Aaker, 1989). Therefore, we considered the variable *ROE*, as a performance indicator (Oehmichen, Schrapp, & Wolff, 2017). *ROE* is used because it is a ratio between net income and equity, and if is high, signifies that there are more profits. This measure has the advantage of being objective and based on publicly available data (Senderovitz, Klyver, & Steffens, 2016).

4.2.3. Control variables

We introduce several conventional control variables in our analysis in order to control for firm characteristics.

To control for firm size, we include the number of employees along with sales (Bromiley, Rau, & Zhang, 2017). We consider also variables to control for debt in the capital structure, using the debt-to-equity ratio (Anderson & Reeb, 2003; Chen & Steiner, 1999). Moreover, in order to control for profitability, we included return on assets variable (*ROA*) and earnings before interest, tax, depreciation, and amortization (*EBITDA*) (Anderson & Reeb, 2003; Mascarenhas & Aaker, 1989).

Moreover, we estimate our models including firms' fixed effects, which control for any firm time-invariant characteristic, including where the firm operates and its ownership (e.g., privately, publicly, or foreign-owned). We also include year fixed effects, which control for a yearly aggregate shock.

4.3. Analytical method

To measure the effectiveness of the liberalization on the firm – in terms of revenues, employees, and performance – we use a dynamic instructional design (DID) model. Using this method, we can assess the influence of the liberalization by comparing the changes in results over time among affected firms (firms directly affected by the liberalization) and non-affected firms (firms not directly affected by the liberalization). The model estimates the differential effect of the change induced by the liberalization through two different groups (Cerqueiro, Ongena, & Roszbach, 2016). Adopting this method we are able to ease concerns that confounding elements in the analysis influence the outcomes (Altamuro & Beatty, 2010). This DID model is implemented to detect the effects of specific regulation for two different groups: an "eligible" group composed of firms affected by the regulation (liberalization), and a "non-eligible" group composed of firms not affected by the regulation (liberalization). Through the DID model, firms affected by the regulation are matched to firms not affected by the regulation in a control sample to diminish the impact of unobserved effects (Shevlin, Thornock, & Williams, 2017). This approach permits to delete fixed differences between eligible and non-eligible groups and considers post-regulation variations for the firms not affected by the regulation as a counterfactual for what would have occurred if firms affected by the regulation had not been eligible for the liberalization (Gubler, Larkin, & Pierce, 2017).

The unit of analysis is the firm. Our methodology follows that of Cuñat, Gine, and Guadalupe (2012), who study the effect of governance proposals on firm value. In the specific, we estimate the following regression:

$$Y_{it} = \alpha + \beta * Liberalization_{it} + \delta X_{it} + \gamma_i + c_i + \varepsilon_{it} \tag{1}$$

where, Y is our dependent variable at time t for firm i; *Liberalization* is the "regulation dummy" – that is, a dummy variable equal to one if firm i is directly affected by the liberalization in year t. X_{it} is the vector of control variables, which includes revenues, the number of employees, return on assets, and the debt-to-equity ratio. γ_i represents year fixed effects, c_i represents firm fixed effects, and ε_{it} is the error term. The coefficient of interest is β, which measures the differential effect of the liberalization application for eligible versus non-eligible firms. For example, *H1* predicts that β should be positive and significant when Y_{it} is "revenues", meaning that the liberalization realization increases – in the post-regulation with respect to the pre-regulation period – the revenues of firms directly affected by the liberalization, more than the increase – in the post-regulation with respect to the pre-regulation period – firms not directly affected by the liberalization.

5. RESULTS

5.1. Regression analysis

Table 3 shows the regression estimates of the impact of the liberalization on eligible firms, with respect to non-eligible firms.

Table 3. Regression estimates of the impact of the liberalization on eligible firms, with respect to non-eligible firms

