Frictions in International E-Commerce
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Frictions in International E-Commerce\(^1\)

Abstract

- Online book prices in USA and Canada convincingly reject the Law of One Price.
- Relative competitiveness is almost completely determined by the exchange rate.
- We conclude that extant frictions prevent the integration of the two national markets. We look into the possible causes of such friction and find that international shipping costs appear to be the most important hurdle.

Key Results

- Frictions in Cross-border e-commerce are large enough to prevent the Law of One Price and market integration.

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Introduction

In 1995, The Economist published a survey article – “The Death of Distance” (The Economist 1995) – which predicted that because of the Internet, the transactions costs or frictions involved in doing international business would be significantly reduced in many industries. Six years later, the same magazine published a cover story – “The Internet’s New Borders” (The Economist 2001) – arguing that “Geography matters in the networked world, and now more than ever”. The differences in these articles reflect much of the changes in the discussion of international E-Commerce. Initial predictions of enhanced international commerce and increased globalization via the Information Superhighway have given way to skepticism about how “frictionless” the International e-commerce could become.

The issue of transactions costs has been a central part of the International Business literature. It is sometimes argued that the key difference between doing business in one country and many countries is the significantly increased transactions costs. In the standard IB context however, the discussion of transactions costs have usually revolved around the theory of the multinational, and in particular issues of international market entry, multinational firm size etc (for example Anderson and Gatignon 1986, and many others). International E-Commerce however presents a very different set of issues than the standard IB analysis. While the Internet may have reduced some barriers to International Business, other frictions may still remain. Determination of the existing frictions and their effect on international e-commerce, therefore, constitute an important research agenda.

In this paper we study the question of frictions in international e-commerce by examining the behavior of prices of identical products sold online by e-retailers in two different countries – in other words we test the Law of One Price (LOP) on the Internet. In a perfectly frictionless world where national markets are completely integrated and where a consumer is only “a click away” from purchasing foreign products, it may be argued that prices would tend to converge between sellers in different countries after adjusting for exchange rates. Difference in prices or significant variation in relative prices as a result of exchange rate movements, would indicate lack of market integration and the persistence of frictions in international business.

Using an innovative data collection methodology we build a unique dataset, drawing data directly from the web sites of the two companies. We build up a time series-cross section panel of the listed prices from each company for 3550 books, collected weekly for 57 weeks, resulting in a database of over 200,000 price observations for each store. A unique ISBN (International Standard Book Number) identifies each book. We thus have an opportunity to test the Law of One Price in
the case of a completely homogenous product—a situation difficult to come across in most such comparisons. This allows us to compare the prices of exactly identical products offered on two different websites, in two different countries.

The main results of the paper are as follows. In broad terms, the prices charged at the two sites are relatively close to each other once corrected for the exchange rate. However, statistically, these prices convincingly reject the Law of One Price. In the dynamic context too, book prices fail to adjust to exchange rate movements. We interpret this failing of the Law of One Price as evidence of frictions in international e-commerce—frictions probably arising from various kinds of transactions costs. We discuss some of the possible sources of such friction that may still be evident in this market.

**Motivation**

There is a vast literature on the Law of One Price in the “old economy” context—examining whether traditional markets in different countries are integrated or not (see Rogoff 1996). The overwhelming conclusion in this literature is that Law of One Price is rejected which implies that markets in different countries are not integrated, and that there are considerable frictions in crossing international borders. Froot, Kim, and Rogoff 1995, for instance, strongly reject the Law of One Price for numerous commodities using European data for over 700 years. They argue that the rejection of the Law of One Price is one of the “most striking empirical regularities” (Froot/Kim/Rogoff 1995, p.1). In a less rigorous way, the Economist’s regular MacPPP index also finds that the prices of MacDonald’s hamburgers vary considerably in different countries after accounting for exchange rates. An important reason for this widespread failure of the Law of One Price is the presence of transactions costs.

