

**International Price Competition on the Internet:  
A Clinical Study of the Online Book Industry**

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**Abstract**

How borderless is the new economy? This paper addresses this question by examining the nature of price competition in books between a world leader in internet retailing, Amazon.com and the largest online retailer in Canada, Chapters.ca. The internet allows Canadian consumers to circumvent protectionist barriers by purchasing directly online from US booksellers. However Canadian online booksellers still enjoy considerable protection in the form of significant shipping cost advantages in selling to Canadian customers. The paper constructs a large panel dataset on prices, delivery schedule and popularity rankings of more than 5,000 books over 21 weeks, all collected from the internet. Using this data, the paper demonstrates that in spite of the existence of this shipping cost differential, the Canadian company sets prices that are on average remarkably close to the US prices, adjusted for the exchange rate. The paper also analyzes how the price differential varies over time and across different product characteristics as well as the dynamics of price setting in the two stores. While there is significant variation of the price differential across the different segments, this differential is always significantly smaller than the shipping cost advantage. This suggests that Chapters is partially foregoing its available rent.

*Keywords:* E-Commerce, International Price Competition

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## **International Price Competition on the Internet: A Clinical Study of the Online Book Industry**

*“Are we charging too little for our books?” Question to the CEO of Chapters Online at its 2000 AGM<sup>1</sup>.*

### **1. Introduction**

While the recent emergence of E-Commerce and the Internet has received huge attention in the business press, it has up to now, received scant attention in the academic International Business literature. This is in spite of the fact that some International Business textbooks (e.g. Wild, Wild and Han, 2001) have begun to publish “E-Business Editions” with significant coverage of the impact of E-Commerce on International Business. Clearly, research is required on the many different areas in which E-Business will impact on the conduct of International Business. This paper examines one such area.

How has the advent of online retailing of consumer products affected the nature of international competition for such products? With trans-border shopping becoming a matter of point-and-click, the internet potentially has the power to bring about fundamental changes in international competition. Companies now can access consumers around the world without having to make any foreign direct investment. Protectionist policies aimed at preventing the entry of foreign sellers into domestic markets fail to restrain domestic consumers from purchasing foreign goods online. Does this mean that the national border is losing its relevance in the international marketplace for consumer goods? Have transaction costs, and in particular search costs, now become a thing of the past? What about the impact of shipping costs? Have the old relationships and puzzles of international business ceased to exist in the virtual world? These are some of the questions that this paper addresses.

In order to investigate these issues we provide a clinical study of the pricing behavior between two competitors, each a leader of e-commerce in its own country, selling a common commodity (books) in two countries, Canada and the United States. The companies are

Amazon.com, a world leader in e-commerce from the US, and Chapters.ca, the leading online vendor in Canada. Amazon.com is a one of the world's largest and most successful internet retailers and is almost synonymous with the idea of buying books online. Chapters.ca is the leading online retailer in Canada across all product categories<sup>2</sup>.

Using an innovative data collection methodology we build a unique dataset, drawing the 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 more than 5000 books, collected weekly from March to August 2000. Each book is identified by a unique ISBN (International Standard Book Number), implying that we can compare the prices of identical products offered on two different websites, in two different countries in two different currencies. We are also able to obtain data on the time the company promises to take before it ships a book to a consumer as well as on the relative popularity of each book in our sample, as measured by its sales rank.

Using this data set as well as information provided by the companies on shipping costs, we are able to examine in detail, the pricing strategies of these two competitors and how they relate to each other. These price comparisons give us important insights into the nature of international competition, the differences that a national border makes in the New Economy, and how old rules of international competition are being re-written in the virtual marketplace.

The book industry is a natural choice for this type of study because of the popularity<sup>3</sup> and growing importance<sup>4</sup> of book retailing on the Internet. Furthermore, this clinical study is also of relevance in examining how the Internet may impact on protectionist policies of national governments. In February 1996 the well known US book-chains Borders and Barnes and Noble were considering entering the Canadian market. However, under heavy lobbying from the existing Canadian booksellers, the Canadian Government effectively blocked the proposed foreign direct investment of these US giants. With the advent of the internet, however, Canadian buyers can buy books from US online vendors with remarkable ease. This paper examines the extent to which the internet has opened up the Canadian market to US competition. Since prices charged by domestic suppliers in a protected environment usually exceed those of foreign

competitors, an international price comparison like the one done in this paper provides a measure of the degree of cross-border integration.