Variables	(1) Revenues (ln)	(2) Number of employees (ln)	(3) EBITDA (ln)
1.treated#1.after	0.0860***	0.0201***	-0.0560***
	[0.00909]	[0.00675]	[0.0109]
EBITDA (ln)	0.351***	0.0399***	
	[0.00631]	[0.00360]	
Number of employees	0.000110**		4.58e-05**
	[5.00e-05]		[1.88e-05]
Return on assets	-0.00898***	-0.00598***	0.0506***
	[0.00118]	[0.000688]	[0.00491]
Debt-to- equity ratio	-3.01e-05	7.80e-05	0.000463**
	[0.000185]	[8.61e-05]	[0.000202]
Year = 2010	0.0631***	0.000562	0.0284***
	[0.00236]	[0.00174]	[0.00307]
Year = 2011	0.118***	0.00222	0.0303***
	[0.00263]	[0.00206]	[0.00356]
Year = 2012, omitted	-	-	-
Year = 2013	0.00792***	0.0123***	0.0379***
	[0.00190]	[0.00134]	[0.00275]
Year = 2014	0.0299***	0.0248***	0.0768***
	[0.00216]	[0.00164]	[0.00331]
Year = 2015	0.0684***	0.0390***	0.107***
	[0.00235]	[0.00194]	[0.00384]
Revenues (ln)		0.309***	0.607***
		[0.00616]	[0.0110]
Constant	6.808***	0.330***	0.390***
	[0.0332]	[0.0520]	[0.0772]
Observations	399,662	379,796	399,662
R-squared	0.267	0.167	0.417
Number of id	74,729	72,566	74,729
Year FEs	Yes	Yes	Yes
Firmid	Yes	Yes	Yes

*Note: Robust standard errors in brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.*

Analyses show that eligibility for the liberalization has a relevant influence on firm revenues (Column 1 of Table 3), since the effect is positive and statistically significant. This result supports *H1* and is consistent with prior studies that explain how an increase of shop opening hours positively affects clients' motivation to buy firm products (Kügler & Weiss, 2013), and, therefore, leading to the systematic increase of firm revenues. As expected by *H2*, we find that eligibility for liberalization of shop opening hours increases the number of employees of firms directly affected by the liberalization in comparison with firms not directly affected by the liberalization. As shown in Column 2 of Table 3, the effect is positive and statistically significant, with an increase of the number of employees. Consistent with *H2*, liberalization of shop opening hours pushes firms to increase the number of employees.

As predicted by *H3*, we find that eligibility for liberalization of shop working hours decreases performance among eligible firms compared with non-eligible firms. As shown in Column 3 of Table 3, the effect is negative and statistically significant, with a decrease of performance in terms of *EBITDA*. Consistent with *H3*, the liberalization of shop working hours reduces firm performance.

5.2. Robustness checks

In this section, we present some robustness checks of our baseline analysis, in order to assess the significance of our findings. Overall, these additional checks provide evidence that our findings are robust to different specifications.

Different censoring. As a first robustness check, we restricted the sample considering different percentages of censoring. Tables 4 and 5, and 6 show the estimated effect of the liberalization application on firm revenues, employees, and performance considering a change in the sample size due to censoring of one percent, two percent, and three percent. Considering the different specifications, the effect with different sizes of censoring remains statistically and economically significant.

Table 4. Censoring 1% - Robustness checks

Variables	(1) Revenues (ln)	(2) Number of employees (ln)	(3) EBITDA (ln)
1.treated#1.after	0.0866***	0.0163**	-0.0492***
	[0.00918]	[0.00658]	[0.00982]
EBITDA (ln)	0.350***	0.0395***	
	[0.00650]	[0.00359]	
Number of employees	0.000159		3.91e-05*
	[0.000115]		[2.03e-05]
Return on assets	-0.00900***	-0.00589***	0.0556***
	[0.00123]	[0.000692]	[0.00452]
Debt-to-equity ratio	-2.94e-05	8.11e-05	0.000499**
	[0.000186]	[8.65e-05]	[0.000208]
Year = 2010	0.0629***	0.00132	0.0295***
	[0.00237]	[0.00172]	[0.00310]
Year = 2011	0.117***	0.00403**	0.0320***
	[0.00266]	[0.00202]	[0.00356]
Year = 2012, omitted	-	-	-
Year = 2013	0.00766***	0.0123***	0.0388***
	[0.00192]	[0.00132]	[0.00274]
Year = 2014	0.0306***	0.0244***	0.0761***
	[0.00219]	[0.00162]	[0.00318]
Year = 2015	0.0689***	0.0388***	0.104***
	[0.00240]	[0.00192]	[0.00350]
Revenues (ln)		0.303***	0.597***
		[0.00598]	[0.0106]
Constant	6.781***	0.353***	0.426***
	[0.0336]	[0.0502]	[0.0753]
Observations	395,509	375,589	394,864
R-squared	0.267	0.168	0.431
Number of id	74,227	71,999	74,268
Year FEs	Yes	Yes	Yes
Firmid	Yes	Yes	Yes