The prerequisites of the Law of One Price include the absence of transaction costs. It assumes that agents can actually carry out a profitable cross-border goods arbitrage and profit from them in case of divergence in the prices of a product in two countries. The presence of real life transactions costs, therefore, create a band around the price of a product in a country within which international arbitrage is not profitable and hence Law of One Price cannot hold. Such transactions costs can be notionally broken down into two categories—‘search costs’ and ‘fulfillment costs’. The former refers to the fact that customers in a country rarely have the information about a lower priced similar product in a foreign country and acquiring that information may be inordinately expensive particularly if the product in question is a retail item. The latter includes cross-border shipping, tariffs and customs and other costs that may add to the price of an imported good.
Another feature that may prevent the Law of One Price is international price discrimination by producers—i.e. charging different prices in different countries according to local elasticities of demand to maximize total revenue. However, this too has its roots in transactions costs. Price discrimination is viable only if markets can be effectively segmented so that a buyer in the higher-price market cannot access the cheaper market.

While both categories of transactions costs are important in the conventional "bricks-and-mortar" world, 'search costs' are minimal in the world of e-commerce. A Canadian customer, for instance, can compare prices of books (or several other products) at Amazon and Chapters with just a few clicks of her mouse—physical distance and national borders are completely irrelevant here. This leads to the question: do prices in an online environment, free of 'search costs', satisfy the Law of One Price. This is the subject of the present paper.

In order to investigate these issues we provide a clinical study of the pricing behavior for two competitors, each a leader of e-commerce in its own country, selling a common commodity (books) in two neighboring countries, Canada and the US. The companies are Amazon.com, the world leader in e-commerce from the US, and Chapters Online, the leading Canadian online vendor. Amazon.com is among the world’s largest Internet retailers and is almost synonymous with the idea of buying books online. Chapters Online is the leading online retailer in Canada across all product categories.

This case study is of particular interest because it focuses on an industry and a geographical area that would tend to have lower transactions costs than most others. The Canadian and US economies are highly integrated, with each being the other’s most important trading partner. For the most part, there are very few cultural differences between Americans and English-speaking Canadians. Furthermore, books constitute a product category with no quality difference and have been one of the most successful product categories to sell online. The setting therefore, is purportedly biased towards the Law of One Price. If the LOP is violated in such a favorable setting, it is likely to fail in almost all other contexts of international e-commerce.

**Chapters, Amazon and Online Book Retailing in Canada**

Chapters Online, the online counterpart of the leading Canadian book-chain Chapters Inc., dominates the online book-retailing segment in Canada. Started in April 1999, it has a customer base of over half a million consumers (Chapters Online 2000) and offers over 2.5 million titles for sale (Shaw 2000). It is also by far the largest online Canadian vendor across all product categories (Chapters Online...
2000). One of the major competitors of Chapters Online is the American firm, Amazon.com. Founded in 1994, Amazon is by far the world’s largest online bookseller. It has over 3 million titles on offer, which is approximately 15 times larger than any conventional bookstore (Hof 1998) and its revenues from books alone is far in excess of that of its nearest competitor, Barnes & Noble.com (various SEC filings (10-K) available at www.edgar-online.com).

Given their relative ages and sizes, Chapters Online is clearly the newer entrant into the Internet bookselling market, competing with a dominant incumbent Amazon. Nevertheless Chapters is competitive with Amazon particularly among Canadian consumers. According to a recent Internet survey of Canadian online shoppers, 26% bought from Chapters while only 5% bought from Amazon (Pollara 2000).

While the effects of international competition in online retailing may exist on both sides of the border, given the smaller size of Chapters and its exclusively Canadian name recognition as well as the powerful brand-name of Amazon on the internet, it is more likely that Canadian shoppers would compare prices at the two outlets than American consumers. Amazon is an international player with operations in Europe and Japan in addition to the US while Chapters is largely Canadian. This is indeed reflected in the fact that Amazon is among the most visited e-commerce sites in Canada while Chapters has attracted few visitors from the US (Mediametrix 2000). Therefore this study focuses on price competition in the Canadian market.

It may be relevant to emphasize here that online retailing is an extremely competitive area with very thin margins (see Rosen/Howard 2000) where ‘critical mass’ is the crucial determinant of success or failure. It is also an area with marked ‘winner takes all’ features as described in Shapiro and Varian (1999).

### Relationship to Previous Research

Online international competition among retailers is a recent phenomenon, as are most other e-commerce activities. This paper is among the first attempts to research this particular field. However, the area stands at the intersection of at least three broader areas, each of which has been widely researched in the past – international price and trade comparisons particularly in the US-Canada context; internationalization of retailing; and online retailing and e-commerce.