The next section reviews the different branches of literature germane to our research. The third section describes the structure of the book retailing industry in Canada as well as the two firms examined, Amazon and Chapters. The data and our data collection technique are detailed in the fourth section. The fifth section analyzes aspects of non-price competition between the two stores while the sixth section provides a detailed analysis of price competition. The seventh section concludes with pointers towards future research.

## **2. Previous Research**

Online international competition among retailers is a recent phenomenon, as are most other e-commerce activities. This paper is, to the best of our knowledge, the first attempt 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 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 important 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 be responsible for much more. In their model transaction costs hold the key to several major puzzles of international economics. One of the key issues addressed here is the role that transactions costs – including search costs and shipping costs – play in the internet environment.

US-Canada comparison of prices and trade volume has been a widely researched area in international economics. The reason for this popularity lies not only in the geographical proximity and a cross-continent common border between the two countries but in the comparability in income levels, relatively free trade regimes and the cultural proximity of consumers in the two nations as well. One of the puzzles that Obstfeld and Rogoff hold transaction costs to be responsible for is McCallum's 'home bias in trade' puzzle. McCallum (1995), by studying trade flows across the US-Canada border to that within Canada, found that the border acts as a significant barrier to trade flows. In 1988, trade linkages between the Canadian provinces was as much as twenty times greater than that between these provinces and US states after accounting for size and distance. Engel and Rogers (1996) find much higher cross-border variation than within-country variation in price levels for the same categories of goods implying a significant border effect in the determination of prices. They conclude that sticky nominal prices, which may be a possible explanation for this, does not explain the entire border effect. Helliwell (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).

The retailing sector has traditionally been one of the most non-traded of industries by the very nature of its activity. While international sourcing of commodities for retailing has been quite common, catering 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.

The advent of the internet and the increasing popularity of e-commerce is rapidly changing the nature of the retailing sector by reducing search costs. While the effects of e-

commerce on international retailing has not yet been subjected to serious inquiry, a rapidly growing body of literature has focused on online retailing with book retailing itself being among the more popular segments for research. Kotha (1998) takes a close look at Amazon.com's business strategy while Kotha and Rindova (1999) documents the way the online giant built its reputation and brand name on the internet. Bailey (1998), by comparing conventional and internet prices for books, CDs and software, finds greater dispersion in prices of homogeneous goods on the internet than in traditional stores. Brynjolfsson and Smith (2000) study prices of books and CDs at conventional stores and the internet. They find that the internet prices are significantly lower and have much smaller adjustments indicating lower friction in the online market than in the conventional sector. Bakos and Brynjolfsson (1999) look at optimal bundling strategies for selling information goods on the Internet. Lynch and Ariely (2000) focus on the online wine market to study the effect of reduced information search cost in online shopping for a differentiated product.

The present paper contributes to all these disparate lines of inquiry. By studying the pricing behavior of the leaders of online retailing in the USA and Canada, we not only add to the emergent area of e-commerce research but also bring out the implication that the new economy has for international retailing and trade in general and US-Canada trade and competition in particular.

### **3. Chapters, Amazon and Book Retailing in Canada**

Before 1995 the Canadian book selling industry consisted of a large number of small independent sellers and a few medium sized chains. The major threat to these stores was perceived as coming from the very large chains that dominated the U.S. bookselling market including Borders and Barnes and Noble. In a protectionist effort to solidify the position of the Canadian owned stores, the Canadian government followed a two-pronged strategy. Firstly, the Federal Competition Bureau allowed the merger of various medium sized book chains into a single dominant Canadian owned book retailer called Chapters. This chain quickly began a large expansion of "big box" superstores.

The second protectionist element from the Canadian Government involved blocking the planned foreign direct investment into Canada in 1996 by large American booksellers like Borders and Barnes and Noble. Famously, the Free Trade Agreement (FTA) signed by Canada and the United States as well as the NAFTA agreement allows Canada to exempt “Cultural Industries” from other articles of these agreements. This exemption includes articles relating to the free flow Foreign Direct Investment from the US into Canada<sup>5</sup>.

