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Cultural exception? The impact of price regulation on prices and variety in the market for books

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Abstract
Fixed book price (FBP) agreements are a form of resale price maintenance applied to books in various countries. FBP restricts retail price competition with the aim of promoting book production variety. Yet, despite its popularity and adoption in many countries, there is no empirical evidence on its effects. We offer systematic evidence on the impact of FBP on book variety and prices using a detailed new dataset from Italy that includes the universe of books published and bought, before and after the introduction of FBP. Our results indicate that FBP raises prices without significantly affecting the number of new books published in the marketplace. However, it also increases considerably the variety of books actually bought, especially from independent bookstores. We estimate a structural model of demand that accounts for both effects, finding that consumers overall benefited from the regulation.

Keywords: cultural goods, resale price maintenance, book market, ex-post policy evaluation
JEL codes: L1; L4; L5; Z1

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We dedicate this paper to the loving memory of Mario Pagliero, a brilliant economist and dear friend, who passed away too soon.

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1. Introduction

Markets work well in the absence of externalities. Culture brings many externalities to society, and this is why it is often advocated that cultural products should not be left to market forces alone. Books belong to this category. Educational books, scientific books, recreational books: they all contribute to broader societal benefits. Hence, it is not surprising that governments have intervened in various ways, from subsidising libraries, to offering grants for authors and publishers, and tax reliefs for the book sector.

Yet books are produced and sold in the marketplace, typically through a vertical chain that involves publishers upstream and distributors downstream (booksellers). One of the most common, and controversial, interventions in this chain has been the so-called fixed book price (FBP) regulation. This is a form of resale price maintenance that allows publishers to pre-determine, or influence to a large extent, the retail price at which a book can be sold to the public.

FBP is widespread. At the time of this writing, at least 13 European countries had various forms of FBP regulations in place. FBP is formally exempt from EU competition rules as books are deemed "objects of culture". Moreover, this regulation is also present in Argentina, Japan, Mexico and South Korea, while Israel abandoned it in recent years. Famously, the UK – home to some of the most important publishers worldwide – had a similar agreement (called Net Book Agreement) for a whole century, from 1899 until it was repealed in 1997. The US discussed its introduction at various times in history, but never adopted it.[5]

The rationale mentioned by policy makers that champion FBP is variously articulated around the promotion of a greater variety of books, the protection of smaller publishers as well as independent bookshops, especially in light of the disruptive impact of e-commerce (Amazon). FBP is meant to ensure that booksellers have a guaranteed margin on blockbusters, which may encourage the supply of better services to readers and the promotion of more diverse books rather than only concentrating on and catering to readers of blockbusters. More titles could be published, the argument goes, and more bookshops could carry a varied assortment of popular and less popular books that address smaller markets or specialist readers that otherwise would not be commercially viable. By shielding margins, book price regulation could protect small, local and

[5] https://en.wikipedia.org/wiki/Fixed_book_price

independent bookstores from the competition of big bookstore chains, and online retailers. At the same time, FBP is a direct impediment to price competition, with a corresponding reduction in the volumes of books sold. This hurts the interests of book buyers.

In this paper, we look at the case of Italy. We exploit changes in the law that, in September 2011, introduced FBP (the "Levi Law"). More specifically, the law imposed a cap on the maximum discount that bookshops could offer on the recommended cover price set by the publisher. We observe monthly data on the universe of books sold in the country over the period 2009-2014, including the titles published, their recommended cover prices set by the publishers, and the discount offered by retailers.

We concentrate on the most important variables that are impacted by FBP and that emerge directly from the literature and the policy discussion: book prices and book variety. Our dataset is particularly interesting as it distinguishes sales by different retail channels. In Italy, books are sold mostly by large chain bookstores and by independent bookstores.[6] Most of the largest publishers directly own a (different) chain. E-commerce was still in its infancy at the time. The biggest impact of Amazon, that entered the Italian market also in late 2011, was most likely to accelerate the legislative process that led to the adoption of the Levi Law.

The main empirical challenge for a law that applied nationwide is to find a suitable control group. Fortunately, Italian is also one of the official languages of Switzerland, besides Italy (and no other country worldwide), and had no FBP during the period we cover. We therefore can compare similar books, sold in Italy and Switzerland, before and after the introduction of FBP in Italy alone.

Relying on the comparison between Italy and Switzerland, we first establish a series of facts on the causal impact of FBP in a set of reduced-form regressions, using a difference-in-differences methodology. Concentrating first on price, we find that, on average, FBP increased book prices only slightly (+1.4%), but this average effect hides a large heterogeneity. Independent bookshops significantly increased their prices (+7.8%), while chain bookstores marginally decreased their prices (-0.6%). Upstream, book publishers did not change their recommended cover prices, with

[6] During the period covered, books were also sold via supermarkets and e-commerce. We do have data about these channels as well, but they played a more limited role over the period. Hence, we conflate them with large chain bookstores in the main analysis, and further consider them in a robustness check. See also Section 2.2 below for further discussion.

no difference between small and large publishers. Since the actual selling price is the difference between the book cover price and the retailer's discount, all the price effects therefore come from a change in the discounts offered by bookshops (indeed it is this discount that is capped by the law).

When it comes to book variety, we find again a stark distinction between upstream publishers and downstream bookshops. As with cover prices, we find no evidence of any impact on publishers: there is no change in the number of new book titles published in Italy before and after the regulation. Instead, we find a significant impact on the number of titles that are sold by bookshops. Books are very heterogenous in terms of sales, with a limited number of titles capturing most sales, and a very long tail of books that are published but sells nothing or very little. We find that an effect of the law was to turn many of these zero or near-zero sales into positive sales, thus reducing the concentration in sales of published books. We therefore document, for the first time, that a larger variety of books was actually bought, although not produced, in Italy as a result of the Levi Law. This effect is particularly strong among independent bookshops.

Endowed with these stylized facts on prices and book variety sold by different channels, in the second part of the paper we estimate the demand for books in Italy in order to quantify the impact of FBP on readers. We follow the literature on discrete choice models and estimate nested Logit models (where the nest is either the book, or the book genre). Our price elasticity estimates suggest that FBP – ignoring variety effects – has reduced consumer welfare by about 39 million euros in the two years after the introduction of the law, and it is concentrated among independent bookshops, who reduced considerably the discounts they offered. However, we also estimate that, post FBP, demand expanded, especially for independent bookshops. We attribute this demand expansion to greater service effort post-reform: prior to the reform, service effort suffered from a free riding problem as readers could get advice from a bookshop, but then buy the book elsewhere at a cheaper price. This effect increased consumer welfare by almost 116 million euros. The net effect is positive, around 77 million euros, for the two years following the adoption of FBP.

Our conclusion is that the law muted and much reduced the role of price competition among booksellers. But competition was still at work, and turned to non-price aspects that overall seem to have benefited readers in the Italian book market. We corroborate this interpretation by providing two additional pieces of evidence. First, we look at employment. We find that FBP

regulation is associated with higher levels of employment in bookshops – this effect is limited though to very small bookshops with a couple of employees – which are the archetypical independent bookshop in Italy. Second, we assemble and analyse a large set of Google reviews and ratings about bookshops in Italy. Our findings suggest that ratings of bookshops are generally very positive, especially those of independent bookshops. Employing machine learning, we further classify reviews around topics and the sentiment about them. Book buyers who left reviews are generally positive about topics that lie at the core of the service effort mechanism: readers appreciate book discovery, suggestions from staff, and events organised by the bookshops. The sentiment is particularly positive for independent bookshops when compared to chain bookshops.

The remainder of the paper is organized as follows. Section 2 details the Italian FBP regulation, and relates our work to the existing literature. Section 3 describes our datasets. Our empirical strategy then proceeds in two steps. First, in Section 4, we identify the regulation's effect on book prices and variety using a reduced-form approach. We distinguish there between effects upstream (among publishers) and downstream (among bookshops). Then, in Section 5, we estimate a structural model of demand which allows us to conduct a welfare assessment of the impact of FBP regulation. Section 6 discusses the mechanisms that could generate our results. Section 7 concludes and suggests policy implications of our findings.

2. Background

2.1 FBP regulation and the Levi Law

The Italian FBP regulation, known as "Legge Levi" (Levi Law), came into effect on September 1st, 2011.[7] The law states two main objectives. The first one is to support the production of books, thus increasing book variety in the marketplace. The second one is to foster the diffusion of book titles through a widespread network of brick-and-mortar bookstores. These should then stimulate book readership, literature diffusion, and information pluralism, thereby generating positive spillovers for the society as a whole.

[7] https://www.gazzettaufficiale.it/eli/id/2011/08/05/011G0168/sg. Levi was the Italian MP who proposed the law.

The main provision of the regulation imposes a *maximum* discount retailers can deduct from book cover price, which is set in advance by the book publisher. According to the Italian FBP regulation, retailers cannot charge a discount higher than 15% off the cover price.[8] This rule applies to all new printed books.

FBP has received mixed responses from its introduction. Those in favor of the Levi Law emphasize the importance of FPB in fostering book readership and cultural variety. The public debate has mainly focused on the protection of independent brick-and-mortar bookstores against the increased competition from online retailers. In particular, the main threat came from Amazon, which opened its Italian website in November 2010. An Italian Senator claimed, during a public debate at the time of the approval of the law, that the loss of independent booksellers would be a damage to culture. Publishers, both large and small, represent a well-organized lobby and have typically been in favor of the law.[9]

On the contrary, the opponents of the FBP regulation have pointed out the damage for consumers from reduced retail price competition in the book market. This would increase prices, reduce volume sales and possibly innovation in the book retail sector. Accordingly, the regulation would lessen book diffusion and readership, thus achieving the opposite effect as intended by the law. The Italian Competition Authority was particularly critical of the FBP regulation from its inception.[10]

A draft of the law was first approved by the upper house of the Italian Parliament (Senato) in March 2011, and then confirmed by both houses (Senato and Camera dei Deputati) in July 2011. The law entered into full force on September 1st, 2011. In our data, we code as "post" intervention, all data after September 2011, and as "before" data, all those prior to March 2011. Since the first reading approved by the Senate was already a strong signal that the law would be eventually approved, we also further distinguish as "mid" (interim) period all observations between March and September 2011, to check for any anticipatory effects the law might have produced.

[8] There are only two exceptions to the 15% rule. First, publishers can promote temporary sales campaigns for selected book titles that can receive a maximum discount of up to 25% off the cover price for up to a month per year (but not in December, since most books are sold during the Christmas period). Second, retailers are free to set any discount for books published for at least 20 months that have not realized sales for at least 6 months.

[9] See, e.g., Piccoli e grandi editori uniti «Gli sconti fanno male ai libri» - Corriere.it. This article was published in the largest Italian newspaper, which is owned by the largest Italian publisher.

[10] See, e.g., the proposed reforms by the Italian Competition Authority (pages 24 and 25).

Despite the controversy around FBP, the Italian Government has recently decided to further restrict retail price competition in the book market. An amendment to the 2011 Law has come into effect in March 2020, and limits book discounts to at most 5% off the cover price. These latest developments are not covered in our dataset.

2.2 Amazon, e-commerce and e-books

The remarkable rise of e-commerce is a global phenomenon. Amazon famously started its journey by selling books online. This success story has occurred at a different pace in different parts of the world. It is thus important to clarify the impact that e-commerce and related digital products might have had in the specific context of the market we study. We argue that, during the period covered by our analysis, e-commerce generally and Amazon specifically, did not play a particularly relevant role in the case of books in Italy, which were still a product largely sold via brick-and-mortar stores.

We do have information about sales via e-commerce in our dataset, which covers the universe of book sales in Italy over 6 years (2009-2014) centered around the introduction of the Levi Law. This channel, which includes Amazon, represents around 10% of sales over the period, with an increasing trend over time but still, the majority of sales was done through traditional channels rather than online ones. The website Amazon.it was launched late in 2010, and Amazon opened its first distribution site in October 2011. As we mentioned in the Introduction, the success of e-commerce and Amazon in other countries was anticipated by the industry players and the regulators, and it is very likely to have triggered the introduction of FBP and retard the impact of e-commerce – which did eventually happen, but with a lag with respect to other countries.

In Switzerland, which we employ as a control group, Amazon's entry happened even much later (2018), well outside our period of investigation. Books sold via e-commerce in Switzerland were limited to the extent that the data provider does not collect sales from this channel separately.

Similarly, sales of e-books were on the rise but did not represent a material phenomenon that can affect our analysis. E-books sales represented 0.1% of total sales in 2010, increasing to 3.4% in 2014.

The question as to whether RPM-type regulations could have encouraged a shift from physical books towards other digital formats, or impacted on the speed of e-commerce growth, is a very interesting one that we do not address in this paper as our data show that Italy was still in an early phase of its digital development.

2.3 Relation to the literature

The question of the regulation of book prices has received attention both in policy and in economics for a long time. As early as 1915 one can find an article published in the *Quarterly Journal of Economics* discussing the diverging paths taken at the time by England and Germany on one side, as opposed to the US, where the former relied on FBP but not the latter (Tosdal, 1915).[11] In the US, attempts to maintain prices reached the Supreme Court that in 1913 declared them contrary to the Sherman Act: copyright by publishers over a book did not give them power to fix their resale price. In England, formal book trade associations existed since 1802, and in 1850 trade regulations were issued to prevent booksellers from granting discounts to readers in excess of 10 percent. The Net Book Agreement between the Publishers Association and booksellers operated between 1899 until it was repealed in 1997 and then it was ruled illegal.[12]

This intense policy debate was recognized by academic economists who studied the pros and cons of a system of resale price maintenance (RPM) between a manufacturer and a reseller. In the early literature, Taussig (1916) connected RPM to attempts to contrast "irrational" consumer behaviour that associates price with quality. Silcock (1938) made several insightful points, including that RPM can reduce the temptation of consumers to shop around. Basil Yamey, one of the most prominent industrial economists in Britain in the 50s and 60s, wrote an influential book on the economics of RPM making several references to FBP (Yamey, 1954). The discussion that ensued included heated responses (see, e.g., Andrews and Friday, 1962). Yet, all these contributions were not formalized using economic modelling, by modern standards. With the Chicago School, and in particular with Telser (1960), we encounter a first – still rudimentary –

[11] Harry Tosdal was an eminent economist who taught both at MIT and Harvard for 40 years in the first half on the 20th century. He was also the founding editor of the *Harvard Business Review*.

[12] The case of the fixed book price agreement in the UK was not imposed by regulation, but it was a "gentlemen" agreement between the Publishers Association and booksellers, which set the prices at which books were to be sold to the public. The agreement was concerned solely with price maintenance and it collapsed when some large bookshop chains started giving higher discounts.

model of the impact of RPM. Telser (1960) introduced the "service effort" argument. By limiting downstream competition over prices, RPM can generate positive effects on consumer demand by giving additional incentives to retailers to put effort and supply more customer services. We anticipate this important effect here as it will play a central role in our empirical analysis.

The theoretical literature burgeoned in 80s with the advent of applied game theory. As mentioned above, FBP is an example of RPM, a form of vertical restraint, in a context where a good is sold through a vertical chain. RPM is a contract in which an upstream manufacturer and a downstream distributor (a retailer) agree to a minimum or maximum price the retailer will charge its customers (see, e.g., Mathewson and Winter, 1988). There is a very rich literature in Industrial Organization on vertical restraints generally, and RPM specifically (see Rey and Tirole, 2007, for a survey). On the positive side for welfare, RPM can be used to elicit effort avoid a "free riding" problem among distributors (Marvel and McCafferty, 1984): since demand can be affected by retail services (e.g. pre-sale display, product-specific information, store hours, adequate inventory, post-sale service), a manufacturer may use RPM to insure that reputable retailers – those who help the manufacturer build and maintain a good reputation for its brand – carry its brand by affording those retailers protection from free-riding discounters. RPM can also lead to increased inventories under demand uncertainty (Deneckere et al., 1996). On the negative side, RPM eliminates or constrains price competition and is a practice that facilitates horizontal agreements, such as the formation and maintenance of cartels among manufacturers (Mathewson and Winter, 1998; Jullien and Rey, 2007, Rey and Vergé, 2010). RPM can also have exclusionary effects that act against the entry of competing manufacturers (Asker and Bar-Isaac, 2014).

This literature is largely theoretical. We contribute by providing empirical evidence on the impact of a particular form of RPM on prices and on variety in a relevant market in a large country. Existing empirical work is very scarce. Earlier work includes Ippolito (1991) who analyzed 206 public and private legal RPM cases brought between 1976 and 1982 in the US. More recently, Bonnet and Dubois (2010) estimate a demand model for bottled water in France and conduct tests that support the presence of RPM contracts.[13]

[13] Ongoing work include MacKay and Smith (2014) who exploit a 2007 US Supreme Decision (*Leegin*) that resulted in state-by-state variation in the treatment of RMP, and Xia (2023) who studies an antitrust case in the Chinese pharmaceutical industry.

As anticipated in the Introduction, several countries have experimented over time with various forms of FBP. The richness of the potential effects of FBP naturally lends itself to empirical work. Indeed, studies exist documenting some national experiences, especially those that went through changes in the pricing regime, or relying on fairly aggregate cross-country comparisons among countries with different regimes (Overstreet, 1983; Bittlingmayer, 1998; Utton, 2000; Appelman, 2003; Canoy et al., 2006; OFT, 2008; Løyland and Ringstad, 2012; Williams, 2024). Probably due to the lack of good micro data, and to the difficulty of finding a suitable control group, these studies and reports, though, are more limited in scope and fall short of determining the causal impact of FBP. To our knowledge, ours is the first study to assess the causal impact of FBP on book prices and variety, and to compute the overall welfare effect on book buyers.[14]

Last, our paper belongs to the wider field on the economics of culture (see, e.g., Thorsby, 2001, and the two volumes of the Handbook of the Economics of Art and Culture, Ginsburgh and Thorsby, 2006 and 2013). We look specifically at the economics of books. Despite being narrower in scope, this is also an active area of research among economists; see for instance the review by Canoy et al. (2006). Waldfogel (2017, 2018) considers several cultural goods, including books, in the more recent digital era. He argues that digital technologies have created a renaissance of new cultural products that consumers enjoy and that would not have been created otherwise.[15] In this work, we discuss how regulation in the market for books affects the balance of competition between price and non-price aspects, and how this balance depends on the sales channels.

3. Data

3.1 Dataset construction

Our main dataset comes from GfK Point of Sales (POS) which tracks and collects monthly retail data for the universe of books traded in Italy from January 2009 to December 2014, while the Levi Law was introduced in 2011. For each book title - identified by a unique ISBN code - we observe quantity of sales and average retail prices by retail channel. Retail channels include:

[14] Daljord (2022) exploits Norway's FBP to identify consumers' discount factor for books seen as a durable good. His interest, however, does not lie in estimating the impact of FBP itself.

[15] Reimers and Waldfogel (2021), and Peukert and Reimers (2022) study books in contexts different from ours. The first looks at the impact of book reviews on demand, and the second at book publishing deals between publishers and authors.

independent bookstores, vertically integrated chain bookstores, e-commerce, and supermarket chain stores. For each ISBN, we also observe time-invariant characteristics such as recommended cover price, book title, author, publisher, format (hardcover vs. paperback edition), and the date of publication.

As we can distinguish between the actual retail price of a book and its recommended cover price, we are able to compute the average book discount at each point in time, by retail channel. Moreover, given the book date of publication, we can derive a monthly measure of book age, defined as the difference between the date of sale and the date of publication. Finally, GfK allocates ISBNs over three-digit categories identifying the genre of the book. The upper level (Genre I) consists of four categories, while the middle (Genre II) and lower (Genre III) levels collect 25 and 97 sub-genres, respectively.

To assess the causal impact of FBP on price and variety, we complement these data with GfK POS tracking data from the Swiss market, which provides an ideal control for three reasons. First, Italian is one of the three main official languages of the Swiss Federal Republic, alongside French and German. Second, Switzerland is one of the few European countries that does not apply any form of FBP regulation. An attempt to introduce the FBP was rejected by a referendum in March 2012, while Italy approved the regulation a year earlier. This suggests the two markets shared a similar institutional background, with Switzerland taking a different regulatory path compared to Italy. Third, a sizable number of Italian titles are sold in Switzerland. Hence, we also gather monthly retail data for the universe of books traded in Switzerland, from January 2009 to December 2014. Also in this case, for each ISBN code we observe quantity of sales and average retail prices by retail channel, as well as time-invariant characteristics previously discussed.

There are two main differences between the Italian and the Swiss data. First, while in Italy sales quantity and prices are disaggregated into four retail channels, in the Swiss data we have just two channels, namely independent bookstores (denoted as IB) and an aggregate channel including brick-and-mortar chain stores, supermarkets, and e-commerce (denoted as CB+EC). Therefore, to match the retail channels in the two datasets we aggregate prices and quantities in Italy outside the IB retail channel.[16] Second, the three-digit genre categories are slightly different in the two

[16] In particular, we computed aggregate quantities and average prices (weighted by quantity of sales in each retail channel) across e-commerce, vertically integrated bookstores, and supermarket chain stores. We then collapsed the data to obtain a dataset for the Italian market with two retail channels (IB and CB+EC) that is comparable with the Swiss one. In our dataset, IB represents about 35% of sales revenues in Italy, and CB 45%. E-commerce instead

markets. We deal with this issue by generating a classification (Genre IV) that is homogeneous across the two datasets that includes 29 categories. We use this genre classification in both our reduced form and demand analysis.