International price comparisons and the Law of One Price (or the related issue of purchasing power parity) have had a long and rich history in international economics research. Rogoff (1996) provides an excellent survey of this literature. In particular Isard (1977) finds that the “law of one price”, one of the most impor-
tant totems of international economics, is “flagrantly and systematically violated by empirical data”. More often than not, transaction costs, that prevent international arbitrage, are at the root of these deviations from the textbook approach to international trade. In a recent paper, Obstfeld and Rogoff (2000) show that transaction costs may hold the key to several major puzzles of international economics. In this paper we examine both of these issues – the validity of the law of one price and the nature of cross border transaction costs – in the context of e-commerce.

US-Canada comparison of prices and trade volume has been a widely researched area in international economics. McCallum (1995), by comparing trade flows across the US-Canada border to those within Canada, finds that the border acts as a significant barrier to trade, in spite of the Free Trade agreement and the close cultural ties between the countries. Engel and Rogers (1996) find higher cross-border variation than within-country variation in price levels for identical categories of goods implying a significant border effect in the determination of prices. Hellwell (1998) corroborates these US-Canada ‘border effect’ findings using a much more extensive database of trade, prices, capital market linkages and labor flows. In particular, he concludes that “there are effectively no short-run price-equalizing pressures across national borders, even at the shortest distances” (pp.68). We examine this issue specifically in the E-Commerce environment.

The retailing sector has traditionally been one of the most non-traded of industries by the very nature of its activity. Selling to customers in foreign countries has been, as Salmon and Tordjeman (1989) point out, “partial and marginal”. Before the advent of the Internet, all attempts at international expansion by a retailer necessarily involved either an alliance with a retailing chain abroad or heavy foreign direct investment. Nevertheless, Akehurst and Alexander (1995) find that there has been a rising trend in international retailing. Simpson and Thorpe (1995) and Williams (1992) provide surveys of the recent literature in the area. The most important reasons for the limited internationalization in the retailing sector are the large transaction costs, particularly search costs and shipping costs. This paper examines the nature of cross-border retailing in the online environment where search costs are expected to be significantly lower.

tion search cost in online shopping for a differentiated product. While most of the existing research in this new area has studied online retailing in a domestic setting, the present paper is among the first to take this line of inquiry to the international context.

Data and Data Collection

The data set we use in this paper comprises weekly observations on the prices of 3550 books from the two stores for a period of 57 weeks. Existing e-commerce research (see Bailey 1998 and Brynjolfsson/Smith 2000) has used much smaller databases to study online price competition. The data collected here come entirely from publicly available information on the Internet. The data collection technique is outlined below.

The product specifications for a book (i.e. the physical characteristics of a book) are completely captured by what is known as the International Standard Book Number or the ISBN of a book. The book market, therefore, provides us with a setting where the products being sold in the two countries in question are exactly identical – a feature that is difficult to obtain for most other product categories. In order to construct our dataset of books, we begin by building a sample of ISBNs obtained from an online book-selling site “even better.com”5 – a source independent of the two bookstores under study. From the list of books available at this site, we generate a large sample of ISBNs of books belonging to different subject categories using proportionate random sampling. This involves picking up the same proportion of books from each of the different categories provided by the site6. Such proportionate sampling leads to the sample being more representative of a heterogeneous population like that of books.

Next we use a ‘bot’ – a web based program specifically designed for this purpose – which automatically extracts the necessary information for each book in our sample from the two websites, once every week (every Monday night). Our data, therefore, is weekly in frequency and covers the period from March 20, 2000 to April 22, 2001. We select the 3550 books for which data is available for all variables over the entire 57 week time period.

Prices at Amazon and Chapters cannot be compared without converting them to a common currency. We obtain the weekly Canadian Dollars – US Dollars exchange rate from OANDA (www.oanda.com) and use these figures to convert the Amazon prices to Canadian Dollars.

Both stores use incentives and follow “loyalty causing strategies” to lead to more return purchases. During the period under study Chapters used a “Chapters Club” program where members get a discount on their purchases. Amazon used promotional offers, gift certificates on selected products. While such programs
may have some impact on effective prices, we do not consider them here as they are not universal in scope and it is not possible to estimate the effective price without knowing the details of individual sales. One thing is clear though. Such incentives are not biased to favor domestic customers over foreign customers and hence do not affect cross-border price comparisons.