Four years later, online retailing has become a significant part of the Canadian bookselling industry. In addition to its bricks and mortar stores, Chapters now also has an online operation at the Chapters.ca website. However, while Chapters still maintains its dominant position in the Canadian market for bricks-and mortar booksellers, the important question posed in this paper is the extent of the competition it now faces from US online booksellers such as Amazon.com. Unlike the traditional bookstores, online retailers are not controlled by the FDI regulations that previously denied the US chains access to the Canadian market. Because of the reduced costs of price comparison as well as the ease of making cross-border purchases, Chapters has to keep in mind Amazon’s prices, although Amazon has no physical presence in Canada.

Thus a comparison of two major online book retailers, one from Canada and the other from the US, provides an important case study to examine the impact of e-commerce in opening up hitherto protected borders. There are various reasons why the North American book market, the product category examined here, is on the forefront of international E-Commerce. Books constitute the largest sector among all online retail categories, followed by CDs, videos, software and travel<sup>6</sup>. Besides, the USA and Canada are on par with regard to Internet penetration rates, both being amongst the highest in the world<sup>7</sup>. While US online sellers initially dominated e-commerce activities in Canada, Canadian businesses are now providing increased competition. The proportion of Canadian online purchases from foreign (almost entirely US) vendors for all categories of goods fell from 63% in 1999 to about 50% in 2000<sup>8</sup>. The two e-commerce retailers compared in this paper, Amazon.com and Chapters.ca are the two most popular e-commerce sites in Canada for all product categories, not just books. Chapters.ca is also the highest ranked e-commerce site (by visits) with a Canadian (i.e. “.ca”) designation<sup>9</sup>.

Amazon.com was founded in 1994 and has become a remarkably successful company both in terms of revenue growth (Kotha, 1997) and size of its product offering. Being one of the first entrants to the world of e-commerce, Amazon is among the most visible and successful e-commerce companies. It is also by far the world's largest online bookseller. Amazon has more than 3.1 million titles on offer, which is approximately 15 times larger than any conventional bookstore<sup>10</sup> and its revenues from books alone is far in excess of that of its nearest competitor, Barnes & Noble.com<sup>11</sup>. The story of the company has been featured in every important business magazine and its founder, Jeff Bezos, became the Time magazine Man of the Year in 1999.

Chapters.ca started as the first major Canadian online bookseller only in April 1999. It is thus useful to think of Chapters.ca as being the new entrant into the Internet bookselling market, competing with a dominant incumbent Amazon. In 2000, Chapters.ca had a customer base of over half a million consumers<sup>12</sup> and offered over 2.5 million titles for sale<sup>13</sup>. In the very first year of its existence, 23% of Canadians had visited the site<sup>14</sup>. According to an Angus Reid/Deloitte and Touche survey the number of Canadians who bought from Chapters.ca, was the same as the total number of customers who visited the next three largest e-tailers combined<sup>15</sup>. The company is yet to turn a profit but with rapidly increasing revenues, the losses as a percentage of sales has been declining rapidly.

In spite of its impressive debut, Chapters.ca still remains a much smaller competitor to Amazon.com. While Amazon has served a over 17 million customers in its five years of existence, Chapters has had a little over half a million customers in its first year of operations. The Chapters total revenue in the year 1999-2000 of roughly US \$ 25.8 million (C\$ 38.7 million) pales in comparison with Amazon's total 1999 sales of US \$ 1.64 billion (of which books accounted for slightly less than half). In 1998 Amazon employed over 1600 people while in 2000 Chapters had slightly over 200 workers. Nevertheless, Chapters does compare favorably with Amazon in certain other respects. According to a recent Internet survey of Canadian online shoppers, 26% bought from Chapters while only 5% bought from Amazon<sup>16</sup>. So, in spite of its relatively small size and late entry, Chapters is proving to be a significant competitor to Amazon in the Canadian online marketplace.

While the effects of international competition in online retailing may exist on both sides of the border, given the much 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. This is indeed reflected in the fact that Amazon is among the most visited e-commerce sites in Canada while Chapters has never attracted significant visitors from the US. Therefore this study focuses on price competition in the Canadian market.