3.2 Summary statistics

Books are experience goods with highly uncertain demand. They are very heterogeneous on many dimensions. They differ by genre of course, but even within each genre there are very few titles that command large sales and a long tail of books that are published but hardly read. A lot of manuscripts are written, a sizable fraction of these is published, but only very few books enjoy considerable success. The success of a book is in fact largely unpredictable.[17]

From the supply side, for a publisher, publishing a book involves sizable upfront fixed costs, mostly sunk, which are necessary to create the book concept, including the acquisition of property rights, editing, reviewing, and possibly translating. Variable publishing costs instead represent a smaller share and have been declining over time. For a brick-and-mortar bookshop, the technology is relatively simple: a shop and an employee represent the minimum scale to run the business.

On the supply side, the Italian market is not particularly concentrated, neither upstream nor downstream, but there is substantial heterogeneity. Upstream, there are six main publisher groups (Mondadori, Giunti, Feltrinelli, RCS, GeMS, and DeAgostini) and a myriad of small independent publishers (about 5,000). The top 6 publishers roughly constitute 60% of sales over our period.[18] Four of the main publishers (Mondadori, Giunti, Feltrinelli, and GeMS) also own downstream book chains (where, however, books of all publishers can be found).[19] Downstream, as anticipated in the previous section, Italy is characterized by two main sales channels: IB and CB. IB are more numerous in terms of point of sales (3,900 bookshops in 2012), compared to around 700 stores for CB. The former are small, are more diffuse, and employ typically 1 or 2 employees – often the owner of the bookshop. The latter are much bigger, are located in larger cities, and have higher

accounts for 10% of revenues sales, and supermarkets the rest.. In Section 5, where we conduct a structural estimation of demand in the Italian market that does not require the Swiss control group, we show that our results are robust to further disaggregating the retail channels.

[17] Although talking about the success of a movie, Hollywood screenwriter William Goldman famously said "nobody knows anything". The same applies to many cultural products, including songs and books (Waldfogel, 2018).

[18] Notably, a merger between Mondadori and RCS was approved by the Italian Antitrust Authority in 2016, after the period we consider. The transaction led to creation of the largest publishing group in the Italian market.

[19] Independent department stores selling books, like Fnac in France, are not present in Italy.

employment levels as well as sales. Table 1 reports basic summary statistics of our Italian dataset.[20] The average book sells just above 35 copies per month in the period we cover (slightly more in CB+EC, and slightly less in IB). But there is a large heterogeneity, with a few bestsellers selling tens of thousands of copies per month. About one third of the titles are published by one of 6 big publishers (in terms of sales, the share is higher at 60%). IB and CB+EC sell fairly similar types of books: the average cover price is the same between channels, though CB+EC sell a larger variety of titles (73% of titles from CB are also sold by IB, while 90% of titles from IB are sold by CB+EC as well). Their age (time from publication) is similar between channels, as is the share of books published by the big publishers. Instead, the average discount is much larger among CB+EC than among IB (10% vs 1%).[21] Correspondingly, the actual average book price is more expensive in IB than in CB+EC.

About 70% of the book titles sold in Italy are written by Italian authors. This fraction reduces to 63% in terms of sales, as some blockbusters are written by foreign authors. However, even foreign authors are translated in Italian: the share of foreign books written in their original language and not translated in Italian is 2% (1% in terms of sales).

Our first broad cut of the data is by looking at age effects. Each book is different, in a way that has many close, but no perfect substitutes. Although we do not have information on the characteristics that predict success (no one has), books share similar trends over their lifetime. Figure 1 shows the evolution of average unit sales (Panel A) and price discounts (Panel B) in Italy over book (monthly) age. Each diagram reports three series related to the distribution of unit sales and discounts: top 10%, the mean, and bottom 10%. The largest sales happen the first month after publication; demand then declines. Most sales of any book arise in the first two years after publication (Panel A). Reflecting that sales are declining over time, there is a rise in discounts applied by bookshops on the cover price (Panel B), which typically also imply lower retail prices. Books then remain in the market with low volumes for a long time after the initial publication.

[20] Summary statistics for the Swiss dataset can be found in Appendix B.

[21] The discount is computed as Discount = (Cover price – Price)/Cover price. Hence a value of 1 implies the book is given out for free, while -1 means that a book is actually sold at double the cover price (we used -1 as a cut-off point).

TABLE 1: SUMMARY STATISTICS FOR BOOK SALES IN ITALY

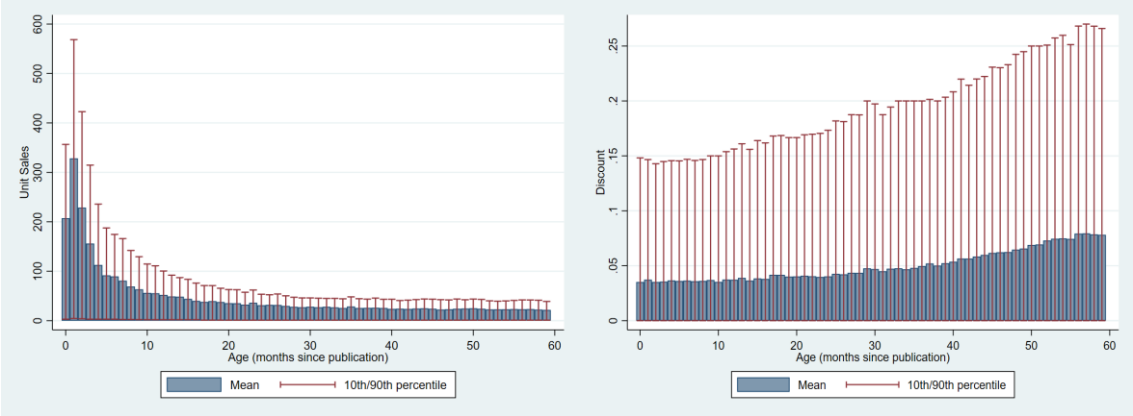
		Mean	Std. Dev.	Min	Max	Obs
All data						
Unit sales		35.722	419.826	1	291,208	15,178,193
Price		15.320	12.472	0.010	500	15,178,193
Cover price		16.520	13.306	0.010	1000	15,178,193
Discount		0.068	0.141	-1	0.999	15,178,193
Age (monthly)		55.957	53.711	0	299	15,178,193
Big publisher		0.331	0.471	0	1	15,178,193
Paperback		0.146	0.353	0	1	15,178,193
Debut works		0.285	0.451	0	1	15,178,193
Italian author		0.695	0.460	0	1	15,178,193
CB+EC						
Unit sales		39.502	504.336	1	291,208	9,829,237
Price		14.882	11.963	0.010	500	9,829,237
Cover price		16.610	13.193	0.010	1000	9,829,237
Discount		0.100	0.149	-1	0.999	9,829,237
Age (monthly)		58.640	54.087	0	299	9,829,237
Big publisher		0.318	0.466	0	1	9,829,237
Paperback		0.131	0.338	0	1	9,829,237
Debut works		0.298	0.458	0	1	9,829,237
Italian author		0.699	0.459	0	1	9,829,237
% of book titles also sold in IB	73%					
IB						
Unit sales		28.776	180.723	1	60,656	5,348,956
Price		16.125	13.318	0.010	500	5,348,956
Cover price		16.354	13.509	0.010	1000	5,348,956
Discount		0.010	0.100	-1	1	5,348,956
Age (monthly)		51.027	52.657	0	299	5,348,956
Big publisher		0.357	0.479	0	1	5,348,956
Paperback		0.173	0.379	0	1	5,348,956
Debut works		0.260	0.439	0	1	5,348,956
Italian author		0.688	0.463	0	1	5,348,956
% of book titles also sold in CB+EC	90%					

Notes: The table reports summary statics of our dataset on book sales in Italy (overall, and by distribution channel). Data are at the ISBN, time (monthly) and channel (independent bookstores denoted as IB and an aggregate channel including brick-and-mortar chain stores, supermarkets, and e-commerce denoted as CB+EC) level.
Source: Authors' calculations based on the GfK POS data.

In our analysis, we will control for ISBN-specific fixed effects, which capture unobservable heterogeneity due to time-invariant characteristics such as author, title, edition, genre, length. We will also account for the age effects on both prices and quantities.

FIGURE 1: EVOLUTION OF SALES AND PRICES BY BOOK AGE

Panel A: Average unit sales by book age Panel B: Prices' percentiles by book age



Notes: The figure shows the mean, 10th and 90th percentiles for unit sales (Panel A) and price (Panel) by book age before the introduction of FBP. Age is measured by the number of months since book publication.
Source: Authors' calculations based on the GfK POS data.

4. Reduced form: empirical methodology and results

Our empirical methodology develops in two steps. In the first step, we identify the causal impact of FBP on price and variety within a quasi-experimental setting in which we compare outcomes between two different geographical markets, Italy and Switzerland, before and after the introduction of the Italian FBP in September 2011. In the second step, we develop a structural model, inspired by the previous findings, with the aim of quantifying the welfare impact of these changes. In the section that follows, we first consider the impact on prices, and then follow with the impact on book variety.

4.1 Impact on prices

There are two sets of prices of interest: the final price paid by customers, and the recommended book cover price set by publishers upstream. The difference between the two is the retail discount set by the bookshops downstream, which is directly subject to FBP regulation.

4.1.1 Impact of FBP regulation on retail prices

We estimate the impact of FBP on final book prices, within a difference-in-differences (DiD) framework in which the Swiss market acts as the control group. There are three main empirical challenges in th is experiment. First, books are very heterogeneous, both in terms of (observable) characteristics and (unobservable) determinants of their success and pricing. We deal with this

issue by controlling for ISBN-specific fixed effects, which capture time-invariant book characteristics. We also account non-parametrically for the age of books by including age-specific fixed effects.

Second, since book demand concentrates on a few successful titles, many books are characterized by a limited amount of sales and/or discontinuity in sales, both in Italy and Switzerland. As a consequence, some books appear and disappear around the regulation without a clear pattern, making the estimation on prices problematic given the ISBN fixed effects. We then select, in the two markets, books characterized by some degree of regularity in sales. In our baseline estimation, we select books with continuous sales in 80% of the cases from their date of publication -- that is books that sell at least one unit for 80% of the months since its publication date. This allows us to generate a panel of comparable books for which we observe prices in both markets before and after the introduction of the FBP regulation.[22] Moreover, we also exploit the presence of books sold in the two markets by restricting the sample to identical book titles sold both in Italy and Switzerland, as well as in both markets and retail channels. This allows us to compare retail price for the same books (identified by ISBN) in treatment and control markets around the introduction of FBP.

Finally, most books in Switzerland are imported from Italy, France, and Germany (and Austria). Hence, their prices depend on the exchange rate (ER) Euro/CHF pass-through. In addition, the price of books published in Switzerland may depend on the ER as well because production inputs may come from other countries. Since there are swings in ER during the time frame of the analysis, we need to account for this. In this context, we follow literature on ER pass-through by including the contemporaneous ER together with 9-month lags of ER (Campa and Goldberg, 2005),[23] all interacted with channel-specific dummies to account for potentially heterogeneous pass-through across retail channels.

In a standard DiD setting, one would like to compare the average residual variation of price in the treated and untreated market around the introduction of the FBP regulation. In principle, this can be done by estimating coefficients associated with market-specific time dummies in a price regression model that controls for the main sources of book heterogeneity, namely book fixed

[22] To ensure that results are not driven by the sample selection, we also run the empirical analysis on different samples of books. See Section 4.2.3 below.
[23] Further increasing the number of lags does not impact the results.

effects, book age, and ER pass-through. However, due to multicollinearity, we cannot identify the ER pass-through and time dummies in the Swiss market in a single equation. For this reason, we employ a two-step procedure in which we first control for time-invariant book and channel characteristics, age effects, and ER pass-through.[24] That is, we estimate the following equation for Switzerland:

$$\log p_{ict} = \alpha_i + \alpha_c + \sum_{j=0}^{9} \rho_{cj} f(logER_{t-j}) + \sum_{k=2}^{48} \theta_k Age_{it}^k + e_{ict}, \quad (1)$$

where p_{ict} is the price of book (ISBN) *i*, in retail channel *c*, and at time (monthly frequency) *t*. α_i and α_c are ISBN and retail channel fixed effects, respectively, while $f(logER_{t-j}) = logER_{t-j} + (logER)_{t-j}^2 + (logER)_{t-j}^3$ allows us to control flexibly for the ER pass-through. We also account for the age Age_{it}^k of each book, up to 48 months after the publishing date.[25] For Italy, we estimate the following equation:

$$\log p_{ict} = \alpha_i + \alpha_c + \sum_{k=2}^{48} \theta_k Age_{it}^k + e_{ict}. \quad (2)$$

We are interested in the residual variation $\hat{e}_{ict}$, which can be interpreted as the price for a book after controlling for age effects, unobservable time-invariant characteristics, and ER pass-through.

To validate our DiD research design, we first plot the normalised average $\hat{e}_{ict}$ for each period and separately for each retail channel and market to check for parallel trends before the introduction of the FBP regulation in the Italian market. Figure 2 shows that the residual price variation is comparable across the two markets before the introduction of FBP regulation in Italy. The post-treatment period exhibits a significant price increase in the Italian IB channel (Panel B) compared to the Swiss market, while in CB+EC prices slightly decrease (Panel A). What is more, there is some anticipation effect: although the regulation entered into force in September 2011, the

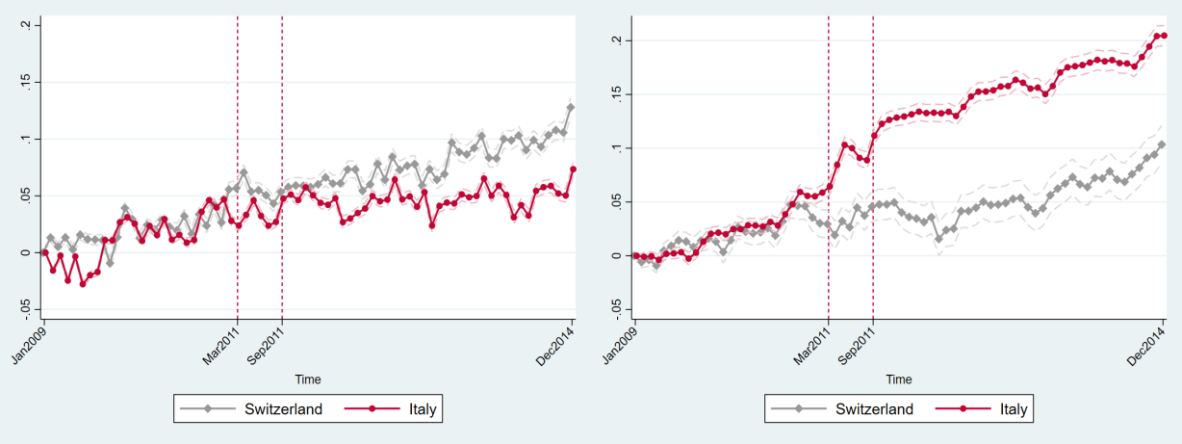
[24] A similar two-step procedure is commonly used in the price dispersion literature, where the outcome of interest is derived from a regression of price on observable characteristics and fixed effects. The resulting residuals provide "clean" prices for the assessment of the degree of price dispersion across markets and/or products. See Lach (2002), Lewis (2008), and Pennerstorfer et al. (2020), among others.

[25] The age dummy associated to 48 is equal to one if book age is greater or equal 48 months, thus capturing an average price variation for books older than 4 years. Recall that most sales happen in the first 24 months.

price effect materializes a few months before, when the regulation was first approved by the upper house (Senate) of the Italian Parliament. [26]

FIGURE 2: EVOLUTION OF BOOK RETAIL PRICES IN ITALY & SWITZERLAND

Panel A: Book prices in chains (CB+EC) Panel B: Book prices in independent (IB)



Notes: The figure shows the average monthly residuals by channel for Italy (red) and Switzerland (grey) standardized to the first period (January 2009), together with the corresponding 95% confidence interval. The sample for estimation includes books selling at least one unit for 80% of the months since its publication date. Standard errors are clustered by ISBN.
Source: Authors' calculations based on the GfK POS data.

We quantify the effect of FBP regulation on retail prices by estimating the following equation:

$$\hat{e}_{imct} = \alpha_t + \alpha_m + \beta_1 Mid_t \times Treated_m + \beta_2 Post_t \times Treated_m + u_{imct}, \quad (3)$$

where $\hat{e}_{imct}$ is the residual price variation for book *i*, in market *m* (Italy or Switzerland), channel *c*, at time *t*. α_t and α_m are time and market fixed effects, respectively. Mid_t identifies the period between the first approval of the FBP regulation (March 2011) and its actual implementation. $Post_t$ is a dummy identifying the post-implementation period starting from September 2011. $Treated_m$ identifies books sold in the Italian market. Finally, u_{imct} is a mean-zero error term. The interaction terms $Mid_t \times Treated_m$ and $Post_t \times Treated_m$ identify the causal impact of FBP announcement and later implementation, respectively.

Table 2 shows the results from our DiD regression. The first column points to a negligible average effect on price induced by FBP. Such a mean null effect hides important heterogeneities across the two channels. Consistent with Figure 2, we observe a relatively small price reduction in

[26] Appendix Tables A2 and A3 provide statistical tests for parallel trends before the approval of FBP. Table A2 focuses on the assessment of linear parallel trends between the two markets, while Table A3 estimates time dummies interacted with the treatment identifier to test for parallel trends non-parametrically.

CB+EC (column 2), counteracted by a sizeable price increase in IB (column 3). Both effects materialize from the approval of the regulation and are increasing in the long run. In columns 4-6, we include ISBN fixed effects to identify causal effects only through books sold both before and after FBP introduction. In this case, we observe a moderate price increase, both in the short (+0.5%) and long run (+1.4%). This average effect comes from two opposing results. Prices rise significantly in the IB channel (+7.8%, column 5), while slightly decrease in the CB+EC retail channel (-0.6%, column 4). An analogous heterogeneity arises when focusing on identical books sold both in the Italian and Swiss markets (see Appendix Table A1), with an average increase of about 5% in the IB channel, while results from the CB+EC channel suggest either again a small negative or a null effect from the introduction of FBP in the long run. It is the differential effect between the two channels that we consider as a rather robust result, as well as the price increase among IB, while for CB+EC the effect is generally very small around zero.

TABLE 2: IMPACT OF FBP REGULATION ON BOOK RETAIL PRICES

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All data	CB+EC	IB	All data	CB+EC	IB
Mid × Treated	-0.003	-0.017***	0.052***	0.005***	-0.009***	0.054***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
Post × Treated	-0.002	-0.029***	0.099***	0.014***	-0.006***	0.078***
	(0.003)	(0.003)	(0.007)	(0.001)	(0.001)	(0.002)
Time FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES
ISBN FE				YES	YES	YES
Observations	8,562,293	6,524,442	2,037,851	8,562,293	6,524,442	2,037,851

Notes: This table presents the effects of FBP on retail prices. The treatment group are the books sold in Italy, whereas the control group are the books sold in Switzerland. The sample used for estimation includes books that sell at least one unit for 80% of the months since its publication date. Columns 1 and 4 analyse the market as a whole, whereas columns 2 and 5 examine chain bookstores and e-commerce, while columns 3 and 6 analyse independent bookstores separately. Columns 4-6 include ISBN fixed effects to identify causal effects through books that were selling units both before and after the introduction of FBP. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

The dynamics of the treatment effects confirm the different price reactions in response to FBP introduction across the channels. Appendix Figure A1 plots estimated coefficients from event study models in which the treatment identifier is interacted with time dummies, separately for the two channels. We observe a clear upward shift in price induced by FBP in the IB channel. The price variation materializes between the approval of the regulation (March 2011) and its entry into

force (September 2011), and survives in the long run. As for CB+EC, we observe a very small negative effect, both in the short and in the long term.

A further look at the prices reveals interesting patterns (see Appendix Figure A2 for the plots). Generally, we witness a phenomenon of "price and discount convergence".[27] Before the regulation, there was a considerable heterogeneity in discounts and retail prices among books. The mean difference between the most discounted and the least discounted books was above 20% of the cover price in both channels. After the regulation, towards the end of our period, this difference shrinks to less than 10%. Among IB, the discount post FBP converges around zero on average. Among CB, it converges to a higher level (10% on average), but still below the direct cap of the regulation (15%). This pattern in discounts has an almost exact counterpart on the pattern of retail prices. Hence the regulation hit the retail price of most books, even those that – in principle – were not subject to the direct cap.

In sum, there is robust evidence that FBP affected the discounts and prices not only of the heavily discounted books that were directly covered by the regulation, but also of almost every other book. The intensity of price competition was greatly reduced especially among IB, the heterogeneity of discounts compressed, and the industry converged on narrower set of focal discounts.