Data Analysis and Results

The focus of our study in this paper is the extent to which Law of One Price (LOP) holds in the world of e-commerce. For this purpose, we compare both the price levels (in Canadian Dollars) at the two online retailers as well as study the evolution of these prices over the time period under consideration.

Price levels and the LOP

A standard way to test the presence of the Law of One Price is to regress the prices on one another and test if the coefficient is significantly different from unity (see Miljkovic 1999). We begin our analysis, therefore, by regressing the Chapters price on the Amazon price using the entire 200,000 plus observations for each variable in our sample. The choice of the dependent variable is motivated by the notion that Chapters is a significantly smaller competitor from a smaller country competing against the world leader in the industry. Our conclusions, of course, are invariant to the choice of the dependent (and independent) variable.

The estimated coefficient of Amazon price (in Canadian dollar terms) is 0.91. Because of the extremely large sample in this regression, the t statistic for this coefficient is very large (2034). The 95% confidence interval for this estimate is (0.913, 0.915). A likelihood ratio test rejects the hypothesis of the coefficient being equal to 1.0 at a 1% level. Thus there is clear statistical evidence of violation of Law of One Price in our data indicating the presence of frictions in international online retailing.

Figure 1 presents a scatter plot of the average price (average over 57 weeks) for the books in our sample at the two online retailers. It essentially provides a visual representation of the regression finding described above. Under the assumption of the Law of One Price, the book prices should have been along the 45° line (the dotted line in the figure). The figure shows that while the prices of the books in the two countries clusters around the 45° line, the regression line actually deviates significantly from the 45° line illustrating the violation of the Law of One Price.
In order to get a better sense of the distribution of the relative book prices in the sample, we next present a histogram of the distribution in Figure 2. Here we obtain the relative book prices by dividing the average price (over 57 weeks) at Amazon (converted to Canadian dollars) by the average price at Chapters. A relative price of 1.0 indicates the Law of One Price in action. Removing a few (34) outliers to get a better visual sense of the distribution, we then create the histogram in Figure 2. The histogram reveals significant variation in relative book prices (the range of relative book prices in the entire sample is from 0.19 to 4.6). Thus, there are, in fact, books for which the average price in one online store is over four or five times that in the other. Also the distribution of relative prices is positively skewed suggesting that, while Chapters charges a small premium on most books, it also sells some books at large discounts as compared to Amazon.

Dynamics Over Time

While the absolute Law of One Price is statistically rejected by our sample, it is important to look at a relative version of the LOP as well. If the Law of One Price held in a relative sense, then this would mean that prices in the two stores would adjust to any changes in the exchange rate so as to keep the relative prices constant (even if not at unity). In other words, the "real exchange rate" for books between Canada and the USA should remain constant and variations in the US-
Figure 2. The Distribution of Relative Prices between Amazon and Chapters

Canada exchange rate should not have a prominent impact on it. The key question here is to what extent book prices react to changes either in the international competitor’s price or in the exchange rate.

Figure 3 presents the data on the movement in the relative price of books at the two stores (Amazon price in Canadian dollars divided by the Chapters price). Because we are studying the temporal characteristics of the data here, we use average book prices (average for the 3550 books in our sample) for both stores for every week in order to compute the relative prices. The US-Canada exchange rate (US$ per C$) is also plotted in the same figure. During the period under study both variables experience variations close to 10% of their mean value. Thus the relative prices are far from constant. Nor are their movements independent of the exchange rate movements – a corollary of the Law of One Price. The extent of co-movement between the two variables is evident from the figure. The correlation between them is over 0.93 and when used in a regression, exchange rate movements account for about 87% of the temporal variation in relative book prices. This is clear evidence that Law of One Price does not hold even in a relative sense in the world of international online retailing. Book prices are clearly far more ‘sticky’ than the exchange rate even in the online environment where one would expect significantly reduced menu costs and hence prices to be more responsive to the exchange rate.
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Figure 3. Movements in Relative Price and Exchange Rate (57 Weeks)

Price Changes in the Two Stores

In an integrated market, competing sellers are likely to react to one another's price changes. By this token if the online book retailing markets in the US and Canada are integrated, we should expect to see price movements by one seller in response to the other. Since Amazon is clearly the market leader, it is logical to expect that Chapters would exhibit some price-following behavior in response to changes made by Amazon. This is particularly true because price changes are much simpler to execute in online retailing. As opposed to the bricks and mortar stores all that an online vendor needs to change the price of a book is to change a number in a database. In other words, menu costs are thought to be significantly lower.