#### **4. Data and Data Collection**

One of the major innovations of this paper comes from the way the dataset used here is constructed. The data collected here comes entirely from publicly available data available on the Internet. However, to the best of our knowledge, this is the first time such a dataset has been constructed solely from the Internet. The data collection technique is outlined below.

One of the reasons for selecting books for our study of online competition is the fact that the specifications of the product, i.e. the physical characteristics of a book are perfectly captured by what is known as the International Standard Book Number or the ISBN of a book. Two books with the same ISBN, regardless of where they are sold, are identical not just in their contents but in every respect including the form of binding. Thus in order to construct our dataset of books, we begin by building a sample of ISBNs. However, the ISBNs should be obtained from a source independent of the two bookstores under study, in order to maintain complete randomness in our selection. Hence we select an online book-selling site “even better.com”.<sup>17</sup> This site is one of a rising genre of web-sites that are essentially shop-bots, that is they are specialized search engines that find the best prices among several online sellers for a specified item, in our case for a particular book. From the list of books available at this site, we generate a sample of ISBNs of 20,000 books in different categories<sup>18</sup> using proportionate random sampling.

Having created this sample, the next step is to create and run a program which does the following: for every ISBN in our list, it searches the Amazon web-site and the Chapters web-site and from each of these sites it records the price of the book as well as the promised time to

delivery (i.e. time it takes for the store to ship the book – the time it takes for the shipped item to reach the customer is not included in this). In case of Amazon, it also records the ‘sales rank’ of the book, which serves as a proxy for the popularity of the book (the lower the sales rank, the more popular the book has been). In the absence of quantity data, this ‘sales rank’ provides us with the best available measure of the popularity of a particular title. This process generates our data for one particular week. We set up to run this program automatically every Monday night, so as to obtain this data every week. The first run was conducted on March 20, 2000 and the last run on August 7, 2000. Thus we construct our panel dataset with observations for 21 weeks.

Not every book in our sample of 20,000 books is listed with both Amazon and Chapters for all the 21 weeks. Even when a book is listed at both places it is not always possible to get an Amazon ‘sales rank’ number for the book. We therefore selected 5,125 books that were listed in the two stores for all the 21 weeks and for which a ‘sales rank’ figure could be obtained for all the 21 weeks. Thus we constructed a panel data set of 5125 observations (books) and 21 weeks for five variables – the price of the book in each store, the time to delivery (pre-shipping) at each store and the popularity ranking of the book at Amazon.

Prices at Amazon and Chapters cannot be compared without converting them to the common currency. We obtained the Canadian Dollars – US Dollars exchange rate for every Monday (the days our data collecting program were run) from the web-site of OANDA<sup>19</sup> and used these figures to convert the Amazon prices to Canadian Dollars. The descriptive statistics of the constructed data set in Canadian dollars are exhibited in table 1.

In order to understand the relationship between various non-price characteristics of a book and its price, we also disaggregate our data according to various criteria. Firstly, we divide the books into different groups by the level of popularity. In order to make the popularity ranks less dependent on the Amazon figures, we also obtain the sales ranks of these books from another American online store Barnes & Noble.com . We then combine these two ranks to develop our own ranking. The combination of ranks is done in the following way. First the raw sales rank number in each store is used to obtain a new ranking of the books from 1 to 5125. Then the average of these ranks in the two American bookstores was taken for each book and a final re-

ranking was done on the basis of these combined rank figures. This final ranking numbers were then split up into five quintiles to give us the five popularity categories of our study.

The second criterion we use to segment our sample is availability or speed of delivery (prior to shipping). Speed of delivery (pre-shipping) is clearly an important element of competition in the on-line retailing business. Table 2 lists the different delivery times of Amazon and Chapters. Since the different delivery time categories differ in the two stores, for better comparison we develop a common set of delivery times which is shown in the last column of table 2.

Finally, books are also categorized according to their price. This is done by computing the average price charged in the two stores for each book in each week and segmenting the books into quintiles on the basis this average price.

## **5. Elements of Non-price Competition in the On-line Book Industry**

Given the uniformity in product quality and ease of price comparison (possibly aided by artificial intelligent agents like shop-bots) on the internet, it is likely that price competition is even more crucial in the online environment than for traditional retailers. However, prices are not the only dimension of competition. Online book retailers like Amazon and Chapters presumably compete on several other criteria like their traditional counterparts. These would most likely include effective cost to the consumer, time to delivery and book availability, brand name or reputation and quality of service including such diverse features as the attractiveness and functionality of web-page design, the effectiveness of search engines, suggestions and feedback from fellow shoppers etc. This section compares the two stores on different non-price dimensions of competition while the following section presents a detailed analysis of price competition.