Note: Robust standard errors in brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5. Censoring 2% - Robustness checks

Variables	(1) Revenues (ln)	(2) Number of employees (ln)	(3) EBITDA (ln)
1.treated#1.after	0.0751***	0.0153**	-0.0489***
	[0.00763]	[0.00663]	[0.00988]
EBITDA (ln)	0.277***	0.0392***	
	[0.00388]	[0.00357]	
Number of employees	0.000133		4.08e-05
	[9.95e-05]		[2.57e-05]
Return on assets	-0.00611***	-0.00590***	0.0559***
	[0.000648]	[0.000691]	[0.00467]
Debt-to-equity ratio	-9.06e-05	9.28e-05	0.000494**
	[8.97e-05]	[8.43e-05]	[0.000211]
Year = 2010	0.0657***	0.00223	0.0298***
	[0.00184]	[0.00171]	[0.00312]
Year = 2011	0.117***	0.00495**	0.0321***
	[0.00209]	[0.00202]	[0.00358]
Year = 2012, omitted	-	-	-
Year = 2013	0.00721***	0.0120***	0.0387***
	[0.00152]	[0.00132]	[0.00277]
Year = 2014	0.0301***	0.0241***	0.0763***
	[0.00180]	[0.00161]	[0.00322]
Year = 2015	0.0696***	0.0386***	0.105***
	[0.00202]	[0.00191]	[0.00355]
Revenues (ln)		0.297***	0.595***
		[0.00591]	[0.0107]
Constant	7.223***	0.386***	0.413***
	[0.0205]	[0.0492]	[0.0753]
Observations	389,286	371,423	390,065
R-squared	0.257	0.165	0.428
Number of id	73,556	71,438	73,864
Year FEs	Yes	Yes	Yes
Firmid	Yes	Yes	Yes

*Note: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Table 6. Censoring 3% - Robustness checks

Variables	(1) Revenues (ln)	(2) Number of employees (ln)	(3) EBITDA (ln)
1.treated#1.after	0.0648***	0.0131**	-0.0485***
	[0.00686]	[0.00665]	[0.00995]
EBITDA (ln)	0.247***	0.0385***	
	[0.00317]	[0.00355]	
Number of employees	0.000130		4.00e-05
	[9.95e-05]		[2.62e-05]
Return on assets	-0.00443***	-0.00578***	0.0561***
	[0.000489]	[0.000684]	[0.00479]
Debt-to-equity ratio	7.93e-07	8.38e-05	0.000501**
	[7.54e-05]	[8.45e-05]	[0.000214]
Year = 2010	0.0654***	0.00276	0.0292***
	[0.00170]	[0.00172]	[0.00314]
Year = 2011	0.117***	0.00579***	0.0319***
	[0.00193]	[0.00202]	[0.00362]
Year = 2012, omitted	-	-	-
Year = 2013	0.00704***	0.0122***	0.0393***
	[0.00140]	[0.00131]	[0.00279]
Year = 2014	0.0290***	0.0243***	0.0765***
	[0.00168]	[0.00162]	[0.00325]
Year = 2015	0.0669***	0.0388***	0.105***
	[0.00190]	[0.00192]	[0.00359]
Revenues (ln)		0.294***	0.595***
		[0.00591]	[0.0107]
Constant	7.398***	0.393***	0.397***
	[0.0171]	[0.0490]	[0.0752]
Observations	381,824	367,238	385,270
R-squared	0.249	0.163	0.426
Number of id	72,772	70,825	73,448
Year FEs	Yes	Yes	Yes
Firmid	Yes	Yes	Yes

*Note: Robust standard errors in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

Results might be influenced by an omitted-variable problem if relevant controls simultaneously affecting the dependent and independent variables are not considered in the model. To measure the sensitivity of our results to the inclusion of other important controls, we considered an alternative model including additional hypothetically important control variables. Using different control variables, we obtain similar results (see Table 7).