In this sub-section, therefore, we study the price changes made by the two online competitors in our sample. The aim is to examine, for each of the books, how often prices are adjusted and if there is a relationship between these adjustments. For these calculations we use raw nominal prices of each book in each country rather than an exchange rate adjusted price for one of the countries. This is because the multiplication of a price by the flexible exchange rate will distort any measure of price adjustment or volatility over time.

Table 1 shows the changes made in book prices at the two stores over the 57 weeks under consideration at the two stores. For approximately half of the 3550
books examined, if one of the stores has changed its price the other store had not changed its price. In 36% of the books, Amazon has changed its price and Chapters has not, and in 13% of the books, Chapters has changed its price and Amazon has not. There is thus no price-following pattern in the data. Also Chapters appears to be changing prices much less than Amazon does. This is in clear contradiction of the hypothesis that Chapters is a price follower since in that case Chapters would be reacting not only to Amazon’s price changes but also to changes in exchange rate leading to more changes in Chapters prices than in Amazon prices.

It is, however, conceivable that Chapters is following a complicated price follower strategy under which it changes prices of some other books in response to Amazon’s price changes. In order to study this possibility, we compute the coefficient of variation (standard deviation/mean) for each book in the two stores over the 57 weeks. The average of these 3550 coefficients of variation turns out to be 3.9% for Amazon while for Chapters it is less than 1.9%, i.e. less than half the figure of Amazon’s. The correlation between them is less than 0.11. Clearly then Chapters does not even respond significantly, to most price changes at Amazon, not to speak about responding to exchange rate changes. The analysis of price changes in the two stores clearly reveals the lack of leader-follower relationship between the two stores, at least in prices.

To sum up, the key results from our analysis of the book prices are as follows. We find that the Law of One Price is clearly violated in book prices at the two major online retailers in two countries with the best chances for market integration. The real exchange rate in terms of books, or the common currency relative price is far from constant with its variations almost entirely explained by exchange rate movements – further proof of the violation of Law of One Price and hence lack of market integration. Finally, there is no evidence of price leadership between the two leading competitors, further confirming the finding of lack of market integration.

Table 1. Price Setting Behaviors in the Two Online Stores

<table>
<thead>
<tr>
<th></th>
<th>Amazon No Price Change</th>
<th>Amazon Some Price Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Price Change</td>
<td>972 Books (27.3%)</td>
<td>1303 Books (36.7%)</td>
</tr>
<tr>
<td>Chapters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some Price Changes</td>
<td>469 Books (13.2%)</td>
<td>803 Books (22.6%)</td>
</tr>
</tbody>
</table>
Possible Sources of Friction

The preceding section establishes that the Law of One Price is violated in the US-Canada online book retailing industry indicating that the two markets are not integrated, presumably because of transactions costs and frictions that have traditionally prevented the integration of national markets in the “old economy”. The view that the online environment would render such transaction costs completely ineffective, if not totally eliminate them, is clearly not borne out by our data. In this section we describe some of the possible sources of such friction that still presents barriers to cross-border E-Commerce.

Shipping Costs

A key element of the new economy is the very “old economy” notion of getting the product shipped to the final consumer. An examination of both the Amazon and Chapters web sites indicates that shipping costs are a key area where national borders do indeed matter for E-commerce. In 2001, in order to ship one book from Amazon to a US customer the cheapest price is U$3.99, but to ship that same book to a Canadian customer the cheapest cost is U$5.48 (or approximately C$8.22 in Canadian dollars). For a Canadian customer to purchase one book from Chapters the price is C$ 5.40. Thus for a Canadian consumer the price of shipping one book is C$2.82 cheaper if the book is shipped from the Canadian store rather than the US competitor.