### *5.1 Shipping Costs*

A critical component of the cost of purchasing a book online is the shipping cost which is not reflected in the quoted price. Table 3 provides detailed descriptions of the alternative shipping

options and costs available to consumers from both of the two retailers. The key finding from table 3 is that purely in terms of shipping costs it is significantly cheaper and quicker to purchase a book from a retailer within your own country than to purchase a book that requires trans-border shipment.

For example for a Canadian living in an urban area, to purchase a book from Chapters in Canada, the cheapest option is paying C\$2.75 per shipment plus C\$0.75 per book with delivery in 1-3 days. The same book from Amazon in the US would cost approximately C\$6 (US\$ 4) per shipment and C\$2.92 (US\$ 1.95) per book with delivery in 2-4 weeks (assuming 1US\$=1.5C\$). Thus just comparing the *cheapest* prices in the two stores, he would pay 2.5 times higher shipping costs (roughly a differential of C\$5.50) for buying a single book from Amazon and then have to wait 1½ to 3½ weeks longer for delivery. In order to get the book delivered at roughly the same time he would have to pay over C\$50.00 to buy it from Amazon. In order to keep these numbers in perspective, we should note that the average book price over our entire sample is less than C\$36.00 (see table 1). Thus the seemingly innocuous shipping charges drive a sizable wedge between book prices that the two vendors can charge so that the ultimate cost to the consumer would be comparable. There is absolutely *no* arrangement where Amazon can beat Chapters at delivering the book faster to the urban Canadian buyer. Thus for such a buyer, Chapters is *always* the fastest and the cheapest source of books in terms of shipping only. Of course, the exact shipping cost differential would depend on the number of books ordered at a time<sup>20</sup>.

This implies is that in terms of the all-inclusive final cost to the Canadian buyer, Chapters enjoys a ‘protection’ from its foreign competitor, Amazon, simply because of the shipping cost differentials. This may be thought of as a type of ‘rent’ that Chapters could possibly extract – a rent that arises from the market imperfection in the form of shipping cost differentials. In other words, this provides an opportunity for Chapters to charge a higher price than Amazon – a “Chapters premium” – while still keeping the in-hand cost of the book lower for the Canadian buyer. The upper limit of this premium is, of course, determined by the shipping cost differential. How much of this potential price premium Chapters actually appropriates is an important part of our study.

## 5.2 *Product Availability*

Another important element of competition in any retailing business is the issue of product availability. For any distance delivery retailer, the issue of delivery time is also of crucial importance. Table 2 lists the different delivery times available in each of the web sites and figure 1 describes the distribution of books among the different delivery times in the two stores. The median delivery time of each of the 5125 books over the period of 21 weeks is used for creating this figure. Note firstly that these delivery times are the ones promised by the stores on their web-sites. Both stores have a caveat that the promised times may change without notice. Secondly, the time that it takes for a book to reach a customer after placing an order is the sum of the delivery time used here and the relevant shipping times (chosen by the consumer from the options in table 3).

When examining figure 1, it is important to reiterate that our data consists of those books for which we found a price quotation in each of the 21 weeks for both stores for all of those weeks. Consequently, these availability proportions do not reflect those out of a random sample of books drawn from all titles in print. It is fair to assume that the proportion of “currently unavailable” would be significantly higher in both stores out of such a sample. Figure 1 shows that among the books in our sample both Amazon and Chapters have the largest proportion available within 24 hours – over 45% for Amazon and more than 53% for Chapters. However, while Chapters dominates in the ‘within a day’ segment, Amazon has a much larger proportion available in less than a week. The proportion of books currently unavailable at Amazon (1.9%) is about half of that at Chapters (3.7%).