4.1.2 Impact of FBP regulation on cover prices

The previous results look at the impact on the final retail price, and the inclusion of ISBN fixed effects exploits books that were sold both before and after the introduction of FBP. A related and relevant question is whether FBP affects prices also at the upstream level, as set by the publishers. Is there a significant change in recommended cover prices, after the regulation? Notably, cover price is a time-invariant feature of each book, as identified by its ISBN. Hence, it is fixed during the book lifetime. If the publisher wants to change the cover price of a book title, then a new edition of the book must be issued, with an associated new ISBN. Therefore, to analyse the impact of FBP on cover price, we have to perform a slightly different experiment compared to the one conducted on retail prices. In this case, we observe different cohorts of books, each referring to a particular

[27] The phenomenon of convergence is also found by Biscour et al. (2013) in the context of French supermarkets when a regulation ("Loi Galland") banned products from being sold below cost.

date of publication. Then, we compare the evolution of books' cover price published before and after the regulation, between treatment and control groups.[28]

We estimate two different DiD models. In the first one, we compare the cover price of books published in Italy and Switzerland, around the introduction of FBP. As many books in the Swiss market are published by foreign publishers (mostly German and French), the comparison group includes only books published by Swiss publishers. Moreover, to avoid potential spillover effects between the two markets, we exclude Swiss-Italian publishers. This is because their reference market may include also Italy, hence their decisions may be affected by FBP as well. As a result, the control group includes French and German Swiss publishers.[29] In the second DiD model, we restrict the attention to the Italian market, comparing the evolution of cover prices between large and small publishers. We run this analysis because one of the intended effects of the Levi Law is to promote small publishers.

TABLE 3: IMPACT OF FBP REGULATION ON BOOK COVER PRICES

	(1)	(2)	(3)	(4)	(5)
Sample	ITALY & SWITZERLAND			ITALY	
Mid × Treated	-0.011	-0.029	-0.008	-0.006	0.001
	(0.035)	(0.026)	(0.016)	(0.021)	(0.019)
Post × Treated	-0.020	-0.030*	-0.021	-0.007	0.003
	(0.024)	(0.018)	(0.015)	(0.022)	(0.019)
Date of publication FE	YES	YES	YES	YES	YES
Market FE	YES	YES	YES		
Genre IV FE		YES	YES		YES
Publisher FE			YES	YES	YES
Observations	216,509	216,509	216,509	198,146	198,146

Notes: This table presents the effects FBP on cover price. The dependent variable is the logarithm of book cover price. In columns 1-3 the treatment group are all the books published in Italy, whereas the control group are all the books published in Switzerland by German or French Swiss publishers. In the last two columns the treatment group are the books published by large publishers in Italy, whereas the control group are the books published by small publishers in Italy. Standard errors clustered by publisher in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data on a two-year window around the regulation.

[28] Swiss data show an unusual upward spike in cover price at the very end of our panel (December 2014) which falsify the comparison with the Italian market. For this reason, to perform this empirical exercise we restrict our attention to a two-year window around the regulation.

[29] In Switzerland, there exists an association of Swiss publishers for each of the three official languages of the country. ALESI is the association of Italian Swiss publishers, while SBVV and LIVRESUISSE are the German and French counterparts. We then identified publishers for each language from the list provided by each association.

A simple comparison between treatment and control groups around the introduction of FBP shows that there is no significant variation in the average cover price not only between Italy and Switzerland, but also between large and small publishers within the Italian market (see Appendix Figure A3 for the evolution of cover prices). This evidence is confirmed by DiD estimates in Table 3 which show no significant variation in cover price following the introduction of FBP in Italy. This holds true both when we compare Italy with Switzerland (column 3) and when we compare, inside Italy alone, big and small publishers (column 5).[30]

4.2 Impact on book varieties

We now analyze the impact of the law on book variety, distinguishing again between the upstream (publisher) and downstream (bookshop) level.

4.2.1 Impact of FBP regulation on book variety published upstream

One rationale mentioned by those who advocate FBP is its impact to promote book variety. We run an analysis similar to cover prices to assess whether the FBP regulation affected publishers' incentives to issue more book titles. Publishers receive a lot of manuscripts for review, and eventually decide to publish only a few of them. Did this choice change with the Levi Law?[31]

For each date of publication (monthly), we count the number of ISBNs published in Italy and Switzerland, as well as for large and small publishers within the Italian market. Then, we compare the number of books published in the treatment and control groups before and after the introduction of the FBP regulation. Results are collected in Table 4. As shown by columns 1 and 4 (and corresponding Appendix Figures A5 and A6), we do not find any significant effect on the number of new books published in either specification.

However, one main objective of the regulation is to promote Italian culture more specifically. That is, the higher margins from FBP may be used to cross-subsidize books written by Italian

[30] Formal tests for parallel trends are collected in Appendix Tables A5 and A6. Table A5 shows no difference in the (linear) trends of cover prices before FBP between treatment and control group. Table A6 provides a non-parametric test showing interaction coefficients that are generally not statistically significant in the pre-FBP period. Finally, Appendix Figure A4 displays the dynamics of the treatment effect on cover prices. It shows no difference between treatment and control groups both before and after FBP, thus validating the research design as well as the null effect on cover prices.

[31] It takes about 6-9 months to review a manuscript and bring it on the market, and times can be considerably shorter for writers represented by literary agents. We do not consider instead the long run impact the Law might have had on authors' incentives to write more manuscripts.

authors, rather than translating foreign authors. To test this hypothesis, we first identify Italian authors in the Italian market.[32] Then, we count the number of books published by either Italian or foreign authors and we run again our DiD estimations. We find no significant difference between the number of Italian-authored books published in Italy compared to foreign authors when we use Switzerland as a control group (columns 2-3). Nor we find any difference between big and small publishers in the number of titles published by Italian or by foreign authors (columns 5-6).

Since we do not observe any variation in the number of books published around the regulation, we conclude that FBP had no material impact on the upstream publication decision of publishers.

TABLE 4: IMPACT OF FBP REGULATION ON BOOK VARIETY

	(1)	(2)	(3)	(4)	(5)	(6)
	ITALY & SWITZERLAND			ITALY		
Sample	All authors	Italian	Foreign	All authors	Italian	Foreign
Mid × Treated	-0.091	-0.095	-0.045	0.121	0.108	0.133
	(0.263)	(0.267)	(0.245)	(0.203)	(0.198)	(0.206)
Post × Treated	0.084	0.075	0.120	0.023	-0.011	0.071
	(0.220)	(0.231)	(0.172)	(0.212)	(0.206)	(0.211)
Date of publication FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES			
Big publisher FE				YES	YES	YES
Observations	144	144	144	144	144	144

Notes: The table presents the effects of FBP on the total number of books published. The dependent variable is the log-number of books published in each month. In columns 1-3 the treatment group are the books published in Italy, whereas the control group are all the books published in Switzerland by German or French Swiss publishers. In columns 4-6 the treatment group are the books published by large publishers in Italy, whereas the control group are the books published by small publishers in Italy. Columns 2 and 4 restrict the treatment group to books published in Italy by Italian authors, while in columns 3 and 6 the treatment group is the number of books published by foreign authors. Standard errors robust to heteroskedasticity in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

4.2.2 Impact of FBP regulation on book variety sold downstream

Our results so far indicate that FBP does not affect publishers' behaviour, both in terms of books published and cover price. In particular, FBP regulation does not lead to an increase variety in terms of new book titles brought to the market. Nonetheless, the intention of the regulation is also to foster the diffusion of book titles through a widespread network of brick-and-mortar bookstores. In other words, FBP may affect the variety of book titles actually *sold* in the marketplace by

[32] In Appendix C we explain how we identified Italian authors.

allowing brick-and-mortar bookstores to profitably operate in the market and/or by affecting the incentives to provide more tailored services to customers.

We investigate this issue by analyzing the change in title sales concentration in Italy and Switzerland around the introduction of FBP. We start by simply comparing the number of books (ISBNs) sold at each point in time across retail channels and geographical markets around the introduction of the Italian FBP regulation. Appendix Figure A7 plots the monthly total number of book titles sold in the Italian and Swiss markets by distribution channel. We observe a sharp increase in the number of book titles sold in Italy *vis à vis* Switzerland, particularly in the IB retail channel. The variation is significant: the DiD estimates of Table 5 suggest an average increase of about 25.5% (column 2), driven largely by a rise in the IB channel (37.9%; column 4). Moreover, the timing of the variation relates closely to what we observed for retail price, with an anticipation effect when the regulation was approved (March 2011) but not yet implemented (September 2011).

TABLE 5: IMPACT OF FBP REGULATION ON BOOK VARIETY SOLD

	(1)	(2)	(3)	(4)
Sample	All data	All data	CB+EC	IB
Mid × Treated	0.208	0.208***	0.102***	0.314***
	(0.221)	(0.070)	(0.037)	(0.072)
Post × Treated	0.255**	0.255***	0.132***	0.379***
	(0.125)	(0.033)	(0.017)	(0.026)
Time FE	YES	YES	YES	YES
Market FE	YES	YES	YES	YES
Channel FE		YES		
Observations	288	288	144	144

Notes: This table presents the effects of FBP on the variety of books sold. The dependent variable is the log-number of book titles sold in each market (Italy or Switzerland) and channel (CB+EC or IB) every month between 2009 and 2014. The treatment group are the books published in Italy, whereas the control group are the books published in Switzerland. Standard errors robust to heteroskedasticity in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

A similar result is obtained when looking at variety concentration indexes. Appendix Table A7 shows DiD results when the dependent variable is the market share of the top 100 book titles (C100) in the two markets in each distribution channel, as well as when the dependent variable is the Herfindahl–Hirschman Index (HHI). Consistently, we observe a reduction in sales concentration, mostly driven by the IB channel.

The reduction in concentration driven by the IB channel suggests a redistribution of sales towards a larger number of book titles, also compared to the CB+EC channel. However, it is unclear which types of books benefit in terms of increased sales in IB after FBP. To shed some light on this issue, we compute market shares of (i) paperback books, (ii) books written by Italian authors, (iii) books issued by a big publisher, (iv) recent titles (i.e., books within 1 year since publication date), and (v) debut works, both over time and across the two distribution channels. We then estimate the variation of market shares in IB compared to CB+EC, before and after the introduction of FBP, to grasp the distributional effects of the regulation in the IB channel. Across those book categories, we observe a reduction in the market share of recent books, and especially in the share of books issued by big publishers (Appendix Figure A8). As book sales are typically concentrated within the very first months since publication, and big publishers represent a large share of the market, the evidence suggests a change in the composition of sales in the IB channel towards less traditionally popular books. The regulation seems to favor books that usually have low sales (like those from small publishers and those books that are relatively old), while best sellers are bought relatively less.

4.2.3 Further results and robustness

In this section we first provide some additional information about the impact of FBP regulation in the Italian market. We then conduct some heterogeneity analysis. Finally, we consider some robustness checks of the main price results.

First, we look at the impact of regulation on quantities. Using a DiD approach, we consider the impact of FBP on aggregate quantities. Results in Appendix Table A8 and Figure A9 suggest that the number of books sold in Italy decreased by 8.6% in Italy post reform, compared to the Swiss control. This reduction in sales, however, is not led by the IB channel (who became relatively more expensive), rather by CB+EC. There may be different reason for this apparent discrepancy. One reason is that there could be substitution across channels, especially in case of a differential effect on service effort. If IB exert more effort than CB+EC, there will be an increase of demand for the former that can compensate for the reduction in demand due to their higher price. We attempt to study this with a structural model in Section 5. Another reason is that the average price reduction that we detected for CB+EC channel (Table 2) is a simple mean across ISBN, unweighted by sales. Hence, we look next at the heterogeneous impact on prices of different books across channels.

We consider the differential effect on paperback vs hardcover books, Italian vs foreign authors, small vs big publishers, debut works vs the rest, and recently published books vs the rest. We study these differences across channels. Results are shown in Appendix Table A9 and Appendix Figure A10. In general, we observe that our main finding of prices increasing in IB and either slightly decreasing or not changing much in CB+EC is extremely robust across all these categories.[33] As for heterogenous effects, paperbacks became relatively more expensive than hardcover books (suggesting that intertemporal price discrimination became more muted post reform), and small publishers became relatively cheaper compared to big publishers. As for the other dimensions (Italian vs foreign authors, debut works vs the rest, and recently published vs older books), given our large sample size we do detect some differences but they are all very small in size.

Finally, we conclude this section by turning to the robustness of our main finding on book prices in Table 2. Results in Table 2 derive from having selected books with continuous sales in 80% of the cases from the date of publications. We consider alternative selection criteria. Notably, we select (i) books with a sufficient amount of sales throughout the book lifetime (similar to Ashenfelter et al., 2013), (ii) books with continuous sales within a one-year window around the regulation, and (iii) books with continuous sales from the date of publication. Results from all these different selections are comparable with the baseline and are presented in Appendix Table A4. In all cases, we observe a clear price increase driven by IB. Moreover, we also detect a small negative effect in the CB+EC channel.

5. Demand estimation

A few facts emerge from the reduced-form evidence presented in the previous section. Publishers upstream are largely unaffected by FBP, irrespective of their size. Book cover prices do not change, and publishers do not alter the number of titles they publish in their catalogues. Instead, the Law has several effects among book sellers downstream. This is to some extent expected as the law itself was directed at affecting the margins made downstream, by capping the maximum discounts that retailers could offer.[34]

[33] The only exception is the price of paperbacks that increased everywhere, also in CB+EC. Since this channel sells large volumes of paperbacks, this could be one reason for the observed reduction in total sales in CB+EC post reform.
[34] However, note that since we do not observe wholesale contracts between publishers and bookshops, we are not in a position to comment on which side has benefited the most and how relative incentives changed as a reaction to FBP.

We also found that downstream effects are heterogenous. In particular, IB stores react by reducing their discounts (and hence the final price to readers increase), but they sell a wider variety of titles post regulation. There seems to be a re-direction of demand towards books that also existed before the change in regulation, but were not getting the same attention from the readers. Instead, the reaction from CB+EC is more muted. They slightly increase their average discount, while the variety of books sold remains unchanged.

Post reform, IB seem to exert more "effort" relative to the other distribution channels, in a way that could directly affect the utility of consumers and prompt them into buying a larger variety of books. This is in line with the "service effort" argument that has a long history in the economics of FBP and RPM more generally, since at least the work of Telser (1960) who argued that RPM promotes retail services. Without RPM, consumers may "free ride" by getting premium services and advice in high-quality stores but then purchasing from discount stores. Eventually, this leads to a bad equilibrium where stores have a disincentive to put any effort in providing valuable services. With RPM instead, the focus of competition shits from price to service effort. In the case of books, this increased effort can take practically many forms: from cultural events in store, to increased individual customer care, to promotion of specific authors or books, to local advertising, etc. In all these cases, the result is that a wider variety of books is ultimately bought by readers. While we cannot observe effort directly, in Section 6 we will return to the discussion of this mechanism.

The lower impact on book variety sold by CB compared to IB is probably expected because CB are vertically integrated with a main publisher, and hence are less affected by FBP which tries to regulate the wholesale margin (though this internalization is not complete, as CB also sell books from other publishers).

With these facts in mind, we now propose a demand model that is then utilized to analyze the welfare impact on readers of the introduction of FBP regulation across distribution channels.

5.1 Structural model

Consumers in this market can choose a book among a large number of differentiated products. To model the substitution patterns, we specify a standard discrete choice model as applied on aggregate market-level data (McFadden, 1981; Berry, 1994; Berry et al., 1995; Verboven, 1996), and we add a twist.

We begin by assuming that the utility of consumer *i*, for book *j*, in channel *c*, at time *t* is

$$u_{ijct} = \underbrace{X'_{jct}\beta - \alpha p_{jct} + \xi_{jct}}_{\delta_{jct}} + (1-\sigma)\epsilon_{ijct}, \quad (4)$$

where X'_{jct} is a *K*-dimensional vector of the observed product characteristics, p_{jct} is the retail price, ξ_{jc} stands for the unobserved by the econometrician product quality of book *j* in channel *c* and ϵ_{ijct} is a mean-zero idiosyncratic taste stochastic term.

To model the impact of FBP regulation, we expand the mean utility, δ_{jct}, by adding the following terms: $\gamma_1 Post_t \times IB_{jc} + \gamma_2 IB_{jc} + \gamma_3 Post_t$, where $Post_t$ is an indicator variable that takes the value of one after the implementation of regulation and IB_{jc} is an indicator variable for the independent bookstore channel. The interaction term captures the idea that, following the FBP regulation and the subsequent reduction in price competition, IB put more effort and services relative to the other channels. This leads customers to purchase a wider variety of books. These services are expected to increase the mean utility of books, but of course the critical question is the empirical magnitude of this effect.

As standard in this literature, assuming that ϵ_{ijct} is identically and independently distributed across products and consumers according to the "type I extreme value" distribution, then the market share of product *j* is given by

$$s_{jct}(\delta) = \frac{e^{\delta_j/(1-\sigma)}}{I_g} \frac{{I_g}^{1-\sigma}}{\sum_g ({I_g}^{1-\sigma})}, \quad (5)$$

where: $I_g = \sum_{j \in g} e^{\delta_j/(1-\sigma)}$. Since the utility of the outside good is zero, then δ_0 and I_0 are equal to zero and one respectively. We assume that the potential market size, *M*, is the whole adult population in Italy, and hence the market shares can be calculated as $s_{jct} = q_{jct}/M_t$ and $s_{0ct} = (M_t - \sum q_k)/M_t$.

We consider several different possibilities for the nesting parameter, σ. First, we assume that each book is a separate nest, reflecting the perception that every book is slightly differentiated even among books of the same genre. Reimers and Waldfogel (2021) utilize a similar model in their demand calibration exercise for the US book market. Second, we assume that books belonging to the same genre are closer substitutes. We test this possibility using three different aggregation level of genres, from the most general one (genre I, four different categories) to genre

II (25 categories), and genre IV (29 categories). Third, we also test whether consumers first select the distribution channel before selecting a particular book.[35]

Identification of the coefficients on price and within group market shares is based on a vector of instrumental variables. Interestingly, the typical Berry et al. (1995) aggregate level instruments of the number of own and rival books for each publisher (and/or genre) are ineffective empirically in this market for the simple reason that there are "too many" products available at each point in time. Instead, we borrow the approach of Reimers and Waldfogel (2021) and compute the number of books that were originally released in the past month, in the past two months, and so on, up to six months. These instruments capture the notion that, for the vast majority of books, most of their sales take place early in their lifecycle and they are more strongly affected by the number of other books available in their cohort, rather than the number of books available in general in the market.

5.2 Results

Table 6 summarizes the results from estimating the simple Logit and the Nested Logit demand models using different nests. All regressions include year (5), month (12) and genre (29) fixed effects. Standard errors are clustered at the book ISBN level to control for autocorrelation and heteroskedasticity. Columns 1 and 2 estimate the Logit model without and with the instruments. The price coefficient increases substantially after instrumenting, resulting in elastic demand for most books, while the first stage F-test is high and strongly significant in column 2, indicating that the instruments are correcting for the price endogeneity. The rest of the coefficients have the expected signs, with age having a negative coefficient and large publishers a positive one. The interaction of the indicator for independent bookstores with the post dummy is positive and significant, highlighting a positive utility effect of this channel after the reform.

Column 3 estimates a Nested Logit model based on a nest for each book. The nesting parameter, σ, is above one indicating high substitutability among books or, otherwise, rejecting the hypothesis that each book can be considered a distinct product. Hence, this specification does not make much sense economically. Column 4 examines the case of consumers first selecting the channel from which they are going to buy, before selecting their books. Results indicate that there is limited

[35] We also estimated a two nests nested logit, combining these nests in every ordering, but empirical results rejected these models.

substitutability (σ = 0.384) between distribution channels, while the rest of the coefficients have similar signs and significance to those in column 2.

TABLE 6: DEMAND ESTIMATION RESULTS

	(1)	(2)	(3)	(4)	(5)
Model	OLS Logit	IV Logit	NL book	NL channel	NL Genre IV
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.009***	-1.432***	-1.348***	-0.631***	-0.586***
	(0.000)	(0.061)	(0.060)	(0.043)	(0.040)
Group segment parameter (σ_g)			1.383***	0.388***	0.426***
			(0.321)	(0.014)	(0.013)
Book age	-0.017***	-0.038***	-0.040***	-0.020***	-0.018***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Paperback edition	3.352***	-6.681***	-6.198***	-2.359***	-2.169***
	(0.026)	(0.439)	(0.429)	(0.273)	(0.253)
Big publisher	2.476***	3.278***	3.710***	1.868***	1.748***
	(0.015)	(0.094)	(0.139)	(0.066)	(0.062)
Post × IB indicator	0.216***	1.000***	1.067***	0.429***	0.445***
	(0.005)	(0.043)	(0.048)	(0.030)	(0.027)
Post	0.054***	-0.210***	-0.256***	-0.089***	-0.102***
	(0.006)	(0.021)	(0.024)	(0.011)	(0.010)
IB channel indicator	-1.362***	0.510***	3.321***	-0.356***	-0.019
	(0.005)	(0.087)	(0.678)	(0.054)	(0.043)
Observations	29,053,247	29,053,247	29,053,247	29,053,247	29,053,247
Clusters (ISBN)	522,017	522,017	522,017	522,017	522,017
Instruments		Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months
First stage F-test (price)		226.5	117.36	114.43	113.31
p-value		[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)			30.19	200.09	203.38
p-value			[0.000]	[0.000]	[0.000]
Number of books with inelastic demand	99.55%	0.03%	67.62%	0.05%	0.05%

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.
Source: Authors' calculations based on the GfK POS data.