The existence of this shipping cost premium of C$2.82 clearly gives Chapters an advantage in selling to Canadians. It should be pointed out, however, that the shipping cost differential of C$2.82 is relatively small relative to the average Chapters book price of approximately C$46.00 (i.e. approximately 6% of the average purchase price). In essence, Chapters does have a competitive “buffer” against Amazon because of the shipping cost differential, but this is a relatively small buffer. At the same time, the relatively small size of the shipping cost differential (on average 6% of the average Chapters price) may explain why Chapters feels it has to price many of its books broadly in line with the Amazon price, particularly if online shoppers fail to notice the shipping cost differential.

Morwitz et al. (1998) demonstrate that buyers routinely underestimate partitioned prices (i.e. an extra price such as a shipping cost). To what extent this is true online, particularly given that shipping costs are often revealed at a much later stage in the buying process, remains an interesting empirical question. However, our data suggests that Chapters is hesitant to take advantage of the full “buffer” it enjoys, perhaps because of this reason.
Consumer Search Costs

Another transaction cost that has been thought to influence pricing behavior on the Internet is the notion that for a consumer shopping on the internet, the comparison of prices between different competitors is only "a click away", even though the competitors may be in different countries. It is this idea that search costs have become very small for consumers, that has driven the prediction of "frictionless" e-commerce where a firm could not afford to charge a price that was higher than its competitor.

Recent research on consumer behavior on the Internet has examined the issue of whether or not consumers actually do search for multiple prices before making a purchase. Johnson et al. (2001) have provided data that consumers in their sample only visit on average approximately 1.1 internet bookstores. They explain this by arguing that consumers, after a while, learn about a particular store or layout of that store on line and then return again and again to that store. If this hypothesis is correct for a proportion of consumers then there may be less pressure for storeowners to rapidly adjust prices for every book when the price changes at the competitor store. In our context, for instance, experienced Canadian online shoppers may not compare prices at Amazon, if they have found that prices on average in the past have been more or less comparable.

However, given that a store does not know how many people may follow this non-searching behavior, and how many may indeed search for the best price, it would seem consistent with the observed pricing behavior that prices are broadly in line on average. There is also the possibility that a few sophisticated online shoppers may even be using "shop-bots" that automatically hunt for best bargains, though international shop-bots are still hard to come by. Thus divergence from Law of One Price, though clearly present, is unlikely to exceed a reasonable level.

Menu Costs

A related transaction cost that was thought to disappear with the advent of e-commerce are menu costs. These are simply the costs involved in changing the prices displayed to the consumer. In a perfectly frictionless world where each store would rapidly adjust prices in response to any change in the competitor’s price, or even the exchange rate, menu costs would be assumed to be very low. Indeed, menu costs are likely to be much lower for online vendors than their traditional counterparts and it is even possible to have the prices programmed in such a manner that they automatically adjust to the competitor’s moves and other factors. Nevertheless, with a store selling products such as books, with millions of different prices to adjust, widespread price revisions may indeed be far from costless.
It is interesting to note that of the 3550 books in our sample, Amazon changed the price at least once of 64% of the books over the course of 57 weeks, while Chapters changed the price at least once of only 40% of the same books over the 57 weeks. These data have a number of interesting implications.

If it is argued that Chapters is a much smaller store that is based only in the Canadian market, and is attempting to halt the increased sales of its much larger American based competitor, then one would expect that Chapters would have to be particularly responsive to changes in price by Amazon. Furthermore, it can be argued that Chapters will also have to respond to any shifts in the US Canadian exchange rate. For all of these reasons, therefore, one would expect that Chapters would adjust its prices much more readily than Amazon.

One possible reason for why Chapters in fact does not adjust its prices as much as Amazon is that for a smaller store such as Chapters it does not have the resources to rapidly adjust all the prices that its competitors adjust. If this where indeed the case then it could indicate that menu costs may not in fact be irrelevant for E-Commerce. Of course, as discussed above, it is also possible that Chapters does not adjust its prices as often as Amazon because it has a shipping cost differential in its favor – as discussed above. Given the nature of our data, it is not possible to make a definitive statement on this issue. However this issue is clearly an important topic of further research.

Protectionist Barriers – No Longer a Barrier on the Internet

Finally, the US-Canada book retailing sector does indicate the disappearance of an important and much discussed friction to International Business – that of protectionist government policies. This particular case study of the international E-Commerce market for books in Canada and the US provides an interesting example of how protectionist barriers can be circumvented by e-commerce outfits.