## 5.3 *Other Elements of Competition*

While prices and availability are probably the two most important dimensions of competition in online retailing, there are several other features on which firms compete, many of them based on consumer behavior. Branding and reputation are clearly of exceeding importance in ensuring the success of any business-to-consumer (B2C) firm. Kotha and Rindova (1999) describe, in detail, the conscious brand development strategy used by Amazon. Besides, the

significant attention Amazon has received from the press owing to its pioneering role in the rise of e-commerce has helped it become one of the most familiar brand names among online consumers. In comparison, Chapters, though a new company, may have some benefit from having a brick and mortar presence in most major Canadian cities. In terms of web page characteristics, a recent study has ranked both Chapters and Amazon among the top five e-commerce web sites<sup>21</sup>.

## 6. Analysis of Price Competition

As noted above in section 5.1, Chapters enjoys an inbuilt advantage over Amazon in the Canadian market in terms of shipping costs. If Chapters were to compete with Amazon only on a ‘total cost to consumer’ basis, then it would be able to charge a ‘premium’ over Amazon on the listed price. Since the total cost to the consumer is the sum of the listed price and the shipping costs, this ‘premium’ would be limited to extent of the shipping cost differential. Furthermore, if the protectionist policies of the Canadian government actually affect this market, then this would also enable Chapters to charge a higher price to Canadian consumers. Using the dataset described above, this section explores and analyzes various aspects of price competition between Amazon and Chapters, particularly the existence and characteristics of this potential price premium.

### 6.1 *Does Chapters appropriate the available price premium?*

In order to examine the extent to which Chapters actually appropriates its potential price premium, this sub-section examines the relationship between prices charged by the two retailers. Table 1 above showed that the average of all 5125 books over all 21 weeks at Amazon.com was C\$ 35.50, while the average of all books over all weeks at Chapters.ca was C\$ 35.36 – a difference of 14 Canadian cents or less than half of one percent. Thus Chapters is actually charging *less* than Amazon on average, though the difference is very small.

Figures 2 and 3 examine this data over each of the 21 weeks. Figure 2 plots the weekly average prices for Chapters (in C\$) and Amazon (in both US\$ and C\$) for the sample. Figure 3 plots the difference between these prices (Chapters-Amazon) as well as the value of the t-statistic

of the test of the null hypothesis of price equality in the two stores for every week. The critical values for rejecting the null hypothesis are also provided in figure 3. The maximum value of Chapters premium (Chapters price – Amazon price, average over 5125 books) is 45 cents while the minimum is minus \$1.10. The Chapters price is significantly higher than Amazon's in 5 of the 21 weeks while Amazon has a significantly higher price in 7 weeks. However, of the 7 weeks of Amazon charging a significantly higher price, 5 occur in a run between weeks 15 and 19. For 9 out of the 21 weeks studied, the difference between the prices in the two stores is not significantly different from zero. From these figures it can be seen that while there is some variance of average price differences between weeks, these differences are not *systematic*. This finding is of importance because it shows that there is no evidence that Chapters appropriates the rent available to it owing to the shipping cost advantage discussed above.

It appears from Fig.2 that movements in Amazon prices in Canadian dollars reflect those in US dollars. In other words, Amazon price movements dominate exchange rate movements. Indeed the coefficient of variation for Amazon prices is, at 1.2%, is about one and a half times that in the exchange rate (0.8%) and three times that of Chapters (0.4%). The question of what role exchange rate variations play in determining the price premium can be examined more closely by comparing the actual exchange rate movements with movements in the 'implied exchange rate'. The implied exchange rate is defined as the ratio of average book prices in a week measured in their original currencies. Thus the average book price at Chapters in Canadian dollars divided by that at Amazon in US dollars gives us an implied exchange rate for the two currencies. The comparison between actual and implied exchange rates is given in figure 4. If the law of one price held perfectly during the period under study, the two lines in figure 4 would coincide. If the two rates are different but move in step, then this implies a constant price premium when measured in the same currency. As is evident from figure 4, no such constancy in the price premium is noticeable. However, in the first half of our sample, the two rates appear to move in the same general direction. This indicates that the relative book prices are somewhat responsive to exchange rate movements. But after week 15, the two rates diverge significantly indicating a change in relative prices in the opposite direction from the much smaller exchange rate movement. Almost the entire movement during this period is caused by changes in book prices at Amazon.