In the final column 5 we assume that consumers first choose the book genre and then a book within that genre. The coefficient on the nesting parameter is 0.426, indicating some limited substitutability across genres.[36] Average own price elasticity is high.[37] The interaction term of the

[36] Results are consistently robust if we aggregate at different genre levels (genre I with four different categories, or genre II with 25 categories).
[37]The average own price elasticity is estimated between -15 and -18. Estimates in the literature vary widely from inelastic (Reimers and Waldfogel, 2017, 2021) to -3 (Bittlingmayer, 1992). The high value of our estimated elasticities is to be expected because we have high frequency data on the universe of books sold in Italy and our unit of observation is at the ISBN and channel level. Our baseline assumption is that the potential yearly market is the whole population

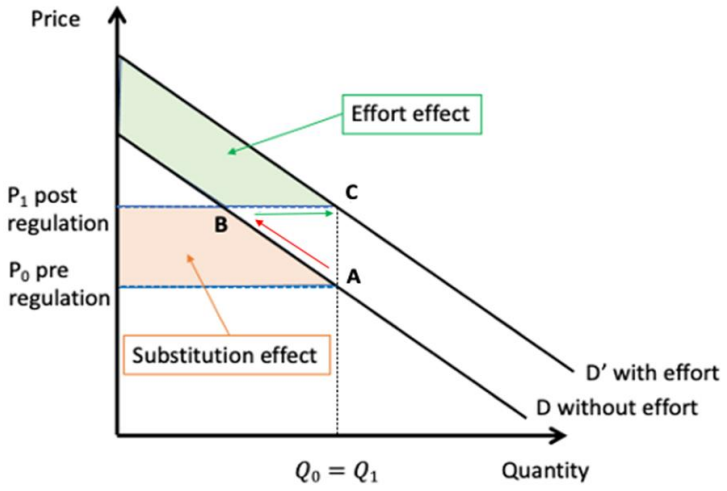
independent bookstores with the post indicator, although half in magnitude compared to column 2, is positive and significant.

5.3 Welfare analysis

Based on the estimated demand model, we proceed now to calculate the welfare impact of the FBP regulation. Figure 3 visually depicts the overall effect (going from point A to point C) split down into two opposing effects.

Imagine, pre-reform, the market for books is in equilibrium at point A. On the one hand, as we documented in Section 4, the introduction of FBP regulation meant a reduction in discount competition which resulted in higher prices for readers. We call this the "substitution effect" as the price increased from P_0 to P_1 and readers suffer from the price change as well as substitute away from books since they became more expensive. This is illustrated in Figure 3 as a movement from point A to point B. Absent the regulation, prices would have been lower along the pre-regulation demand curve. We use the estimated demand coefficients of Table 6 for the period prior to FBP regulation, and we change prices, differently for two channels, based on the DiD estimates of Section 4.1.1 (Table 2). The loss in consumer welfare due to the regulation corresponds to the red-shaded area.

FIGURE 3: GRAPHICAL REPRESENTATION OF WELFARE COUNTERFACTUALS



of Italy. Altering any of these data characteristics and assumptions reduces the value of estimated elasticities (Goeree, 2008).

Notes: The figure visually depicts the "substitution effect" (in red) as a movement from point A to point B due to the introduction of FBP regulation which resulted in higher prices and the "effort effect" (in green) as a movement from point B to point C due to the higher effort exerted post regulation from the independent bookstores. The figure extends Figure 1 in Telser (1960).

On the other hand, we argued that IB seem to exert more effort post regulation resulting in higher utility. In our demand model, the interaction term between independent bookstores and the post indicator is positive and significant, pushing the demand curve out (from point B to point C), at given prices, as indicated by the green area in Figure 3. We call this the "effort effect" and we calculate its welfare magnitude as the difference between the demand with and without effort (by switching off the interaction coefficient). The gain in consumer welfare due to regulation corresponds to the green-shaded area.

The final effect on consumer welfare is the difference between the green and red areas. In principle, the net effect can go either way. Notice that simply comparing the quantity purchased before (Q_0) and after (Q_1) the regulation could not tell the net change in consumer welfare. In Figure 3, for instance, we draw a case where the overall quantity does not change ($Q_0 = Q_1$) while the welfare change can be either positive or negative, depending on the relative size of the two shaded areas.

We compute the variation in consumer welfare using the results of Small and Rosen (1981). Omitting the constant for simplicity, consumer welfare in the nested logit model is given by[38]

$$CS = \frac{M}{\alpha} \ln \left(\sum_g \left(\sum_{j \in g} exp\left(\frac{\delta_j}{1-\sigma} \right) \right)^{(1-\sigma)} \right). \quad (6)$$

Table 7 summarizes the results for the models estimated in Table 6 (columns 2, 4 and 5). For all models, the negative impact of the substitution effect due to the price increases[39] is counterbalanced by the larger increase in demand[40] due to the effort effect such that the net welfare impact is positive (ranging from 68 to 192 million euros). In other words, despite the fact the FBP regulation increased prices due to a reduction in discount competition, it possibly led to significant competition in services that increased the consumers' utility. In the case of the simple logit the

[38] Consumer welfare from the Logit model can be derived by setting $\sigma = 0$.
[39] We used the estimated heterogeneous causal effect on prices from Table 2: column 4 for the CB+EC retail channel (-0.6%) and column 5 for the IB channel (+7.8%).
[40] The coefficient on $Post \times IB$ from Table 6 depending on the model.

welfare calculations indicate that the consumer surplus was increased by 4%, whereas for the nested logit models the overall increase was in the range 1.2-1.5%.

TABLE 7: OVERALL WELFARE CALCULATIONS (in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
Logit (IV)	Substitution effect only	2,310	2,362	-52	-2.3%
	Effort effect only	2,554	2,310	245	9.6%
	Total welfare effect	4,864	4,671	192	4.0%
Nested Logit (channel)	Substitution effect only	2,223	2,263	-40	-1.8%
	Effort effect only	2,331	2,223	108	4.6%
	Total welfare effect	4,555	4,487	68	1.5%
Nested Logit (Genre IV)	Substitution effect only	3,158	3,197	-39	-1.2%
	Effort effect only	3,274	3,158	116	3.5%
	Total welfare effect	6,432	6,355	77	1.2%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discussed in section 5.3 of the paper. The different rows correspond to columns 2, 4 and 5 of Table 6.
Source: Authors' calculations based on the GfK POS data and the estimated results from Table 6.

In Table 8 we use as our benchmark model the Nested Logit based on genre IV (Table 6, column 5) and we break down the welfare calculations by distribution channel. The top panel shows that, for independent bookstores only, although the negative substitution effect from the price increase was the largest (-9.7%), the countervailing increase in utility was also very strong (15.7%) leading again to a net positive consumer surplus. In contrast, for the chain bookstores distribution channel, there is a slight decrease in prices due to regulation that increases the consumer surplus. Moreover, since there we assumed no effort effect for this channel, this is also the overall effect of the introduction of regulation. See the bottom panel of Table 8 for the results.

TABLE 8: WELFARE CALCULATIONS BY CHANNEL (in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
IB BOOKSTORES ONLY	Substitution effect only	2,124	2,330	-206	-9.7%
	Effort effect only	2,520	2,124	396	15.7%
	Total welfare effect	4,645	4,454	191	4.1%
CB+EC BOOKSTORES ONLY	Substitution effect only	2,989	2,973	16	0.5%
	Effort effect only				
	Total welfare effect	2,989	2,973	16	0.5%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios for the independent bookstores (top panel) and the chain bookstores, supermarkets and e-commerce (bottom panel) based on the estimates of column 5, Table 6. We use the same estimated coefficients for both channels, but sum over the books sold in each channel separately.
Source: Authors' calculations based on the GfK POS data for the universe of books traded in Italy from January 2009 to December 2014 and the estimated results from Table 6.

These findings highlight the significant heterogeneity across distributional channels, and also emphasize that the positive net welfare impact is observed for each channel independently as well.

5.4 Robustness

In this section we perform a number of alternative estimations to gauge the robustness of our previous results.

As an initial step, we check the robustness of our instruments in the demand estimation. In our main specification (Table 6) we use the number of books that were released in recent months. We also used a variation on these, where we measure the number of books released in the past month(s) that are in the top 100 in sales across Italy. The idea here is to capture the intensity of competition among successful new book releases, instead of just new releases in general. The higher the number of successful new books released, the harder would be for a new book to get shelf space in the bookstore, to be reviewed, to hold an event with the author, and so forth. Results are reported in Appendix Table D1 and show very similar patterns to Table 6. The instruments significantly move the price coefficient (column 2), while the Nested Logit specification based on each book (column 3) is again rejected. The last two columns that are based on the channel or on nests for each genre provide the most sensible results, both in terms of the nesting coefficient and the positive and significant interaction of IB with the post regulation indicator.

We next turn to the robustness of our welfare results. In all these experiments we use as our benchmark the Nested Logit based on genre IV (Table 6, column 5). The idea of these robustness

exercises is to demonstrate that no particular genre or type of book drives these results, so if we truncate randomly the data the conclusions remain unchanged.

First, we randomly truncate the data by dropping books whose last ISBN digit is even, one by one. Appendix Table D3 reports the welfare calculations (see also Appendix Table D2 for the demand estimation results). No significant differences are observed.

Second, we randomly drop different genres from the genre IV categorization. Appendix Table D5 shows that the welfare calculations remain unchanged also in this case (see Appendix Table D4 for the corresponding demand estimation results).

Third, we examine more carefully the issue of books not reporting any sales at all in a given month. Given that we track every book sold in Italy, many of these books are not sold at all in many periods. On aggregate, almost two thirds of the observations report zero sales, while this number is decreasing over time. Following the literature (see, for example, Reimers 2019), in all previous specifications we add a small constant (0.0001 units) to each book's monthly unit sales. While this is necessary given the logit structure of the demand model, the constant selection is arbitrary. Hence, we re-estimate our benchmark demand model adding different constants (from 0.00001 to 1, see Table D6 for the demand estimation results). As we can see from Table Appendix Table D7, adding a larger constant affects the level of welfare overall, the qualitative results of the welfare calculations do not depend on the constant added.

In addition, we address the books reporting zero sales using the bounds approach by Gandhi et al. (2023). The innovation of their paper is to use moment inequalities to control for the zeros, while using the variation in the remaining data to estimate demand. They show how to construct upper and lower bounds for the conditional expectation of the inverse demand. These bounds are used to construct moment inequalities, which are valid in the presence of zeros. As the authors demonstrate, this estimator works well even when the fraction of zeros is 95%. Their point estimator is explicitly created for aggregate market level data and it is consistent so long as the number of consumers in the market in question is large. Both these features match our working environment and their estimator is particularly suited given that our potential market is the whole of Italy. We estimate two versions of their model, one for Logit and one for our benchmark Nested Logit (Appendix Table D8 contains the corresponding demand estimation results). Table 9 reports the welfare calculations based on these estimates. Results remain qualitatively unchanged.

TABLE 9: ROBUSTNESS OF WELFARE CALCULATIONS (BOUNDS APPROACH, in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
IV Logit (bounds approach)	Substitution effect only	9,499	9,529	-30	-0.3%
	Effort effect only	9,587	9,499	88	0.9%
	Total welfare effect	19,086	19,028	58	0.3%
IV Nested Logit Genre IV level (bounds approach)	Substitution effect only	1,180	1,207	-27	-2.3%
	Effort effect only	1,249	1,180	69	5.5%
	Total welfare effect	2,428	2,387	42	1.7%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discusses in section 5.3 of the paper. The different rows correspond to columns 1 and 2 of Table D8.
Source: Authors' calculations based on the GfK POS data and the estimated results from Table D8.

The next robustness exercise relates to the interaction term of the independent bookstores with the post indicator. In our benchmark model in Table 6 we bundled together all the other channels, except for the independent bookstores, so that the data matched the equivalent one from Switzerland that we had used earlier in the reduced-form approach. Since Swiss data are not needed for the structural estimation, we now re-run our demand estimates, by unbundling the chain bookstores from the rest (supermarkets and e-commerce). Both these channels are not customer facing and hence they are not organised to provide or compete in customer services. We would expect a zero "effort effect" for supermarkets and e-commerce. Instead, there could be some effect not only for IB but also for CB. Hence we run a more flexible specification where we further expand the mean utility, δ_{jct}, by adding both the interaction $\gamma_1 Post_t \times IB_{jc}$ (as before) and a new term $\gamma_3 Post_t \times CB_{jc}$. As we can see from Table 10, the coefficient on the interaction of IB with the post indicator is always positive and significantly larger than the one on CB. Therefore, even if chain bookstores also respond to the change in regulation and provide some additional services, their level seem to be significantly smaller than that supplied by independent bookstores. We do not conduct a welfare assessment of FBP because, strictly speaking, we do not have a price change due to the regulation for the CB channel alone. But we conjecture that welfare results would be rather similar to our main specification, or possibly even further reinforced since now we do have a positive effort effect for the CB as well.

Appendix Table D9 reports the estimated demand results for a number of alternative specifications and Appendix Table D10 reports the welfare calculations for selected columns. Columns 1 and 2 reduce the potential market size by 10% and 20% respectively. Welfare results remain fairly similar to the baseline specification. In column 3 we experiment with a more flexible

specification by adding a triple interaction with the largest publishers in Italy. In line with the earlier reduced form results, we find that the largest publishers experience a reduction in their market shares post regulation in the IB channel, but this has a minimum impact on the welfare calculations.

Given that IB stores tend to be smaller than CB stores, one might wonder whether the variety of books on offer is the same across these two channels. In addition, recent work (Argentesi, et al., 2021; Ozhegova, 2023) has demonstrated that, particularly when prices are fixed, firms may use product variety strategically. Given the aggregate nature of our data we cannot examine whether the books on offer or the book display vary across individual stores. To alleviate this concern, we can however run two experiments. First, we focus attention on new publications, under the reasonable assumption that all stores would carry and display those new books. In column 4 we estimate our demand model restricting the sample to new books only (during their first year of publication). The interaction term of IB with the post indicator remains positive and significant and the welfare measures (Appendix Table D10) are qualitatively similar to our baseline specification. Second, we restrict our sample to the top selling books (above average sales) in each year in column 5. The argument is similar to the previous experiment in that we would expect all shops to carry and sell those books. Again, we see a very similar behaviour for this sample as well.

TABLE 10: DEMAND FOR BOOKS ROBUSTNESS (WITH SUPER MARKETS & E-COMMERCE AS BASELINE)

	(1)	(2)	(3)	(4)
Model	OLS Logit	IV Logit	NL channel	NL Genre III
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.008***	-1.500***	-0.148***	-0.661***
	(0.000)	(0.237)	(0.025)	(0.101)
Group segment parameter (σ_g)			0.875***	0.874***
			(0.005)	(0.019)
Book age	-0.010***	-0.012***	-0.002***	-0.002***
	(0.000)	(0.001)	(0.000)	(0.000)
Paperback edition	3.058***	-8.276***	-0.757***	-4.628***
	(0.026)	(1.805)	(0.187)	(0.762)
Big publisher	1.956***	2.880***	0.248***	0.655***
	(0.014)	(0.180)	(0.014)	(0.090)
Post × IB indicator	-0.021***	1.437***	0.151***	0.641***
	(0.006)	(0.235)	(0.025)	(0.100)
Post × CB indicator	-0.538***	0.742***	0.062***	0.483***
	(0.008)	(0.207)	(0.021)	(0.087)
Post	0.233***	-0.525***	-0.092***	-0.341***
	(0.006)	(0.123)	(0.012)	(0.052)
IB channel indicator	1.599***	-0.102	0.003	-0.543***
	(0.007)	(0.275)	(0.033)	(0.116)
CB channel indicator	0.279***	-1.980***	-0.175***	-0.965***
	(0.006)	(0.363)	(0.035)	(0.154)
Observations	32,413,012	32,413,012	32,413,012	32,413,012
Clusters (ISBN)	645,018	645,018	645,018	645,018

Notes: All regressions include a full set of year, month and genre fixed effects. We did not estimate a Nested Logit model based on each book as a segment because such model was rejected in Table 6. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS data.

In the last two columns of Appendix Table D9 we use Switzerland as a placebo experiment and estimate a Logit and a Nested Logit model, corresponding respectively to column 2 and column 6 of our main result in Table 6. The interaction term of IB and the post indicator is statistically significant given the large dataset size (more than 43m observation). But it is approximately 20 times smaller in size than the one in our baseline specification for Italy and economically not significant, indicating that the change in regulation in Italy was the root cause of the change in behaviour in Italian IB stores.

6. Insights into the mechanisms

Our reduced form estimates suggest that the introduction of FBP is associated with an increase in the variety of book titles sold and a reduction in sales concentration in the market, mostly driven by the IB channel. Consistently, the estimates from the structural demand model show a significant upward shift in consumers' mean utility from independent bookstores induced by the FBP regulation.

One potential mechanism explaining these results, which has been suggested by the extant literature, relates to the relationship between retail price competition and effort. By relaxing price competition, bookstores could react to FBP by exerting more effort, in a way that directly affects the utility of consumers and prompt them into buying a larger variety of books. This increased effort can take different forms: from events in store, to additional customer care, to local advertising. In practice, bookstores may require more employees to provide these additional services. Another possibility is the entry of new bookshops following the introduction of FBP. With higher retail margins, more bookshops could enter the market, thus increasing the diffusion of book titles in the market through a widespread network of brick-and-mortar stores. These mechanisms are not mutually exclusive: FBP may affect both in-store effort and new entry.

We empirically investigate this issue by gathering information both on employment and number of firms in the Italian book sector from the Italian Chambers of Commerce. We obtained yearly data on the number of employees and operating firms in the book retail sector, as identified by the ATECO code[41], for the period 2009-2014. The data are further disaggregated by firm size, as measured by the number of employees. There are four size classes: 1 employee, 2-5 employees, 6-9 employees, and > 9 employees. To control for unobservable shocks that might confound the effect of FBP introduction, we gather the same data for a comparable sector not affected by the FBP regulation. We obtained information on employment and operating firms for stationery stores, which allows us to control for unobserved macroeconomic trends in a comparable Italian retail sector.[42] Then, we can compare the evolution of employment and number of firms for bookshops

[41] The ATECO code is an industry standard classification system adopted by the Italian Statistical Office (ISTAT). It is essentially the Italian version of Eurostat's NACE. Bookstores are identified by the code 47.61. Notably, it excludes second-hand retailers, which are identified by a different code (47.79). This is relevant since the FBP regulation does not apply to second-hand books.

[42] Stationery stores are identified by the ATECO code 47.62. They share with bookshops the same broad category 47.6, defined as "cultural recreational products retail". Moreover, they are organised within the same union (SIL).

vis-à-vis stationery stores around the introduction of the FBP regulation through a simple DiD regression in which treatment starts from 2011, accounting for year and sector-size fixed effects.[43]

TABLE 11: EMPLOYMENT AND NUMBER OF FIRMS IN THE BOOK MARKET

	(1)	(2)	(3)	(4)
Dependent variable	EMPLOYMENT		NUMBER OF FIRMS	
Post × Treated	0.073**		0.038	
	(0.030)		(0.031)	
Post × Treated × I{1 Employee}		0.005		-0.007
		(0.058)		(0.064)
Post × Treated × I{2-5 Employees}		0.090**		0.072**
		(0.040)		(0.032)
Post × Treated × I{6-9 Employees}		0.078**		0.050
		(0.036)		(0.051)
Post × Treated × I{>9 Employees}		0.119***		0.037
		(0.025)		(0.036)
Observations	48	48	48	48

Notes: This table presents the effects of FBP on employment and the number of bookstores. The dependent variable is either the log-number of employees (columns 1-2) or the log-number of operating firms (columns 3-4). The treatment group are bookstores, whereas the control group are stationary stores in Italy. Data are at the year (2009-2014), sector (bookshops and stationery stores), and firm size (4 classes) level. Post dummy takes value one from 2011 onwards. Standard errors robust to heteroskedasticity in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculation from the Italian Chambers of Commerce.

Table 11 collects the results from such an experiment for the log-number of employees (columns 1-2) and log-number of operating firms (columns 3-4). Columns 1 and 3 point to an average increase in employment (+7.3%) in bookshops with negligible effects on the number of operating firms. When we disentangle treatment effects by size classes, we observe employment rises everywhere except for bookshops with just one employee. Both pieces of evidence suggest that FBP regulation has no material impact on firm entry. On the contrary, it affects overall employment.[44] Focusing on the number of operating firms (column 4), we observe a significant increase only for bookshops with 2 to 5 employees. This is most likely not new entry, but it simply captures the mechanical change from the lowest class size (1 employee) to the next class when there are additional hires.

[43] Summary statistics are provided in Appendix Table B2. We drop from the estimation cells for sizes higher than 50 employees per firm as they show very little variation in the bookshop sector.

[44] Coefficients associated with the interaction terms of 2-5, 6-9, and > 9 employees are not statistically different from each other. The F-test associated with the null hypothesis of equality across these coefficients is 1.09.

These results should be read against a background of dwindling retail shops in general due to the rise of e-commerce. The reduction in price competition due to FBP seems to have allowed smaller bookshops to survive over and above this general trend: as competition got less tough, less efficient firms could survive in the industry for a longer period of time.