Table 7. Inclusion of further control variables – Robustness checks

Variables	(1) Revenues (ln)	(2) Number of employees (ln)	(3) EBITDA (ln)
1.treated#1.after	0.0834***	0.0120*	-0.0538***
	[0.00845]	[0.00657]	[0.0105]
EBITDA (ln)	0.327***	0.0230***	
	[0.00420]	[0.00188]	
Number of employees	9.40e-05**		
	[4.33e-05]		
Return on equity	-0.00260***	-0.00136***	0.0139***
	[8.18e-05]	[5.23e-05]	[0.000119]
Financial debt/revenues	-0.00496***	0.00183***	0.00203***
	[0.000127]	[9.26e-05]	[0.000147]
Year = 2010	0.0681***	-4.89e-05	0.0105***
	[0.00208]	[0.00173]	[0.00317]
Year = 2011	0.123***	-0.000482	0.0159***
	[0.00232]	[0.00207]	[0.00352]
Year = 2012, omitted	-		-
Year = 2013	0.00379**	-0.0304***	0.0658***
	[0.00169]	[0.00172]	[0.00276]
Year = 2014	0.0274***	-0.0163***	0.102***
	[0.00195]	[0.00138]	[0.00308]
Year = 2015	0.0671***		0.116***
	[0.00215]		[0.00335]
Revenues (ln)		0.349***	0.724***
		[0.00641]	[0.00710]
Year = 2012		-0.0423***	
		[0.00191]	
Constant	7.054***	0.0254	-0.585***
	[0.0259]	[0.0546]	[0.0651]
Observations	377,448	361,423	377,448
R-squared	0.306	0.176	0.386
Number of id	72,423	70,677	72,423
Year FEs	Yes	Yes	Yes
Firmid	Yes	Yes	Yes

*Note: Robust standard errors in brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.*

In order to assess the validity of our results, we use different dependent variables that explain the same mechanisms. To analyze the sensitivity of our results to the change of the dependent variable, we specified an alternative model considering other variables already used in prior studies (Aliabadi, Dorestani, & Balsara, 2013; Sheela & Karthikeyan, 2012). We consider different proxies to measure performance; in the specific, we consider the variable *EBITDA* variation in relation to the average value, operating result, *ROI, ROE, ROA*. To measure the effect on employees, we consider the total cost of employees (in natural logarithm). Using different dependent variables, we obtain similar results (see Table 8).

Table 8. Change of dependent variables – Robustness checks

Variables	(1) EBITDA variation	(2) Operating result	(3) Return on investments	(4) Return on equity	(5) Return on assets	(6) Employees cost (ln)
1.treated#1.after	-0.0708***	-0.0630***	-0.378***	-2.173***	-1.238***	0.0535**
	[0.0117]	[0.0144]	[0.106]	[0.400]	[0.232]	[0.0265]
Revenues (ln)	0.704***	0.616***	0.440***	5.601***	3.147***	
	[0.00762]	[0.0162]	[0.129]	[0.137]	[0.112]	
Number of employees	3.08e-05**	3.46e-05***	-0.000110*	-0.00155**	-0.000437**	
	[1.20e-05]	[1.07e-05]	[6.16e-05]	[0.000737]	[0.000206]	
Return on asset		0.0715***	1.548***			-0.0110***
		[0.00871]	[0.0735]			[0.00149]
Debt-to-equity ratio	0.000108	0.000574**	-0.00295***	-0.120***	0.00615***	0.000302*
	[0.000161]	[0.000289]	[0.000690]	[0.0137]	[0.00227]	[0.000175]
Year = 2010	0.0240***	0.0160***	0.0534**	1.176***	0.176***	0.0375***
	[0.00357]	[0.00450]	[0.0257]	[0.115]	[0.0478]	[0.0128]
Year = 2011	0.0170***	0.0336***	0.00879	-0.466***	-0.299***	0.0715***
	[0.00394]	[0.00539]	[0.0261]	[0.126]	[0.0573]	[0.0117]
Year = 2012		-0.155***			-0.173**	
		[0.00492]			[0.0742]	
Year = 2013	0.0420***	-0.0913***	0.139***	-1.548***	-0.193***	0.0541***
	[0.00306]	[0.00514]	[0.0254]	[0.102]	[0.0733]	[0.0100]
Year = 2014	0.0898***	-0.0319***	0.156***	-0.682***	-0.0104	0.0837***
	[0.00344]	[0.00357]	[0.0409]	[0.113]	[0.0627]	[0.0103]
Year = 2015	0.130***		0.0969*	0.870***		0.124***
	[0.00373]		[0.0559]	[0.119]		[0.0107]
EBITDA (ln)						0.170***
						[0.00826]
Constant	-6.377***	-0.372***	-2.208**	-40.86***	-23.47***	9.982***
	[0.0683]	[0.0955]	[0.927]	[1.234]	[0.988]	[0.0452]
Observations	401,815	368,725	364,457	420,945	441,600	374,309
R-squared	0.233	0.398	0.663	0.027	0.027	0.005
Number of id	74,842	73,327	71,402	75,453	76,490	72,052
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Firmid	Yes	Yes	Yes	Yes	Yes	Yes

*Note: Robust standard errors in brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.*

6. CONCLUSION

The influence of environmental issues as liberalization on firms is a relevant topic. This study investigates whether the introduction of deregulation (i.e., a liberalization of shop opening hours) may influence the firms affected by the policy in terms of revenues, employees, and performance.