Under the Canada-US free trade agreement as well as the North American Free Trade Agreement (NAFTA), the government of Canada was able to negotiate an “exemption” to free trade, and Foreign Direct Investment into Canada for what it defined as “Cultural Industries”. Essentially, these measures provided protection to Canadian companies from competition from US based companies. Cultural Industries are very broadly defined and they include bricks and mortar bookstores. Thus in the mid 1990s, when the US based bookstore Borders was set to enter the Canadian market by building a large chain of bookstores, the Canadian government, on extensive lobbying by Canadian bookstores such as Chapters, stopped this using the “cultural exemption clause” of the NAFTA. This effectively protected the Canadian book market from the entry of US booksellers.
The advent of international E-Commerce, however, has rapidly changed the marketplace for books in Canada. The NAFTA provision that stops US firms from investing in Canada, obviously has no validity for the book market on the Internet, where US companies do not make any investment in Canada, but merely ship books across the border from bases in the US.

Thus, the advent of the Internet has been important for reducing the effect of protectionist barriers such as those imposed by the Canadian government in the book retailing industry. The reduction of this potentially very large friction is consistent with our finding that prices charged on the Internet by Amazon and Chapters are broadly similar. The remaining sources of friction, however, are sufficient to prevent complete market integration and hence the Law of One Price is still violated.

Conclusions

In this paper we study the nature of international price competition in the online book retailing industry – one of the most important segments of B2C e-commerce. We examine if the Law of One Price operates between the leading online book retailers in the USA and Canada, a situation most favorable for the operation of the Law of One Price. We compare weekly prices for a sample a 3550 books over a period of 57 weeks at Amazon and Chapters Online, the leading online book retailers in the USA and Canada respectively and analyze these prices to test the Law of One Price.

We find that our data clearly contradicts the Law of One Price in levels with statistically significant difference in prices between the two stores. In the dynamic setting we find that the common currency relative price for books does not stay constant over the period under study – as would have been expected if the Law of One Price held in a ‘relative’ sense. The variation in this ‘real exchange rate’ in books is almost completely explained by movements in the US-Canada exchange rate during this period, indicating that book prices are far more ‘sticky’ than the exchange rate. Finally, there is no evidence that Chapters actually changes its prices in reaction to price changes initiated by the industry leader Amazon. In fact Chapters turns out to be changing prices far less frequently than Amazon.

We interpret all this evidence as indicative of lack of integration between two neighboring national markets separated by what is perhaps the most porous border anywhere outside the Euro area and faced with the least degree of cultural difference. If the Law of One Price fails under circumstances most favorable to it, it is only likely to be even strongly violated in other international business contexts.
The claim that the Internet has made the world of International Business ‘frictionless’ is, therefore, exaggerated at best. Frictions continue to keep national markets separated even in the online environment.

We next describe a few possible sources of friction that may be preventing complete market integration. International shipping costs appear to be an important hurdle that drives a wedge between prices in two countries. In our study, Amazon’s shipping costs to Canada as compared to Chapters, where able to some extent to erode its competitiveness in the Canadian market. We also argue that search costs and menu costs, may still be present in the online environment.

While these forms of friction continue to prevent integration of national markets, the advent of the Internet has at least circumvented a much more important hurdle, protectionist government policies. Indeed the Canadian book market is out of bound for US bricks and mortar chains because of the protectionist policies of the Canadian government – policies that are completely toothless against international online sales. The Internet has thus opened up certain hitherto protected markets. However, completely ‘frictionless’ international business has not yet emerged – even on the Internet.

Endnotes

1 We would like to thank Chris Studholme and Rahul Ravi for excellent research assistance and two anonymous referees for helpful comments.
2 An extended version of the Economist article is also published under the same title and under the name of the Economist journalist as Cairncross (1997).
3 In the case of many commodities like hamburgers, the presence of differently priced “non-tradable” inputs – like real estate prices – that, by definition, cannot be arbitraged away, also contributes to the failure of the Law of One Price in a significant manner.
4 Sometimes it is also achieved through cosmetic changes in the product but that is not applicable to books, the commodity under study here, because we are comparing identical books with identical ISBN numbers.
5 The original address of this site was www.evenbetter.com. However, during our study it was acquired by a more general comparison shopping site, DealTime.com (www.dealtime.com).
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