As a final look at the evidence that can suggest possible mechanisms related to effort, we look at available evidence of what bookshops actually do, and what book buyers say about them. We use web search and industry reports. These are not meant to suggest any causal evidence, but they are indicative of what the industry and the readers think about buying books.

The Italian Association of Independent Booksellers (ALI) is part of the Italian Chamber of Commerce and published a survey in 2022 on bookshops. This date is posterior to the FBP regulation. However, recall that Italy not only kept FBP in place since its inception, but further tightened it in 2020 reducing the maximum discount to 5%. Hence, the mechanism at work (reduced price competition but increase service effort competition) would still be in place in recent years. As part of the survey, bookshops were asked to report the main initiatives they were involved in during the past year. The most cited item (60% of bookshops) was author's talks in store, followed by educational activities in store (41%), and organization of seminars and literary festivals (31%). These activities are consistent with bookstores putting effort and resources into providing services for their readers. See Appendix Figure B1 for the survey results.

Last, we investigate readers' satisfaction with their book purchase by collecting a large sample of readers' comments on bookstores. We search Google Reviews in the period 2016-2024. Google Review launched in Italy only in 2014, so we cannot conduct an analysis during the period of the introduction of FBP. As with the previous survey, however, FBP regulation was still in place in recent years (and further strengthened) so the reviews are possibly indicative of a similar climate among readers. We assemble a dataset that covers more 2,250 bookshops in Italy, including both CBs and IBs. For each bookshop, we collect all the ratings and possible reviews that customers left over time. Overall, we have a dataset with more than 500,000 observations. We are aware of selection issues of ratings and reviews, as not every customer leaves them. However, here we are mostly interested in the possible *differences* between IBs and CBs, as we argued earlier that service effort should be particularly pronounced among IBs. Hence selection should be less problematic, as – if it exists – it would affect both types of stores. When it comes to reviews, we have employed

machine learning techniques to analyse texts automatically and group reviews into main topics, as well as attribute a sentiment (positive/neutral/negative) to each one of them. See Appendix B and C for more details on the dataset and on the machine learning technique we used.

TABLE 12: BOOKSHOPS' REVIEWS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			IB		CB			IB-CB	
	Obs	Topic freq.	Obs	Mean	Obs	Mean	Mean diff.	s.e.	p-value
Review ratings									
Rating	548,421		272,186	4.543	276,235	4.319	0.224	0.002	0.000
Sentiment score									
Staff	473,003	46%	257,519	0.861	215,484	0.754	0.106	0.002	0.000
Product discovery	261,241	25%	133,664	0.766	127,577	0.613	0.153	0.002	0.000
Product assortment	164,604	16%	86,561	0.824	78,043	0.701	0.123	0.003	0.000
Organization of events	76,569	7%	39,167	0.544	37,402	0.256	0.289	0.006	0.000
Pricing	55,553	6%	25,074	0.380	30,479	0.354	0.026	0.007	0.000

Notes: The table shows summary statistics and mean differences between IB and CB for review ratings and sentiment score across topics. Review ratings range from 0 to 5, while sentiment score takes either value -1 (negative), 0 (neutral), or 1 (positive).
Source: Authors' calculation from Google Reviews on a sample of more than 2,250 bookshops in Italy.

Table 12 summarises the results. The first row shows that reviews of bookstores are generally positive, and particularly so for IB compared to CB. Their difference in review ratings between the two types of shops is statistically significant and, as we show in Appendix Figure B2, persistent over time in a period when FBP regulation was in place. The other rows contain our findings on topics and their sentiment. There are two main take aways. First, the majority of the comments that are left concerns the friendliness of staff (46% of the total comments; a reviewer can leave multiple comments), followed by product discovery (25%), product assortment (16%), and organisation of events (7%). Prices are less prominent in the discussion (5% of the comments). Second, we find that there are statistically significant differences between IB and CB, with more favourable sentiment for IB when it comes to topics that concern friendly staff, product discovery, book assortment, and events organised by the bookshop. All this evidence is consistent with higher effort being put by IB compared to CB. The only category where we find a narrow difference in absolute value between CB and IB is when reviews talk about price. Notice that also the sentiment value attached to prices is generally much less positive compared to the other topics. This is expected in a period when competition over price was muted by the regulation.

7. Conclusions

We offer systematic evidence of the impact of FBP on the prices and variety of books. We use the universe of the books sold in Italy, before and after the introduction of a FBP law, and use Switzerland as a relevant control as Italian books are sold there too over the same period, but with but no FBP law in place.

We find that the regulation had an impact only downstream, among booksellers, but not upstream among publishers. The effects downstream are heterogeneous, with large differences between small independent bookstores and larger book chain stores.

After the reform, bookstores reduced considerably the intensity of competition over the discounts they offer, over and above what was required by the reform: discounts decreased well below the maximum allowed discount that was directly capped by the law. But the story does not end there, as bookshops seem to have then turned to non-price aspects, possibly shifting towards services and effort for customers. Book titles that were in the catalogue before, but hardly commanded any sales, after the reform started being bought by readers.[45]

Through the estimation of a structural demand model, where consumers are penalized by price increases but enjoy variety, we estimate that, overall, the reform seems to have benefited readers in the Italian book market.

The policy implications of our findings are nuanced. FBP reduces price competition, which is detrimental to consumers. If that was the only aspect of competition in a market, the policy stance on FBP would be clear. But in industries where it is conceivable that competition occurs also on non-price aspects, trade-offs emerge. In particular, in sectors where the "service effort" argument is credible, *and* the industry is fairly competitive, it would be not very plausible that the extra profits accruing from higher prices could be kept by competing retailers. Rather, they would have to shift their competitive focus on those other non-price dimensions. Hence the trade-off: consumers lose on price but can gain over non-price dimensions. In our context, these features are quite compelling: the downstream market structure is fragmented (4,600 bookshops, of which 3,900 are independent), and the service free-riding aspect has a long history of being relevant. In

[45] Quoting Paul Krugman on X (formerly Twitter): "Why I still visit physical bookstores. I can find anything I'm looking for on Amazon. Bookstores are where I find what I wasn't looking for." https://x.com/paulkrugman/status/1692157523728437476?s=20

other industries where, instead, the downstream structure is more concentrated, or the non-price aspects were less convincing, the trade-off may well tilt in other directions.

We hope that our results contribute to the understanding of RPM-type regulations in markets generally, and the impact that price reforms might have on non-price market aspects. Cultural products, such as books, capture well both features.

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ONLINE APPENDIX

Appendix A Additional evidence for Section 4 (reduced form results)

Table A1 focuses on identical books sold both in the Italian and Swiss markets. Despite the drastic reduction in the sample size, results still show an average price increase of about 5% in the IB channel. Results from the CB+EC channel suggest either a small negative or null effect from the introduction of FBP. Both sets of results are in line with our main specification in Table 2.

TABLE A1: PRICE EFFECTS COMPARING SAME BOOKS IN THE TWO MARKETS

	(1)	(2)	(3)	(4)	(5)	(6)
		Both markets			Both markets and channels	
VARIABLES	All data	CB+EC	IB	All data	CB+EC	IB
Mid × Treated	0.017**	-0.007	0.045***	0.042***	0.026***	0.044***
	(0.007)	(0.008)	(0.010)	(0.008)	(0.009)	(0.010)
Post × Treated	-0.003	-0.035***	0.050***	0.036***	0.015	0.049***
	(0.008)	(0.008)	(0.010)	(0.009)	(0.010)	(0.010)
Time FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES
ISBN FE	YES	YES	YES	YES	YES	YES
Observations	190,056	121,471	68,204	178,808	110,585	67,797

Notes: This table presents the effects of FBP on retail prices when we restrict the sample to books (identified by their ISBN) selling in both the Italian and Swiss markets (columns 1-3). Columns 4-6 further restrict the sample to books selling in both markets and distribution channels. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

Tables A2 and A3 provide statistical tests for the parallel trends in retail prices before the approval of FBP. Table A2 presents the results using a linear parallel trend. The trend in the Italian market is very similar to the Swiss one, as we also saw in Figure 2 in the main text. Although statistically significant due to the large sample size, the price trend in the Italian market deviates from the Swiss by zero up to the fourth decimal.

TABLE A2: LINEAR PARALLEL TREND TEST ON RETAIL PRICES

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All data	CB+EC	IB	All data	CB+EC	IB
Trend	0.0014***	0.0014***	0.0018***	-0.0001**	-0.0002***	0.0005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trend × Treated	0.0009***	0.0008***	0.0008***	0.0009***	0.0010***	0.0002**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES
ISBN FE				YES	YES	YES
Observations	1,785,635	1,405,508	380,127	1,784,371	1,403,870	379,646

Notes: This table presents estimated coefficients from a test of parallel trends for retail prices between treatment and control group in the pre-treatment period (January 2009-February 2011). Trend is a linear trend in time, while Treated identifies the Italian market. The coefficient associated to the interaction Trend × Treated captures the deviation in the trend of retail prices in the treatment group over and above the one of the control group. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

TABLE A3: NON-PARAMETRIC PARALLEL TREND TEST ON RETAIL PRICES

	(1)	(2)	(3)	(4)	(5)	(6)
Sample	All data	CB+EC	IB	All data	CB+EC	IB
Jan 2009 × Treated	-	-	-	-	-	-
Feb 2009 × Treated	-0.022***	-0.029***	0.005	-0.023***	-0.029***	0.004***
	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.001)
Mar 2009 × Treated	-0.005***	-0.008***	0.003	-0.005***	-0.007***	0.003***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
Apr 2009 × Treated	-0.029***	-0.038***	0.005	-0.027***	-0.036***	0.008***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
May 2009 × Treated	-0.005**	-0.006**	-0.003	-0.002**	-0.003***	-0.000
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.001)
June 2009 × Treated	-0.035***	-0.043***	-0.007	-0.032***	-0.041***	-0.004***
	(0.002)	(0.003)	(0.005)	(0.001)	(0.001)	(0.001)
July 2009 × Treated	-0.026***	-0.032***	-0.011**	-0.026***	-0.032***	-0.008***
	(0.003)	(0.003)	(0.005)	(0.001)	(0.001)	(0.001)
Aug 2009 × Treated	-0.024***	-0.029***	-0.016***	-0.019***	-0.023***	-0.008***
	(0.003)	(0.003)	(0.005)	(0.001)	(0.001)	(0.001)
Sep 2009 × Treated	-0.001	0.000	-0.005	0.003***	0.005***	-0.003***
	(0.003)	(0.003)	(0.005)	(0.001)	(0.001)	(0.001)
Oct 2009 × Treated	0.018***	0.020***	-0.001	0.020***	0.023***	-0.000
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
Nov 2009 × Treated	0.013***	0.013***	0.004	0.009***	0.011***	-0.000
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
Dec 2009 × Treated	-0.006**	-0.008***	0.008	-0.008***	-0.009***	-0.000
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
Jan 2010 × Treated	-0.000	-0.004	0.017***	-0.002**	-0.004***	0.010***
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.002)
Feb 2010 × Treated	0.002	-0.002	0.010*	-0.004***	-0.007***	0.003**
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
Mar 2010 × Treated	0.000	-0.001	-0.002	-0.003***	-0.002	-0.008***
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
Apr 2010 × Treated	-0.001	-0.005	0.006	-0.002**	-0.003***	-0.004***
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)
May 2010 × Treated	0.002	0.001	0.007	0.000	0.001	0.001
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.002)
June 2010 × Treated	-0.007**	-0.011***	0.005	-0.007***	-0.010***	0.002
	(0.003)	(0.004)	(0.006)	(0.001)	(0.001)	(0.001)
July 2010 × Treated	-0.001	-0.004	0.006	-0.001	-0.002*	-0.002
	(0.003)	(0.004)	(0.007)	(0.001)	(0.001)	(0.001)
Aug 2010 × Treated	-0.015***	-0.023***	0.009	-0.009***	-0.014***	0.012***
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Sep 2010 × Treated	-0.000	-0.005	0.007	0.006***	0.005***	0.001
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Oct 2010 × Treated	0.004	0.002	0.000	0.007***	0.010***	-0.008***
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Nov 2010 × Treated	0.024***	0.022***	0.013*	0.023***	0.027***	-0.001
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Dec 2010 × Treated	0.001	-0.003	0.009	0.002	0.002*	-0.004**
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Jan 2011 × Treated	0.022***	0.020***	0.020***	0.023***	0.026***	0.010***
	(0.004)	(0.004)	(0.007)	(0.001)	(0.001)	(0.002)
Feb 2011 × Treated	-0.015***	-0.028***	0.029***	-0.017***	-0.025***	0.016***
	(0.004)	(0.004)	(0.008)	(0.001)	(0.001)	(0.002)
Time FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES
ISBN FE				YES	YES	YES
p-value H_0: Coef. jointly equal to zero	104.56***	134.61***	6.29***	436.72***	506.24***	80.62***
Observations	1,785,635	1,405,508	380,127	1,784,371	1,403,870	379,646

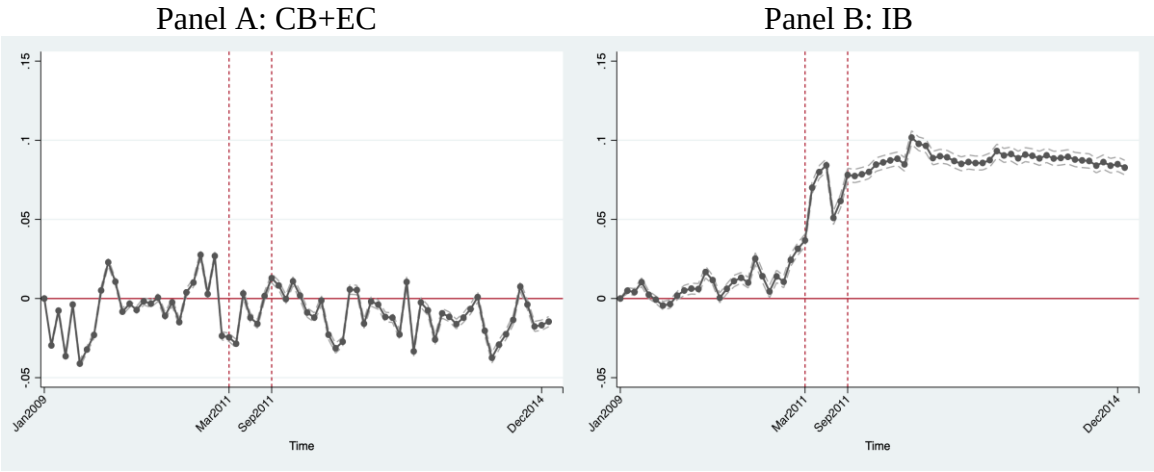
Notes: This table presents estimated coefficients from a parallel trend test for retail prices in which time dummies are interacted with the treatment identifier in the pre-treatment period (January 2009-February 2011). Treated identifies the Italian market. The first interaction is excluded to avoid multicollinearity. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations based on the GfK POS data.

Table A3 estimates the parallel trend non-parametrically by interacting the treatment with time indicators. In all specifications, we reject that pre-FBP interactions are jointly equal zero. However, the coefficients are again small, especially when compared to the post-treatment effects, as we can see in Figure 2.

The dynamics of the treatment effects confirm the different price reactions in response to FBP introduction across the channels. Figure A1 plots estimated coefficients from event study models in which the treatment identifier is interacted with time indicators, separately for the two channels. We observe a clear upward shift in price induced by FBP in the IB channel, whereas for CB+EC, we observe a very small negative effect.

FIGURE A1: TREATMENT EFFECT DYNAMICS FOR RETAIL PRICES



Notes: The figure shows event study coefficients with the associated 95% confidence interval. Regressions include interactions between time dummies and treatment identifier, as well as time, market, and ISBN fixed effects. The first interaction (January 2009) is normalised to zero. The sample used for estimation includes books that sell at least one unit for 80% of the months since its publication date. Standard errors are clustered by ISBN.
Source: Authors' calculations based on the GfK POS data.

Table A4 collects the results from different sample selections. Columns 1-3 show DiD estimates from the full sample, that is the universe of books sold in Italy or Switzerland. In this case, the estimates suggest an overall small and negative effect, mostly driven by the CB+EC channel. However, as discussed in the main text, this specification is contaminated by the entry and exit of books around the regulation. Columns 4-6 focus on books with a sufficient amount of sales (at least 100 units in Italy and 50 in Switzerland) throughout the book lifetime. The large reduction in the number of observations compared to Columns 1-3 confirms that low-sale books are a serious concern. We find an overall positive price effect arises (+1.3%), mostly driven by the IB channel. Similar results are obtained when we further clean the sample by constructing a panel of books for which we observe the evolution of retail price around the introduction of FBP. Columns 7-9 focus on books selling at least one unit in each month within a 1-year window around the regulation, while columns 10-12 select books selling at least one unit in each month since the day of publication. In both cases we observe a clear price increase driven by IB. Moreover, we also detect a very small negative or zero effect in the CB+EC channel.

TABLE A4: PRICE EFFECTS FROM ALTERNATIVE SAMPLING

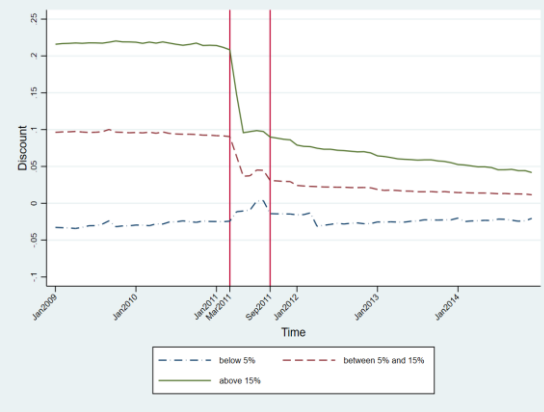
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Universe of Books			Unit sales higher than 100			Cont. 1-year around FBP			Cont. since publication date		
Sample	All data	CB+EC	IB	All data	CB+EC	IB	All data	CB+EC	IB	All data	CB+EC	IB
Mid × Treated	-0.006***	-0.018***	0.008***	0.005***	-0.012***	0.026***	0.003***	-0.006***	0.047***	0.010***	0.001	0.058***
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Post × Treated	-0.005***	-0.025***	0.012***	0.013***	-0.011***	0.031***	0.019***	0.006***	0.074***	0.031***	0.021***	0.083***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
Time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	27,244,897	18,668,170	8,364,074	14,746,424	9,539,730	5,206,448	3,409,201	2,808,017	601,184	3,054,102	2,451,494	600,252

Notes: This table presents the effects of FBP on retail for different samples of books. Columns 1-3 use the full dataset, that is the universe of books sold in the Italian and Swiss markets. Columns 4-6 focus on books selling more than 100 (50) units in Italy (Switzerland) throughout their lifetime. Columns 7-9 exploit books with continuous sales during a 1-year window around the regulation. Finally, columns 10-12 make use of books with continuous sales since their publication date. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

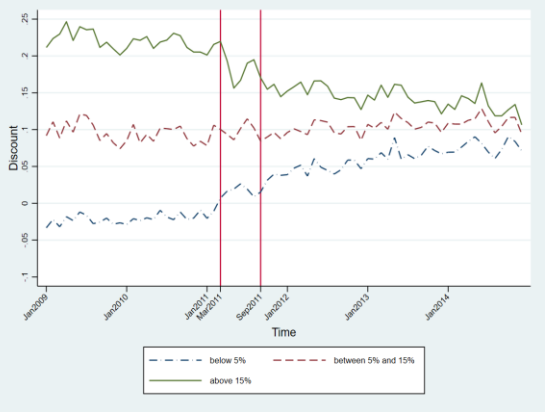
Figure A2 shows the discounts, by channel, before and after the regulation. Each diagram reports three curves: books with discounts above 15% prior to the regulation (continuous green), those with discounts between 5% and 15% (dashed red), and those with discounts below 5% (dashed blue). While the regulation affected in principle directly only the first class, it is clear that it had an impact on every other discount class. The range of discounts decreased considerably over time. This is what we call "discount convergence" in the main text (Section 4.1.1).

FIGURE A2: EVOLUTION OF DISCOUNTS BY CHANNEL

Panel A: Discount trends in IB



Panel B: Discount trends in CB+EC

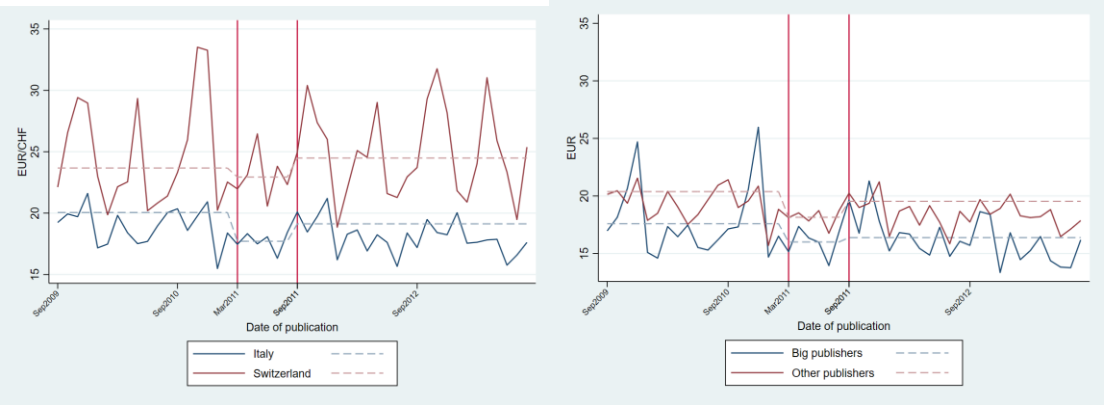


Notes: The figure shows the monthly average discount across books with different discount levels before the introduction of FBP in Italy in IB (Panel A) and CB+EC (Panel B). The sample used for these statistics includes books published before regulation and selling at least one unit for 80% of the months since their publication date.
Source: Authors' calculations based on the GfK POS data.