Liberalization, considered a form of deregulation, is one of the key current issues that firms have to consider in order to implement strategies. In fact, we argue that some kinds of liberalization (e.g., liberalization of shop opening hours) could have unplanned negative consequences by inducing firms directly influenced by the deregulation to spend more than how much they earn, and therefore to lose profits.

In the specific, we evaluate the causal implications of shop opening hours liberalization in Italy, considering the revenues, employee costs, and profitability in the retail sector in Italy. According to prior studies (Rizzica et al., 2020), we find a positive effect of the shop opening hours liberalization on revenue and employee costs. Moreover, we also find a negative effect of shop opening hour's liberalization on profitability.

Those results can be explained by the fact that firms plan their strategy considering the competitors' behaviour. In fact, when deregulation as shop opening hour's liberalization is announced, firms tend to react as the competitors do in line with the scope of the liberalization, therefore increasing the number of shop opening hours. This is induced by the fact that an increase of shop opening hours of one firm is expected to proportionally push client demand for this firm (Economides, 1989); therefore, the other firms react in consequence of this. However, increasing the shop opening hours brings to an increase of employees costs (Bossler & Oberfichtner, 2017), as well as of revenues (Kügler & Weiss, 2013). Nevertheless, even if an increase of shop opening hours positively affects clients' motivation to buy firm products (Kügler & Weiss, 2013), and brings active customers to spend extra money (Halk & Täger, 1998), revenues are not subject to a so significant increase able to repay all the extra operating costs. Consequently, firms lose profitability.

Our findings contribute to the literature on firm outcomes as consequences of a specific kind of liberalization, and the effects on performance. First, our results enrich our knowledge of the determinants of firm decisions after liberalization, showing that generally, firms follow the behaviour of the competitors, which is in line with the scope of the liberalization. In this way, our study helps to address the lack of empirical findings related to the consequences of a specific kind of liberalization in terms of firm performance.

These findings could be of interest to managers and policymakers. The principal implication is that policies aimed at liberalizing a sector may actually have unplanned negative effects. More broadly, our findings show that programs designed for "good" reasons could paradoxically have negative consequences, worsening the conditions of the beneficiaries. Therefore, future liberalization programs should be carefully designed to maximize the firm benefits and minimize the negative consequences.

For example, such programs may be designed to induce beneficiaries to coordinate with each other in a determined way, without harming themselves. Since liberalization programs are concessions provided by the government, the latter may identify ex-ante how firms should react, pushing them to take efficient decisions. In fact, governments have access to firm's information and therefore can monitor how firms make decisions in a changing environment. If firms misuse liberalization programs, issuers can suspend the policy and do not deregulate the sector.

Like any study, our work presents limitations that stimulate future research. First, our analysis fosters interrogations regarding firm behaviour in a changing environment. In particular, we analyze certain outcomes that show negative consequences of firm's active in industries with new liberalization, but we did not analyze other relevant outcomes that can prove positive consequences. Although our conclusions suggest that industry liberalization can harm firms in terms of performance, they do not imply that there are no value-enhancing consequences.

Second, this study is focused on a single country setting. Whereas the focus on a single country reduces several empirical problems (e.g., omitted variable at the country level, unobserved firms' differences across countries), it is unclear whether firms in other countries or regions would react similarly, for instance, due to different cultural elements and social capital. Future studies may explore whether differences across regions or countries could influence firms' reaction to liberalization programs due to the presence of different national institutions.

Third, we perform the analysis during the recent financial crisis, when there was a diffusion of different industry liberalizations. While this represents an important contribution, our study cannot be easily generalized to periods of financial stability, during which firms might react differently to these programs. Comparing the effects of liberalization policies during periods of financial instability and stability is a significant question that deserves further attention by scholars and policymakers.

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