The next set of figures and tables should be read as providing supporting evidence for Table 3 in the main text. Figure A3 shows cover prices of books in Italy and Switzerland (Panel A) and, within Italy, of large and small publishers (Panel B). Tables A5-A6 provide statistical tests for the parallel trend for cover prices. Table A5 shows no difference in the (linear) trends of cover prices before FBP between treatment and control group. Table A6 provides a non-parametric test showing interaction coefficients that are generally not statistically significant in the pre-FBP period. Finally, Figure A4 displays the dynamics of the treatment effect on cover prices showing no difference between treatment and control groups both before and after FBP.

FIGURE A3: EVOLUTION OF BOOK COVER PRICES

Panel A: Book cover prices in Italy & Switzerland Panel B: Book cover prices in Italy (big vs. other publishers)



Notes: The figure shows the monthly average cover price for the universe of books published in Italy within a two-year window around the introduction of FBP. In Panel A, the comparison group includes books published in Switzerland by non-Italian Swiss publishers. Panel B compares cover price for books published by big publishers *versus* all the others within the Italian market.
Source: Authors' calculations based on the GfK POS data.

TABLE A5: LINEAR PARALLEL TREND TEST ON COVER PRICES

	(1)	(2)	(3)	(4)	(5)
Sample	ITALY & SWITZERLAND			ITALY	
Trend	-0.006*	-0.003	-0.001	0.000	0.000
	(0.003)	(0.003)	(0.002)	(0.000)	(0.000)
Trend × Treated	0.004	0.002	0.001	-0.001	-0.001
	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)
Date of publication FE	YES	YES	YES	YES	YES
Market FE	YES	YES	YES		
Genre IV FE		YES	YES		YES
Publisher FE			YES	YES	YES
Observations	90,632	90,632	90,143	83,213	83,213

Notes: This table presents estimated coefficients from a test of parallel trends for cover prices between treatment and control group in the pre-treatment period (September 2009-February 2011). Trend is a linear trend in time (date of publication). In columns 1-3 the treatment group are all the books published in Italy, whereas the control group are all the books published in Switzerland by German or French Swiss publishers. In the last two columns the treatment group are the books published by large publishers in Italy, whereas the control group are the books published by small publishers in Italy. The coefficient associated to the interaction Trend × Treated captures the deviation in the trend of cover prices in the treatment group over and above the one of the control group. Standard errors clustered by publisher in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

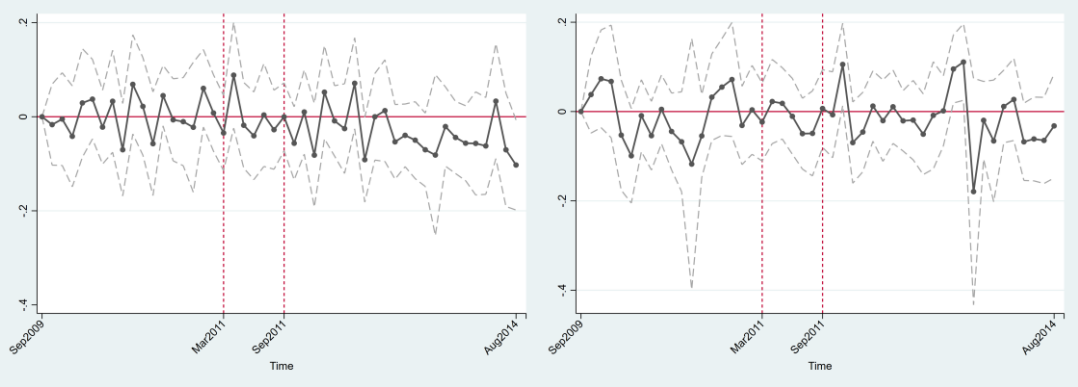
TABLE A6: NON-PARAMETRIC PARALLEL TREND TEST ON COVER PRICES

	(1)	(2)	(3)	(4)	(5)
Sample	ITALY & SWITZERLAND			ITALY	
Sep 2009 × Treated	-	-	-	-	-
Oct 2009 × Treated	-0.165*	-0.085	-0.005	0.023	0.027
	(0.088)	(0.063)	(0.046)	(0.052)	(0.047)
Nov 2009 × Treated	-0.249***	-0.104	-0.011	0.057	0.061
	(0.085)	(0.066)	(0.051)	(0.062)	(0.059)
Dec 2009 × Treated	-0.123	-0.130	-0.015	0.096	0.088
	(0.152)	(0.100)	(0.057)	(0.078)	(0.070)
Jan 2010 × Treated	0.099	0.078	0.047	-0.056	-0.057
	(0.183)	(0.136)	(0.057)	(0.068)	(0.063)
Feb 2010 × Treated	0.109	0.045	0.049	-0.133**	-0.106**
	(0.091)	(0.068)	(0.043)	(0.064)	(0.054)
Mar 2010 × Treated	0.045	0.042	-0.025	-0.040	-0.026
	(0.058)	(0.056)	(0.040)	(0.047)	(0.045)
Apr 2010 × Treated	-0.021	-0.003	0.040	-0.053	-0.059
	(0.088)	(0.069)	(0.056)	(0.045)	(0.040)
May 2010 × Treated	-0.286**	-0.175**	-0.060	0.012	0.008
	(0.119)	(0.088)	(0.053)	(0.050)	(0.043)
June 2010 × Treated	0.199	0.195*	0.065	-0.089*	-0.060
	(0.147)	(0.112)	(0.055)	(0.053)	(0.048)
July 2010 × Treated	0.213*	0.160	0.025	-0.092	-0.075
	(0.126)	(0.101)	(0.052)	(0.062)	(0.061)
Aug 2010 × Treated	-0.003	-0.101	-0.044	-0.107	-0.101
	(0.088)	(0.070)	(0.060)	(0.129)	(0.129)
Sep 2010 × Treated	0.025	0.040	0.043	-0.058	-0.063
	(0.051)	(0.045)	(0.034)	(0.056)	(0.051)
Oct 2010 × Treated	-0.202**	-0.077	0.007	0.007	0.014
	(0.092)	(0.066)	(0.045)	(0.060)	(0.055)
Nov 2010 × Treated	-0.323***	-0.170**	-0.006	0.049	0.047
	(0.099)	(0.078)	(0.049)	(0.056)	(0.056)
Dec 2010 × Treated	-0.157	-0.127	0.014	0.112	0.122*
	(0.153)	(0.132)	(0.072)	(0.084)	(0.063)
Jan 2011 × Treated	0.087	0.099	0.060	-0.038	-0.033
	(0.166)	(0.102)	(0.047)	(0.061)	(0.051)
Feb 2011 × Treated	0.098	0.006	0.018	-0.020	-0.010
	(0.081)	(0.062)	(0.043)	(0.057)	(0.054)
Date of publication FE	YES	YES	YES	YES	YES
Market FE	YES	YES	YES		
Genre IV FE		YES	YES		YES
Publisher FE			YES	YES	YES
F-test H_0 : Coef. jointly equal to zero	2.61***	1.34	0.89	3.20***	3.56***
Observations	90,632	90,632	90,143	83,213	83,213

Notes: This table presents estimated coefficients from a parallel trend test for cover prices in which date of publication dummies are interacted with the treatment identifier in the pre-treatment period (September 2009-February 2011). In columns 1-3 the treatment group are all the books published in Italy, whereas the control group are all the books published in Switzerland by German or French Swiss publishers. In the last two columns the treatment group are the books published by large publishers in Italy, whereas the control group are the books published by small publishers in Italy. The first interaction is excluded to avoid multicollinearity. Standard errors clustered by publisher in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

FIGURE A4: DYNAMICS OF THE TREATMENT EFFECT ON COVER PRICE

Panel A: Italy vs. Switzerland | Panel B: Big vs. small publishers

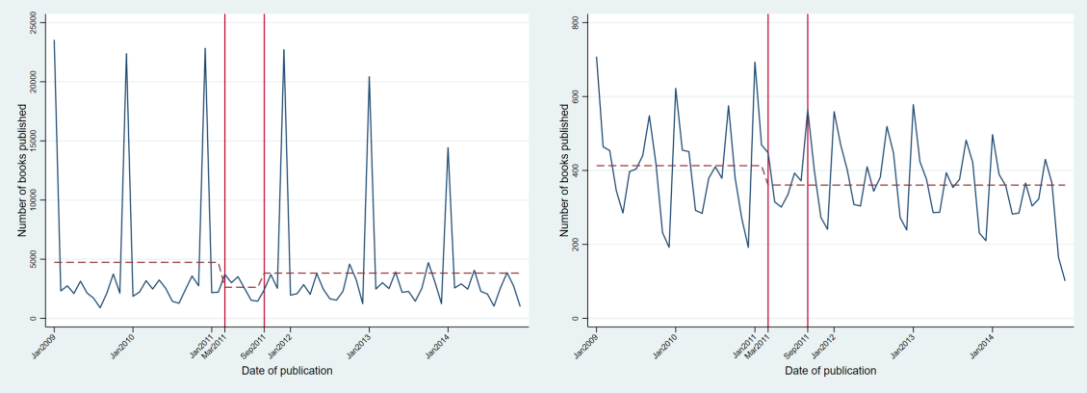


Notes: The figure shows event study coefficients with the associated 95% confidence interval. In Panel A, the treatment group includes all the books published in Italy, whereas the control group are all the books published in Switzerland by German or French Swiss publishers. The regression includes include interactions between date of publication dummies and treatment identifier, as well as date of publication, market, genre IV, and publisher fixed effects. In Panel B, the treatment group are the books published by large publishers in Italy, whereas the control group are the books published by small publishers in Italy. In this case date of publication, genre IV, and publisher fixed effects are included in the estimation. The first interaction (September 2009) is normalised to zero. Standard errors clustered by publisher in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

Figure A5 shows the number of titles published in Italy and Switzerland over time. The figure can be read alongside Table 4 in the main text.

FIGURE A5: NUMBER OF BOOKS PUBLISHED IN THE TWO MARKETS

Panel A: Books published in Italy | Panel B: Books published in Switzerland



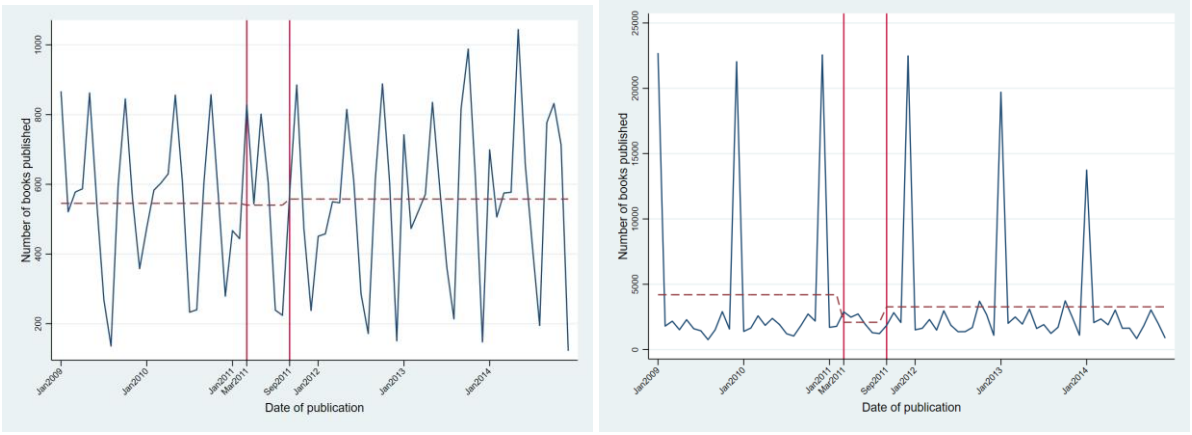
Notes: The figure shows the monthly number of books published in Italy (Panel A) and Switzerland (Panel B) around the introduction of FBP. In Switzerland we count the number of books published by Swiss publishers, but excluding Italian-Swiss publishers to avoid potential contaminations between the two markets.
Source: Authors' calculations based on the GfK POS data.

Figure A6 reports the evolution over time of the number of titles published in Italy, distinguishing between small and large publishers. The figure can be read alongside Table 4 in the main text.

FIGURE A6: NUMBER OF BOOKS PUBLISHED IN ITALY BY BIG AND SMALL PUBLISHERS

Panel A: Books published by big publishers

Panel B: Books published by the other publishers



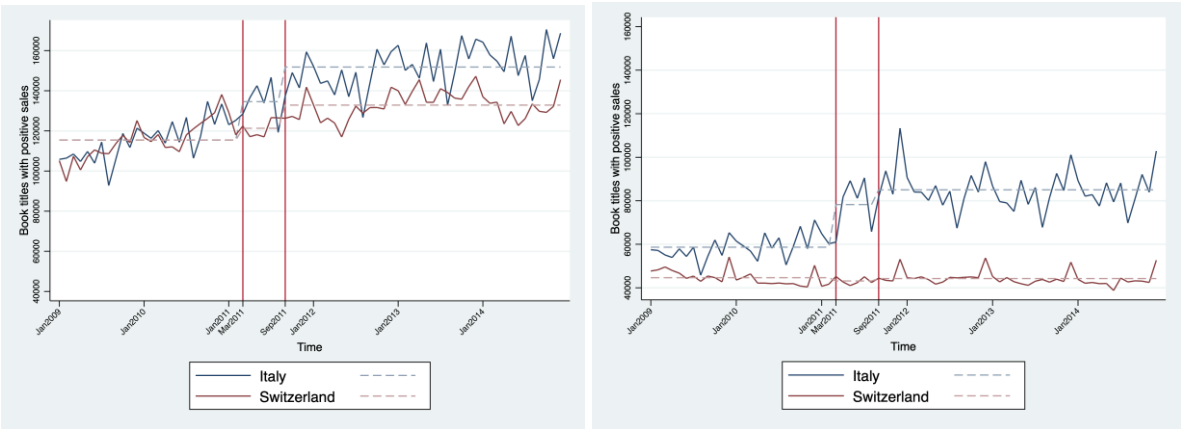
Notes: The figure shows the monthly number of books published in Italy by big publishers (Panel A) and by the other small publishers (Panel B) around the introduction of FBP.
Source: Authors' calculations based on the GfK POS data.

Figure A7 shows the evolution of the number of book titles sold in Italy and Switzerland. The figure can be read alongside Table 5 in the main text.

FIGURE A7: NUMBER OF BOOKS SOLD IN THE TWO MARKETS

Panel A: CB+EC

Panel B: IB



Notes: The figure shows the evolution of the total number of book titles with positive sales in the two markets (Italy and Switzerland) for each distribution channel.
Source: Authors' calculations based on the GfK POS data.

Table A7 shows the results of the impact of FBP discussed in Section 4.2.2 when we use alternative indexes of concentration. We use the C100 index of concentration for the top 100 book titles (columns 1-3) and the HHI index (i.e., the sum of the square of the sale share of each book; columns 4-6). In both cases, concentration decreases with FBR in the IB channel.

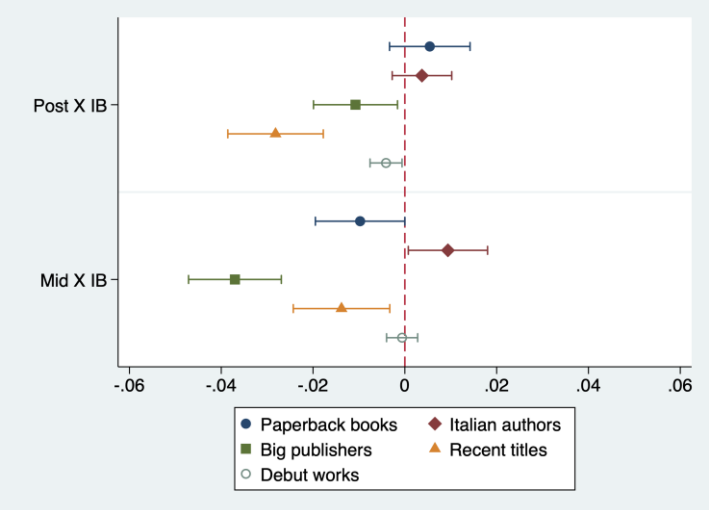
TABLE A7: IMPACT OF FBP ON SALES CONCENTRATION

	(1)	(2)	(3)	(4)	(5)	(6)
		C100			HHI	
Sample	All data	CB+EC	IB	All data	CB+EC	IB
Mid × Treated	-0.0146**	-0.0093	-0.0198*	-0.0001	-0.0002	-0.0001
	(0.007)	(0.011)	(0.011)	(0.000)	(0.000)	(0.000)
Post × Treated	-0.0035	0.0132*	-0.0202***	-0.0000	0.0000	-0.0001**
	(0.004)	(0.008)	(0.004)	(0.000)	(0.000)	(0.000)
Time FE	YES	YES	YES	YES	YES	YES
Market FE	YES	YES	YES	YES	YES	YES
Observations	288	144	144	288	144	144

Notes: This table presents the effects of FBP on sales concentration in the book market. In columns 1-3 the dependent variable is the concentration ratio of the top 100 books (in terms of market share), while in columns 4-6 the dependent variable is the Herfindal index. Standard errors robust to heteroskedasticity in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

Figure A8 plots the estimated variation of market shares of IB compared to CB+EC, after the introduction of FBP, across different book characteristics.

FIGURE A8: DIFFERENCE IN VARIETY SOLD BETWEEN IB AND CB+EC ACROSS BOOK CHARACTERISTICS

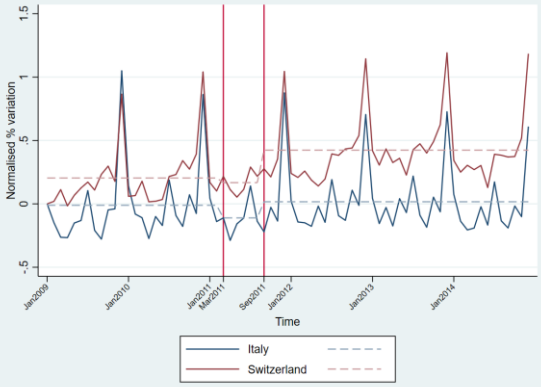


Notes: The figure shows variations in the market shares of different categories of books in IB compared to the baseline CB+EC channel after the introduction of FBP. *Mid* is a dummy that identifies the period between the announcement and the implementation period, while *Post* identifies the post-FBP implementation period. Standard errors are robust to heteroscedasticity.
Source: Authors' calculations based on the GfK POS data.

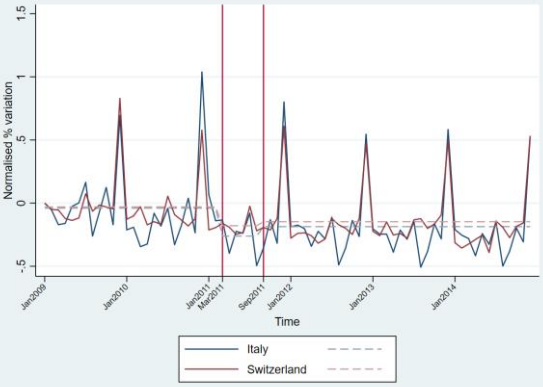
Figure A9 shows the evolution of aggregate book sales in Italy and Switzerland, separately for the two channels. Table A8 collects the corresponding results of the impact of FBP on aggregate sales.

FIGURE A9: VARIATION OF AGGREGATE SALES IN THE TWO MARKETS

Panel A: CB+EC



Panel B: IB



Notes: The figure shows the evolution of the normalised percentage variation in total unit sales in Italy and Switzerland, separately for CB+EC and IB. The baseline period is January 2009.
Source: Authors' calculations based on the GfK POS data.

TABLE A8: IMPACT OF FBP ON AGGREGATE SALES

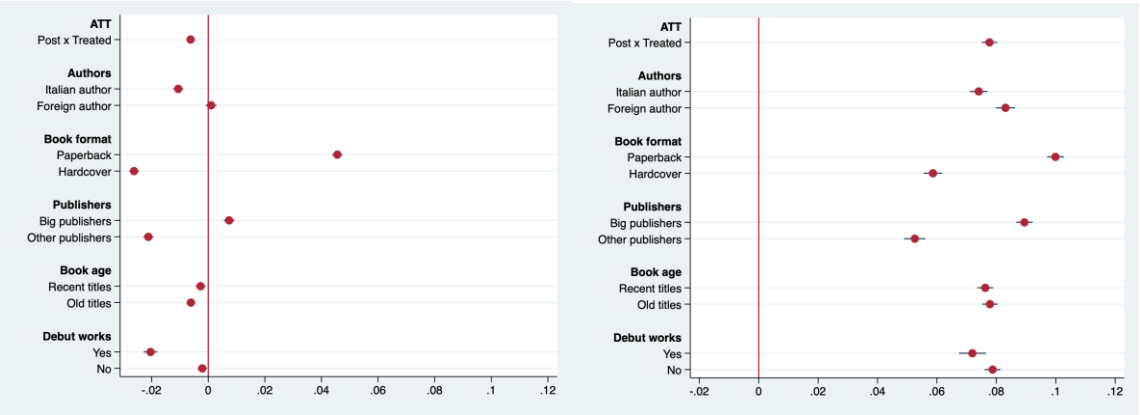
	(1)	(2)	(3)	(4)
Sample	All data	All data	CB+EC	IB
Mid × Treated	-0.080	-0.080	-0.064	-0.096
	(0.266)	(0.052)	(0.053)	(0.082)
Post × Treated	-0.086	-0.086**	-0.133***	-0.038
	(0.146)	(0.036)	(0.037)	(0.044)
Time FE	YES	YES	YES	YES
Market FE	YES	YES	YES	YES
Channel FE		YES		
Observations	288	288	144	144

Notes: This table presents the effects of FBP on aggregate sales in the book market. The dependent variable is the logarithm of total unit sales in the two market (Italy and Switzerland) and distribution channels (CB+EC and IB). *Treated* identifies the Italian market. *Mid* is a dummy taking value 1 in the period between the announcement and the implementation period, while *Post* identifies the post-FBP implementation period. Standard errors robust to heteroskedasticity in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

Figure A10 shows heterogeneous treatment effects of FBP on retail prices across different book categories. The full set of estimates are collected in Table A9.

FIGURE A10: HETEROGENEOUS TREATMENT EFFECTS ON RETAIL PRICES

Panel A: CB+EC Panel B: IB



Notes: The figure shows heterogeneous treatment effects of FBP on retail price, using coefficients from Table A6, along with the 95% confidence intervals. All regressions include time, market, and ISBN fixed effects. The sample used for estimation includes books that sell at least one unit for 80% of the months since its publication date. Standard errors clustered by ISBN.
Source: Authors' calculations based on the GfK POS data.

TABLE A9: HETEROGENEOUS TREATMENT EFFECTS ON RETAIL PRICE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Sample	All data	CB+EC	IB	All data	CB+EC	IB	All data	CB+EC	IB	All data	CB+EC	IB	All data	CB+EC	IB
Mid × Treated × Italian author	0.005***	-0.009***	0.057***												
	(0.001)	(0.001)	(0.001)												
Post × Treated × Italian author	0.009***	-0.011***	0.074***												
	(0.001)	(0.001)	(0.002)												
Mid × Treated × Foreign author	0.005***	-0.008***	0.050***												
	(0.001)	(0.001)	(0.002)												
Post × Treated × Foreign author	0.022***	0.001	0.083***												
	(0.001)	(0.001)	(0.002)												
Mid × Treated × Paperback				0.010***	-0.010***	0.058***									
				(0.001)	(0.001)	(0.001)									
Post × Treated × Paperback				0.064***	0.046***	0.100***									
				(0.001)	(0.001)	(0.002)									
Mid × Treated × Hardcover				0.001	-0.010***	0.049***									
				(0.001)	(0.001)	(0.002)									
Post × Treated × Hardcover				-0.010***	-0.026***	0.059***									
				(0.001)	(0.001)	(0.002)									
Mid × Treated × Big publishers							0.009***	-0.010***	0.062***						
							(0.001)	(0.001)	(0.001)						
Post × Treated × Big publishers							0.031***	0.007***	0.089***						
							(0.001)	(0.001)	(0.002)						
Mid × Treated × Other publishers							-0.002**	-0.009***	0.037***						
							(0.001)	(0.001)	(0.002)						
Post × Treated × Other publishers							-0.008***	-0.021***	0.053***						
							(0.001)	(0.001)	(0.002)						
Mid × Treated × Recent titles										0.009***	-0.004***	0.060***			
										(0.001)	(0.001)	(0.002)			
Post × Treated × Recent titles										0.015***	-0.003***	0.076***			
										(0.001)	(0.001)	(0.002)			
Mid × Treated × Old titles										0.004***	-0.010***	0.053***			
										(0.001)	(0.001)	(0.001)			
Post × Treated × Old titles										0.014***	-0.006***	0.078***			
										(0.001)	(0.001)	(0.002)			
Mid × Treated × Debut works													0.001	-0.010***	0.055***
													(0.001)	(0.001)	(0.002)
Post × Treated × Debut works													-0.004**	-0.020***	0.072***
													(0.002)	(0.002)	(0.003)
Mid × Treated × Other works													0.006***	-0.008***	0.054***
													(0.001)	(0.001)	(0.001)
Post × Treated × Other works													0.019***	-0.002**	0.079***
													(0.001)	(0.001)	(0.002)
Observations	8,562,293	6,524,442	2,037,851	8,562,293	6,524,442	2,037,851	8,562,293	6,524,442	2,037,851	8,562,293	6,524,442	2,037,851	8,562,293	6,524,442	2,037,851

Notes: The table presents heterogeneous treatment effects of FBP on retail price. *Mid* is a dummy that identifies the period between the announcement and the implementation period, while *Post* identifies the post-FBP implementation period. Estimated coefficients derive from an extension of equation (3) in which $Mid \times Treated$ and $Post \times Treated$ are further interacted with identifiers for book characteristics. All regressions include ISBN, market, and time fixed effects. The sample used for estimation includes books that sell at least one unit for 80% of the months since its publication date. Standard errors clustered by ISBN in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors' calculations based on the GfK POS data.

Appendix B

This appendix reports additional summary statistics about the Italian and the Swiss markets. Table B1 reports the summary statistics for Swiss dataset. Table B2 reports summary statistics of the dataset used for the employment analysis in Section 6. Figure B1 reports the survey results mentioned in Section 6.[46]

TABLE B1: SUMMARY STATISTICS FOR THE SWISS MARKET

Variable		Mean	Std. Dev.	Min	Max	Obs
All data						
Unit sales		7.172	46.280	1	30817	12,231,709
Price (CHF)		24.362	20.333	0.010	600	12,231,709
Cover price (CHF)		17.303	17.351	0	3200	12,231,709
Age (monthly)		40.805	43.931	0	299	12,231,709
Paperback		0.236	0.424	0	1	12,231,709
Italian author		0.010	0.098	0	1	12,231,709
CB+EC						
Unit sales		7.281	51.983	1	30817	9,042,304
Price (CHF)		23.947	20.716	0.010	600	9,042,304
Cover price (CHF)		17.727	18.241	0	3200	9,042,304
Age (monthly)		42.892	44.488	0	299	9,042,304
Paperback		0.232	0.422	0	1	9,042,304
Italian author		0.009	0.096	0	1	9,042,304
% of book titles also sold in IB	51%					
IB						
Unit sales		6.863	23.510	1	5773	3,189,405
Price (CHF)		25.536	19.156	1	598	3,189,405
Cover price (CHF)		16.102	14.468	0	1990	3,189,405
Age (monthly)		34.886	41.750	0	299	3,189,405
Paperback		0.247	0.431	0	1	3,189,405
Italian author		0.011	0.102	0	1	3,189,405
% of book titles also sold in CB+EC	93%					

Notes: The table reports summary statics of our dataset on book sales in Switzerland (overall, and by distribution channel). Data are at the ISBN, time (monthly) and channel (CB+EC, IB) level.
Source: Authors' calculations based on the GfK POS data.

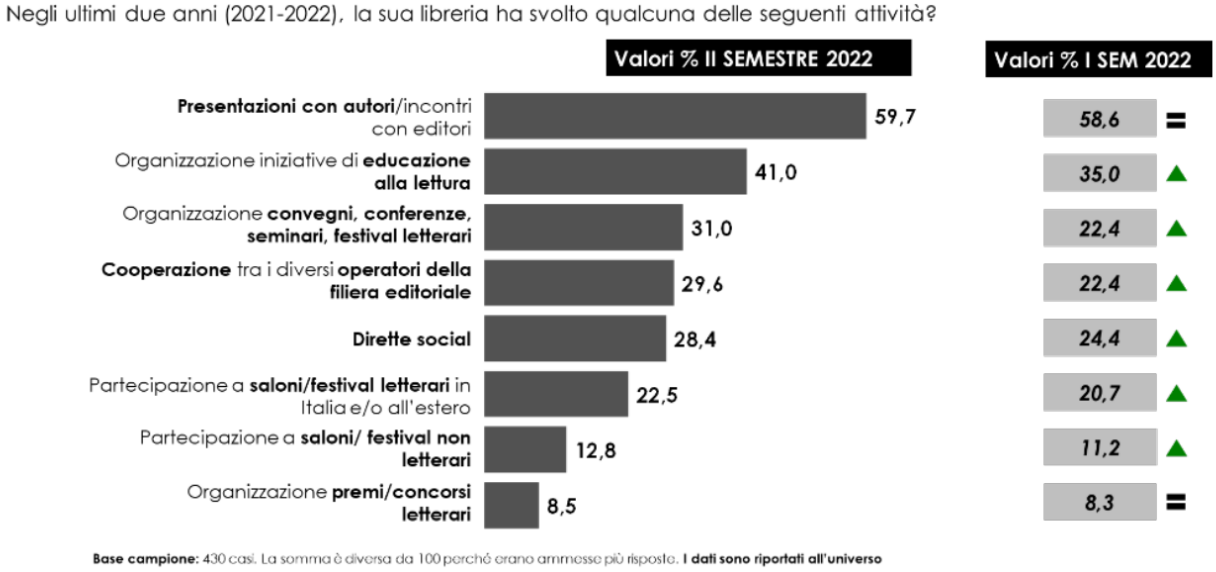
[46] The full survey (in Italian) is available here.

TABLE B2: SUMMARY STATISTICS FOR EMPLOYMENT AND FIRM DATA

Variable	Mean	Std. Dev.	Min	Max	Obs
Total					
Employees	7526.44	9359.21	877	26076	48
Number of firms	4524.56	7245.05	84	22097	48
1 employee					
Employees	12268.92	10295.82	2388	22633	12
Number of firms	11903.75	10063	2212	22097	12
2-5 employees					
Employees	14642.67	10558.43	3958	26076	12
Number of firms	5906	4433.87	1482	10610	12
6-9 employees					
Employees	1421.92	457.65	877	2016	12
Number of firms	188.92	64.05	114	274	12
>9 employees					
Employees	1772.25	145.62	1492	1966	12
Number of firms	99.58	11.56	84	116	12

Notes: The table shows summary statistics for employment and number of active firms in the bookshop and stationery retail sectors, as identified by their ATECO code, for the period 2009-2014. The data are further disaggregated by firm size, as measured by the number of employees. There are four size classes: 1 employee, 2-5 employees, 6-9 employees, and > 9 employees.
Source: Authors' calculation from the Italian Chambers of Commerce.

FIGURE B1: SURVEY AMONG ITALIAN BOOKSHOPS ABOUT THE INITIATIVES THEY ARE INVOLVED IN



The data used for the analysis of bookstore reviews and ratings is obtained from multiple sources. First, we acquired a list of active bookshops from illibraio.it, a website owned by one of the main Italian publishers (GeMS), which include reliable information on bookshops' name and address. This list contains 2,350 bookstores. As chain bookshops display regularities in their names, we were able to distinguish independent bookshops (IB) from chain bookshops (CB). Overall, 24% of bookstores in our sample are CB, while 76% are IB.

Second, for each bookstore in our sample, we collected ratings and reviews from Google Reviews. The scraping process was run in September 2024. We obtained up to 6,000 reviews for each bookshop, spanning over 8 years since the scraping date. For each review, we observe the name of the reviewer, a 0-5 rating score, and a text (when present). We performed a basic cleaning by dropping observations with no ratings, as well as bookshops with less than 10 reviews.[47] Overall, we obtained a dataset of more than 500,000 reviews coming from 372,000 different individuals, which implies that the median reviewer left just one review. On average, bookshops have 260 reviews each. CB receive more reviews than IB (520 reviews on average for CB, while IB have 171), consistent with the fact that CB are usually larger stores compared to IB. However, since there are more IB than CB, the total number of reviews is well-balanced across the two categories.

60% of the individuals left only a rating score, while there are around 213,000 proper reviews with text. We focused on these to find the key topics discussed in the reviews, using ML language models, as described in Appendix C. We find that 82% of the text reviews mentioned one of the key topics previously identified. As the same review can discuss many topics – the average number of topics included in a review is 6, the topic-level dataset expands accordingly. The final topic-level dataset includes 1 million topic-per-review observations. We then associate a sentiment score to each observation to determine positive, negative, or neutral sentiments toward each topic.

Table B3 reports summary statistics of the dataset used for the analysis of customer reviews of bookshops in Section 6.

Figure B2 plots the difference in review ratings of bookshops over time. Time 0 identifies the time when reviews were scraped (September 2024), but the review could have been written several years before. We can analyse reviews up to 2016 (Google Reviews were launched in Italy in 2014, and early data are very scarce). The figure shows that the difference in ratings between IB and CB has been persistent over time.

Figure B3 shows the distribution of sentiments across topics, which generates the results reported in Table 12. Notice that, for nearly every topic, the distribution for IB dominates – in the sense of stochastic dominance – that for CB. The only distribution that is nearly identical is that for prices.

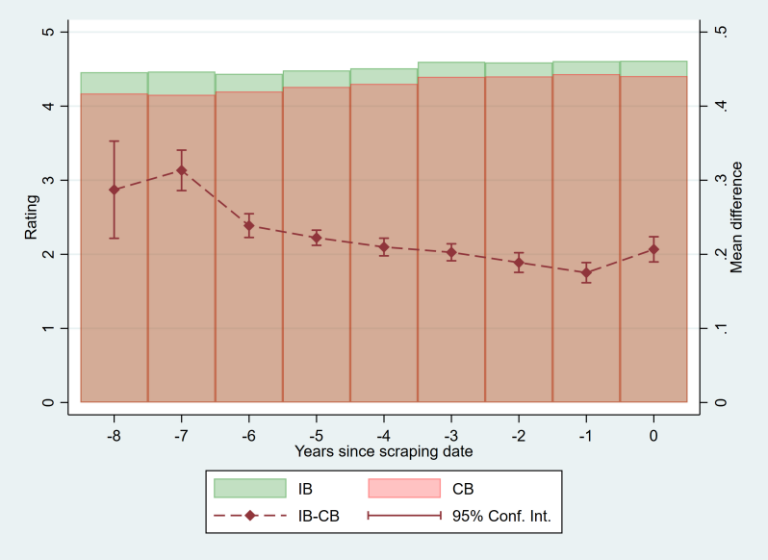
[47] This results in dropping around 5% of bookshops.

TABLE B3: TOPIC AND SENTIMENT SCORES SUMMARY STATISTICS

Topics	Number of reviews			Percentage of reviews		
	Negative	Neutral	Positive	Negative	Neutral	Positive
Staff						
The role of staff in helping clients: Advice by staff	4967	1528	53252	8%	3%	89%
The role of staff in helping clients: Courtesy of staff	5412	2097	55108	9%	3%	88%
The role of staff in helping clients: Friendly staff	5407	4223	77764	6%	5%	89%
The role of staff in helping clients: Helpful staff	5154	2826	74388	6%	3%	90%
The role of staff in helping clients: Professional/expert staff	5018	1408	52511	9%	2%	89%
The role of staff in helping clients: Quality of the service	5621	2164	55245	9%	3%	88%
The role of staff in helping clients: Suggestions by staff	4953	1434	52523	8%	2%	89%
Product discovery						
Product discovery: Availability of (new) authors	6409	13793	48279	9%	20%	70%
Product discovery: Availability of books	9799	6354	86818	10%	6%	84%
Product discovery: Availability of classics	8544	11090	70155	10%	12%	78%
Product assortment						
Product assortment: Products difficult to find	1672	917	3535	27%	15%	58%
Product assortment: Specialist products available	1916	1893	24594	7%	7%	87%
Product assortment: Well-stocked or organised bookshop	9412	9784	110881	7%	8%	85%
Organization of events						
Organization of events: Availability of armchairs or sofas	631	1533	1855	16%	38%	46%
Organization of events: Availability of coffee shop	4793	4413	16014	19%	17%	63%
Organization of events: Meetings with authors or publishers	4250	4510	11855	21%	22%	58%
Organization of events: Reading groups availability	5550	4780	16385	21%	18%	61%
Pricing						
Pricing: Availability of discounts	3266	2183	9186	22%	15%	63%
Pricing: Buy one get one free or half-price offers	3264	3213	7242	24%	23%	53%
Pricing: Cheap or expensive prices	3495	2022	7565	27%	15%	58%
Pricing: Reduced or discounted prices	2979	1805	9333	21%	13%	66%

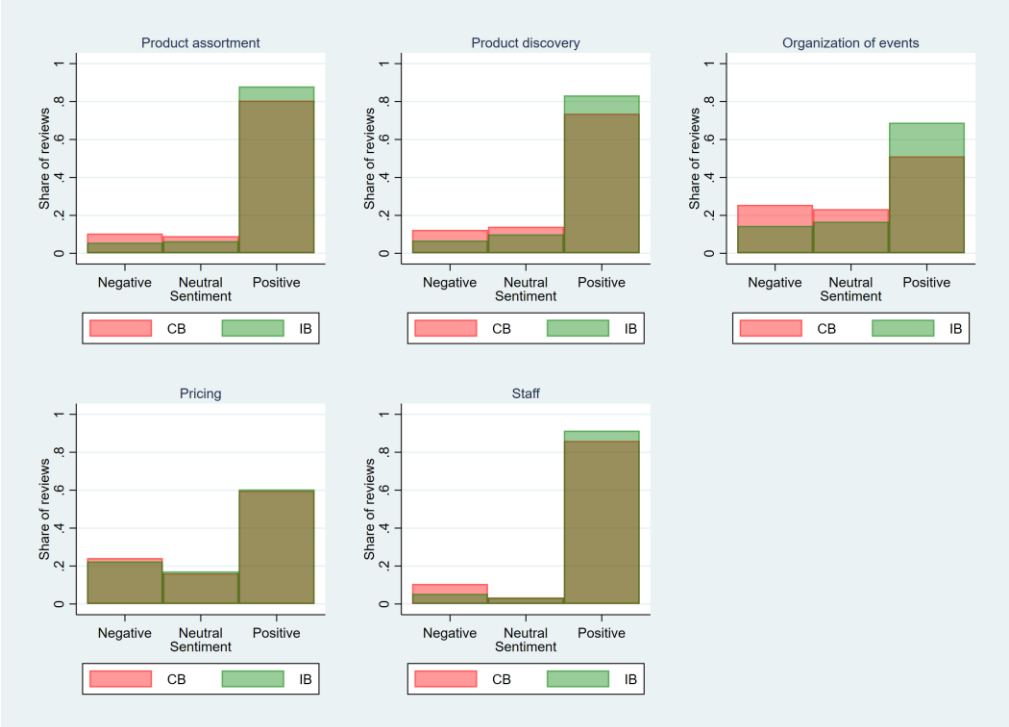
Notes: The table reports the distribution of reviews across topics and sentiment scores. Topic definition and methodology for review allocation are described in Appendix C.
Source: Authors' calculation from Google Reviews on a sample of more than 2,250 bookshops in Italy.

FIGURE B2: DIFFERENCE IN MEAN RATINGS OVER TIME



Notes: The figure shows the evolution of mean rating over time. The left-hand side y-axis measures mean ratings for independent (IB) chain (CB) bookshops. The right-hand side y-axis shows the difference in the average score between IB and CB. Date 0 is the scraping date (September 2024).
Source: Authors' calculation from Google Reviews on a sample of more than 2,250 bookshops in Italy.

FIGURE B3: SENTIMENT OVER TOPICS



Notes: The figure shows the distribution of sentiment scores for five macro-topics described in Table B3, separately for independent (IB) chain (CB) bookshops. Topic definition and methodology for review allocation are described in Appendix C.
Source: Authors' calculation from Google Reviews on a sample of more than 2,250 bookshops in Italy.

Appendix C

C.1 Methodology for the identification of Italian authors

We describe the machine learning (ML) model used to predict whether authors are Italian, based on their names. We use two distinct datasets, one for the Italian book market, and one for the Swiss market. Each of these is separately used for both training and prediction. We use 80% of data for training the model, and 20% for testing it. The algorithm is then organized in three steps. First, it is trained on a subset of the data. Second, after training the model, we test its accuracy on another small sub-sample of the data. Third, we apply the prediction model to the entire set of authors in the datasets. Each of the three steps is run separately in the Italian and Swiss datasets.

More in detail, we start by creating an "Italian" identifier for a subset of authors in our datasets. For both the Italian and Swiss dataset, we selected a 14% random sample from the full list of authors. Then, we manually generated a dummy that identifies Italian authors in the sample. This information feeds the algorithm, allowing the ML model to learn which names are Italian and which are not.

Each author's name can be seen as a collection of terms. We use Python's TfidfVectorizer to compute *term-frequency-inverce-document-frequency* (tf-idf) scores associated to each term in authors' name. The tf-idf score measures how important each term is based on its frequency in the name and across the entire dataset. During the training phase, a logistic regression model assigns weights to terms. Each weight represents the importance of each term in determining whether an author is Italian or not. The model predicts the log-probability that an author is Italian using the following regression:

$$\hat{y} = w_0 + \sum_{i=1}^{n} w_i x_i,$$

where w_i are the weights associated to each term and x_i are the tf-idf scores for each term in the name. The estimated $\widehat{w}_i$ are then used to predict the likelihood that an author is Italian:

$$P(y = 1|x_1, x_2, \dots, x_n) = \frac{1}{1 + e^{-(\sum_{i=1}^{n} w_i x_i)}}$$

If the likelihood is greater or equal than 50%, the model identifies the author as Italian. The precision of the model is 94% in the Italian dataset, and 96% in the Swiss dataset.

C.2 Topic and stance detection methodology

In our analysis of bookstore reviews in Section 6, we implemented a systematic approach to detect topics discussed by customers and assess their sentiments toward these topics. The methodology consists of two main steps: topic detection and stance detection.[48]

We began by defining a comprehensive set of topics relevant to customer experiences in bookstores. These topics were specified with expanded clarity to capture nuanced aspects, such as:

- *The role of staff in helping clients*: Helpful staff, Friendly staff, Professional/expert staff, Quality of service, Courtesy of staff, Advice by staff, Suggestions by staff.

[48] We thank Prashant Garg for implementing this procedure, which draws on Garg and Fetzer (2024).

- *Product discovery*: Availability of books, Availability of (new) authors, Availability of classics.
- *Pricing*: Cheap or expensive prices, Availability of discounts, Reduced or discounted prices, Buy one get one free, Half-price offers.
- *Product assortment*: Well-stocked or organized bookshop, Products difficult to find, Specialist products available.
- *Organization of events*: Meetings with authors or publishers, Reading groups availability, Availability of coffee shop, Availability of armchairs or sofas.

To build topic-term dictionaries, we utilized GPT-4o, a large language model developed by OpenAI, to generate relevant unigrams, bigrams, and trigrams for each topic. For instance, prompts like "Provide a list of bigrams related to the topic of Friendly staff" were used. This process ensured a rich set of terms associated with each topic.

The customer reviews were then pre-processed by converting text to lowercase, removing non-alphabetic characters, and applying lemmatization to standardize word forms. Using the topic-term dictionaries, we classified reviews by checking for the presence of any topic-specific terms within the text. A review was labelled with a topic if it contained any associated terms, allowing for multiple topics per review when applicable.

For reviews identified with specific topics, we conducted stance detection to determine the sentiment expressed by the reviewer toward each topic. We employed OpenAI's GPT-4o-mini model for this task, balancing efficiency and performance for large-scale data.

The model was prompted to classify the sentiment as 'positive', 'negative', 'neutral', or 'unrelated', based on the review content related to the given topic. The prompt provided both the topic and the review text to give context, structured as follows:

"*You are tasked with analyzing customer reviews for sentiment towards specific topics. For each review provided, determine the sentiment of the review writer towards the given topic. Classify the sentiment as one of the following options: 'positive', 'negative', 'neutral', or 'unrelated'. Only respond with the sentiment label without any additional text.*

Topic: '<topic>'

Review: '<review_text>'

What is the sentiment of the review writer towards the topic?"

We processed the reviews in batches to optimize resource utilization and manage API constraints. The model's responses were parsed to extract sentiment labels, which were then merged back into the main dataset.

After obtaining sentiment labels for each topic within the reviews, we calculated sentiment scores by aggregating the counts of each sentiment category per topic. Reviews labelled as 'unrelated' were excluded to focus on pertinent sentiments. This enabled us to compute the proportion of reviews expressing positive, negative, or neutral sentiments toward each topic, offering insights into customers' perceptions of various bookstore aspects.

The final dataset integrates the original reviews, detected topics, and corresponding sentiment classifications.

Appendix D

This appendix reports all the demand estimations leading the robustness checks conducted in Section 5.4.

TABLE D1: ROBUSTNESS OF DEMAND ESTIMATION (ALTERNATIVE IVs)

	(1)	(2)	(3)	(4)	(5)
Model	OLS Logit	IV Logit	NL book	NL channel	NL Genre IV
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.009***	-2.934***	-2.969***	-0.979***	-0.951***
	(0.000)	(0.179)	(0.182)	(0.063)	(0.061)
Group segment parameter (σ_g)			-0.588**	0.738***	0.824***
			(0.269)	(0.009)	(0.010)
Book age	-0.017***	-0.060***	-0.059***	-0.019***	-0.017***
	(0.000)	(0.003)	(0.003)	(0.001)	(0.001)
Paperback edition	3.352***	-17.276***	-17.482***	-6.009***	-6.108***
	(0.026)	(1.273)	(1.292)	(0.437)	(0.423)
Big publisher	2.476***	4.124***	3.941***	1.200***	0.970***
	(0.015)	(0.207)	(0.226)	(0.077)	(0.076)
Post × IB indicator	0.216***	1.827***	1.799***	0.503***	0.564***
	(0.005)	(0.112)	(0.115)	(0.040)	(0.039)
Post	0.054***	-0.488***	-0.468***	-0.179***	-0.215***
	(0.006)	(0.049)	(0.051)	(0.017)	(0.016)
IB channel indicator	-1.362***	2.488***	1.293**	0.272***	1.010***
	(0.005)	(0.246)	(0.606)	(0.085)	(0.080)
Observations	29,053,247	29,053,247	29,053,247	29,053,247	29,053,247
Clusters (ISBN)	522,017	522,017	522,017	522,017	522,017
Instruments		Number of top 100 books released each month for the last five months	Number of top 100 books released each month for the last five months	Number of top 100 books released each month for the last five months	Number of top 100 books released each month for the last five months
First stage F-test (price)		93.85	106.81	67.82	65.97
p-value		[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)			56.62	374.07	364.36
p-value			[0.000]	[0.000]	[0.000]
Number of books with inelastic demand	99.55%	0.02%	0.00%	0.00%	0.00%

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS data.

TABLE D2: ROBUSTNESS OF DEMAND ESTIMATION (DROPPING ISBNs WITH EVEN LAST DIGIT)

	(1)	(2)	(3)	(4)	(5)
Model	Drop ISBNs with last digit 0	Drop ISBNs with last digit 2	Drop ISBNs with last digit 4	Drop ISBNs with last digit 6	Drop ISBNs with last digit 8
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.662***	-0.496***	-0.624***	-0.470***	-0.694***
	(0.045)	(0.036)	(0.044)	(0.035)	(0.046)
Group segment parameter (σ_g)	0.441***	0.508***	0.415***	0.530***	0.460***
	(0.015)	(0.012)	(0.014)	(0.011)	(0.015)
Book age	-0.019***	-0.015***	-0.019***	-0.015***	-0.019***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Paperback edition	-2.745***	-1.816***	-2.410***	-1.716***	-3.036***
	(0.287)	(0.226)	(0.279)	(0.222)	(0.291)
Big publisher	1.738***	1.488***	1.797***	1.438***	1.724***
	(0.070)	(0.056)	(0.069)	(0.055)	(0.073)
Post × IB indicator	0.490***	0.383***	0.466***	0.359***	0.501***
	(0.031)	(0.024)	(0.029)	(0.023)	(0.031)
Post	-0.111***	-0.097***	-0.100***	-0.088***	-0.135***
	(0.011)	(0.009)	(0.011)	(0.008)	(0.012)
IB channel indicator	0.086*	-0.021	0.022	-0.029	0.176***
	(0.049)	(0.039)	(0.048)	(0.038)	(0.051)
Observations	26,145,479	26,140,719	26,137,158	26,154,563	26,144,562
Clusters (ISBN)	469,699	469,762	469,740	469,769	469,876
Instruments	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months
First stage F-test (price)	103	100.52	102.79	95.79	106.03
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)	198.3	174.86	187.39	166.27	197.73
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS data.

TABLE D3: ROBUSTNESS OF WELFARE CALCULATIONS (DROPPING ISBNs WITH EVEN LAST DIGIT, in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
Drop ISBNs with last digit 0	Substitution effect only	2,320	2,359	-39	-1.7%
	Effort effect only	2,445	2,320	125	5.1%
	Total welfare effect	4,764	4,679	86	1.8%
Drop ISBNs with last digit 2	Substitution effect only	3,320	3,355	-35	-1.1%
	Effort effect only	3,420	3,320	99	2.9%
	Total welfare effect	6,740	6,676	65	1.0%
Drop ISBNs with last digit 4	Substitution effect only	2,849	2,889	-40	-1.4%
	Effort effect only	2,971	2,849	121	4.1%
	Total welfare effect	5,820	5,738	81	1.4%
Drop ISBNs with last digit 6	Substitution effect only	3,467	3,500	-33	-1.0%
	Effort effect only	3,559	3,467	92	2.6%
	Total welfare effect	7,025	6,967	59	0.8%
Drop ISBNs with last digit 8	Substitution effect only	1,945	1,984	-39	-2.0%
	Effort effect only	2,072	1,945	127	6.1%
	Total welfare effect	4,016	3,929	88	2.2%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discusses in section 5.3 of the paper. The different rows correspond to columns 2, 4 and 5 of Table 6.
Source: Authors' calculations based on the GfK POS data and the estimated results from Table 6.

TABLE D4: ROBUSTNESS OF DEMAND ESTIMATION (DROPPING DIFFERENT GENRES)

	(1)	(2)	(3)	(4)	(5)
Model	Drop genre IV category 1	Drop genre IV category 3	Drop genre IV category 7	Drop genre IV category 11	Drop genre IV category 22
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.499***	-0.510***	-1.427***	-0.407***	-0.564***
	(0.035)	(-14.49)	(-14.57)	(-12.01)	(-15.19)
Group segment parameter (σ_g)	0.468***	0.471***	0.396***	0.492***	0.486***
	(0.012)	(38.80)	(20.02)	(39.71)	(36.38)
Book age	-0.017***	-0.016***	-0.024***	-0.017***	-0.017***
	(0.001)	(-23.48)	(-19.15)	(-20.54)	(-22.59)
Paperback edition	-1.629***	-1.850***	-7.792***	-1.053***	-2.513***
	(0.218)	(-8.17)	(-12.08)	(-5.24)	(-9.93)
Big publisher	1.534***	1.625***	2.516***	1.441***	1.413***
	(0.052)	(27.29)	(18.45)	(27.79)	(25.06)
Post × IB indicator	0.387***	0.397***	0.826***	0.329***	0.418***
	(0.023)	(16.57)	(14.65)	(14.64)	(16.31)
Post	-0.079***	-0.091***	-0.262***	-0.070***	-0.107***
	(0.009)	(-10.30)	(-10.97)	(-8.85)	(-11.13)
IB channel indicator	-0.069*	-0.030	1.008***	-0.163***	0.037
	(0.039)	(-0.76)	(8.29)	(-4.51)	(0.93)
Observations	27,880,226	27,943,898	25,378,213	25,242,770	26,361,068
Clusters (ISBN)	500,556	504,184	451,282	456,420	468,837
Instruments	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months
First stage F-test (price)	110.78	113.49	104	91.19	108.82
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)	190.85	209.35	230.46	132.52	199.53
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS data.

TABLE D5: ROBUSTNESS OF WELFARE CALCULATIONS (DROPPING DIFFERENT GENRES, in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
Drop genre IV category 1	Substitution effect only	3,714	3,750	-36	-1.0%
	Effort effect only	3,817	3,714	103	2.7%
	Total welfare effect	7,530	7,464	66	0.9%
Drop genre IV category 3	Substitution effect only	3,499	3,536	-37	-1.0%
	Effort effect only	3,605	3,499	106	2.9%
	Total welfare effect	7,104	7,035	70	1.0%
Drop genre IV category 7	Substitution effect only	552	595	-42	-7.7%
	Effort effect only	736	552	184	25.0%
	Total welfare effect	1,288	1,147	142	11.0%
Drop genre IV category 11	Substitution effect only	4,912	4,944	-32	-0.7%
	Effort effect only	4,991	4,912	78	1.6%
	Total welfare effect	9,903	9,857	46	0.5%
Drop genre IV category 22	Substitution effect only	2,693	2,730	-37	-1.4%
	Effort effect only	2,803	2,693	110	3.9%
	Total welfare effect	5,496	5,423	73	1.3%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discusses in section 5.3 of the paper. The different rows correspond to columns 2, 4 and 5 of Table 6.
Source: Authors' calculations based on the GfK POS data and the estimated results from Table 6.

TABLE D6: ROBUSTNESS OF DEMAND ESTIMATION (DIFFERENT CONSTANTS ADDED)

	(1)	(2)	(3)	(4)	(5)	(6)
Model	Add 0.00001	Add 0.0001	Add 0.001	Add 0.01	Add 0.1	Add 1
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.562***	-0.586***	-0.600***	-0.585***	-0.494***	-0.253***
	(0.039)	(0.040)	(0.040)	(0.038)	(0.031)	(0.017)
Group segment parameter (σ_g)	0.528***	0.426***	0.281***	0.070***	-0.243***	-0.747***
	(0.011)	(0.013)	(0.016)	(0.019)	(0.020)	(0.018)
Book age	-0.018***	-0.018***	-0.019***	-0.018***	-0.016***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Paperback edition	-2.067***	-2.169***	-2.208***	-2.070***	-1.486***	-0.034
	(0.248)	(0.253)	(0.253)	(0.240)	(0.198)	(0.115)
Big publisher	1.698***	1.748***	1.784***	1.775***	1.641***	1.258***
	(0.061)	(0.062)	(0.062)	(0.058)	(0.047)	(0.025)
Post × IB indicator	0.434***	0.445***	0.448***	0.427***	0.349***	0.159***
	(0.026)	(0.027)	(0.026)	(0.025)	(0.020)	(0.011)
Post	-0.103***	-0.102***	-0.098***	-0.086***	-0.058***	-0.004
	(0.010)	(0.010)	(0.010)	(0.010)	(0.008)	(0.005)
IB channel indicator	-0.053	-0.019	0.020	0.058	0.078**	0.061***
	(0.042)	(0.043)	(0.044)	(0.043)	(0.037)	(0.022)
Observations	29,053,247	29,053,247	29,053,247	29,053,247	29,053,247	29,053,247
Clusters (ISBN)	522,017	522,017	522,017	522,017	522,017	522,017
Instruments	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months
First stage F-test (price)	109.73	113.31	120.43	136.3	176.7	281.33
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)	193.64	203.38	221.09	258.73	359.29	695.54
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS data.

TABLE D7: ROBUSTNESS OF WELFARE CALCULATIONS (DIFFERENT CONSTANTS ADDED, in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
Add 0.00001	Substitution effect only	2,514	2,540	-26	-1.0%
	Effort effect only	2,604	2,514	90	3.5%
	Total welfare effect	5,118	5,054	64	1.3%
Add 0.0001	Substitution effect only	3,158	3,197	-39	-1.2%
	Effort effect only	3,274	3,158	116	3.5%
	Total welfare effect	6,432	6,355	77	1.2%
Add 0.001	Substitution effect only	4,378	4,433	-55	-1.3%
	Effort effect only	4,522	4,378	145	3.2%
	Total welfare effect	8,900	8,810	90	1.0%
Add 0.01	Substitution effect only	7,124	7,197	-74	-1.0%
	Effort effect only	7,300	7,124	177	2.4%
	Total welfare effect	14,424	14,321	103	0.7%
Add 0.1	Substitution effect only	14,134	14,227	-93	-0.7%
	Effort effect only	14,322	14,134	189	1.3%
	Total welfare effect	28,456	28,360	96	0.3%
Add 1	Substitution effect only	45,806	45,956	-150	-0.3%
	Effort effect only	45,971	45,806	165	0.4%
	Total welfare effect	91,777	91,761	15	0.0%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discusses in section 5.3 of the paper. The different rows correspond to columns 2, 4 and 5 of Table 6.
Source: Authors' calculations based on the GfK POS and the estimated results from Table 6.

TABLE D8: ROBUSTNESS OF DEMAND ESTIMATION (BOUNDS APPROACH)

	(1)	(2)
Model	IV Logit	NL Genre IV
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-1.430***	-0.595***
	(0.075)	(0.004)
Group segment parameter (σ_g)		0.434***
		(0.001)
Book age	-0.041***	-0.015***
	(0.016)	(0.008)
Paperback edition	-6.457***	-2.261***
	(0.321)	(0.000)
Big publisher	3.275***	1.866***
	(0.232)	(0.000)
Post × IB indicator	0.974***	0.455***
	(0.248)	(0.000)
Post	-0.230	-0.062***
	(0.206)	(0.000)
IB channel indicator	0.473***	0.087***
	(0.247)	(0.003)
Observations	29,053,247	29,053,247
Clusters (ISBN)	522,017	522,017

Notes: All regressions include a full set of year, month and genre fixed effects. Standard errors are calculated based on a bootstrap procedure where we (1) draw with replacement randomly books with different last digit; (2) compute the bound estimator using that sample; (3) repeat steps (1)-(2) for n-times; (4) obtain the sample standard deviation of the different estimates. Standard errors are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.
Source: Authors' calculations based on the GfK POS data.

TABLE D9: FURTHER ROBUSTNESS OF DEMAND ESTIMATION

Model	(1) NL Genre IV minus 10% of potential market size	(2) NL Genre IV minus 20% of potential market size	(3) NL Genre IV More flexible specification	(4) NL Genre IV New books (first year of publication only)	(5) NL Genre IV Top selling books (above average sales)	(6) IV Logit Placebo Switzerland	(7) NL Genre IV Placebo Switzerland
Dependent variable	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$	$\ln(S_{jt})-\ln(S_{0t})$
Price	-0.570***	-0.512***	-0.585***	-0.997***	-0.514***	-0.108***	-0.056***
	(0.041)	(0.043)	(0.040)	(0.206)	(0.044)	(0.010)	(0.001)
Group segment parameter (σ_g)	0.357***	0.232***	0.426***	0.636***	0.404***		0.962***
	(0.014)	(0.015)	(0.013)	(0.054)	(0.014)		(0.002)
Book age	-0.019***	-0.020***	-0.018***	-0.003	-0.018***	-0.007***	-0.000***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.000)	(0.000)
Paperback edition	-1.826***	-0.993***	-2.157***	-5.864***	-1.757***	0.160	-0.595***
	(0.260)	(0.269)	(0.253)	(1.317)	(0.273)	(0.118)	(0.016)
Big publisher	1.909***	2.185***	1.913***	2.979***	1.290***		
	(0.064)	(0.066)	(0.060)	(0.499)	(0.049)		
Post × IB indicator	0.451***	0.445***	0.466***	0.542***	0.399***	-0.045***	0.024***
	(0.027)	(0.028)	(0.028)	(0.117)	(0.030)	(0.008)	(0.002)
Post	-0.092***	-0.068***	-0.103***	-0.354***	0.010	-0.150***	-0.059***
	(0.010)	(0.010)	(0.010)	(0.080)	(0.014)	(0.007)	(0.001)
IB channel indicator	-0.133***	-0.380***	0.050	0.859***	-0.950***	-0.577***	0.143***
	(0.044)	(0.045)	(0.041)	(0.201)	(0.048)	(0.033)	(0.006)
Post × IB indicator × Big publisher			-0.093***				
			(0.024)				
IB indicator × Big publisher			-0.330***				
			(0.033)				
Observations	29,053,247	29,053,247	29,053,247	4,142,338	15,470,492	43,560,544	43,560,544
Clusters (ISBN)	522,017	522,017	522,017	225,144	486,628	794,258	794,258
Instruments	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months	Number of books released each month for the last 5 months
First stage F-test (price)	99.22	113.31	113.23	12.31	346.52	365.50	365.50
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
First stage F-test (segment)	181.38	203.38	202.78	12.64	454.23	386.04	386.04
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes: All regressions include a full set of year, month and genre fixed effects. Sanderson-Windmeijer multivariate F test of excluded instruments with the p-values in square parentheses below are reported. Standard errors clustered at the book level to control for autocorrelation and heteroskedasticity are reported in parenthesis below coefficients: *significant at 10%; **significant at 5%; ***significant at 1%.

Source: Authors' calculations based on the GfK POS monthly retail data.

TABLE D10: FURTHER ROBUSTNESS WELFARE CALCULATIONS (in € m)

Model		(1) Observed	(2) Counterfactual	(3) Δ	(4) Δ%
minus 10% of potential market size	Substitution effect only	4,015	4,055	-41	-1.0%
	Effort effect only	4,134	4,015	119	2.9%
	Total welfare effect	8,148	8,070	78	1.0%
minus 20% of potential market size	Substitution effect only	6,387	6,430	-43	-0.7%
	Effort effect only	6,509	6,387	121	1.9%
	Total welfare effect	12,896	12,817	78	0.6%
More flexible specification	Substitution effect only	3,243	3,271	-28	-0.9%
	Effort effect only	3,348	3,243	105	3.1%
	Total welfare effect	6,591	6,514	77	1.2%
New books (first year of publication only)	Substitution effect only	402	432	-30	-7.5%
	Effort effect only	480	402	78	16.3%
	Total welfare effect	883	835	48	5.4%
Top selling books (above average sales)	Substitution effect only	3,871	3,874	-3	-0.1%
	Effort effect only	3,916	3,871	45	1.1%
	Total welfare effect	7,787	7,745	42	0.5%

Notes: The numbers in the table represent the calculation of consumer welfare (in € m) under different counterfactual scenarios as discusses in section 5.4 of the paper. The different rows correspond to columns 1 - 5 of Table D9.
Source: Authors' calculations based on the GfK POS data and the estimated results from Table D9.

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