Figure 5 provides a different view of the price data, considering the median prices of each individual book over 21 weeks. The Chapters price of each of the 5125 books is plotted against the Amazon price. The scatter plot data clusters around the (dotted) 45° line indicating that there is a close relationship between the Amazon and Chapters price for each of the books. This is confirmed by the OLS regression of the Amazon prices on the Chapters prices (results reported on figure 6) which has an estimated coefficient of 0.926, with a regression  $R^2$  of 0.94.

## 6.2 *The price premium: Further Evidence from Segmented Data*

This section examines the relationship of Chapters premium with various characteristics like pre-shipping delivery time, popularity and price by segmenting the full database into appropriate categories.

Fig.6 plots the difference in price between Chapters and Amazon for each of seven different delivery segments. These segments are defined by cumulatively combining the seven segments described in table 2. For example the segment 3-5 weeks in fig. 6 consists of all books that *both* stores can deliver in not more than 3-5 weeks. The reason for defining the segments in this cumulative manner is that the delivery schedules for the two firms do not match perfectly (see table 2). Fig. 6 shows that Chapters charges a statistically significant price premium for books that can be delivered in relatively short periods. For example for books which both stores can ship within 24 hours, Chapters charges C\$ 1.28 more on average than Amazon. This premium however declines monotonically as books with higher delivery times are added to the data. Thus Chapters appropriates part of its available premium for books that can be delivered relatively quickly.

Fig.7 shows the difference in price between Chapters and Amazon for the five different popularity segments. These popularity segments are constructed by dividing the popularity rank data (see section 4 above) into five quintiles. This figure shows that Chapters charges a significant premium for the most popular books. As the popularity of books decreases, the Chapters premium declines monotonically. For the less popular half of the entire dataset,

Chapters actually charges significantly less than Amazon. In other words, Chapters extracts some of its potential rents from high demand books.

Fig.8 describes the price difference for the different price categories from least expensive to most expensive. Once again, these segments are constructed by dividing the price data (see section 4 above) into five quintiles. From this figure it can be seen that Chapters charges significantly less than Amazon (or sells at a discount) for the most expensive 20% of the books. For the remaining 80% of the sample, Chapters charges a significant premium. However the discount in the most expensive category (C\$ 4.64) is far higher than the premium charged for the other 80% of the books (less than a dollar on average).

This subsection shows that while on a grand average over all books and all weeks Chapters does not seem to be charging a premium, the book level price differences are far from random. Chapters does seem to be following a pricing strategy whereby it extracts a significant premium for certain kinds of books while conceding a discount in other segments.

### *6.3 Price Changes over Time*

The next major issue to explore is to study how the prices of the two retailers vary over time. One of the advantages of online retailing is claimed to be the ease with which prices of a large number of products can be changed frequently and by small amounts (see Bakos and Brynjolfsson (2000)). In other words, ‘menu costs’ are significantly lower on the Internet. In view of this, it is particularly interesting to see how the two major booksellers of our study vary their listed price over time and if there is any observable pattern in these price changes.

The first issue to examine here is how often the two stores change their book prices, as an indication of how ‘sticky’ prices are on the internet. A comparison of price changes over time between the two stores reveals significant differences in their price adjustment patterns. While in an average week, Amazon changed its prices for 8.4% of the sampled books compared to the price in the previous week, Chapters adjusted prices for only 1.7% of these books. Since Amazon offers a much larger number of books than Chapters this 5:1 ratio observed in our sample implies

an even greater divergence in the number of books actually re-priced at the two stores in an average week. Fig.9 shows the proportion of books with a price change in each of the 20 weeks for each of the two stores. The maximum proportion of books that underwent a change in price in any of the 20 weeks (weeks 2 to 21) observed is 45% for Amazon and 12% for Chapters while the minimum is 1.19% and 0.04% respectively. The figure also shows that there is significant variation in the number of books re-priced at any store over time. In only 4 of the 20 weeks, did Chapters change prices for more books than Amazon. Also there seems to be some ‘clustering’ in price adjustment for Amazon. The two weeks with highest proportion of price changes (week 7 and 21) had more than double the number of books with prices changed compared to that in the third highest week (week 20). However, there does not appear to be any evidence of systematic dependence or causality between the price changing behavior of the two stores<sup>22</sup>.

Closely related to the issue of how many books experience a price change is the question of the magnitude of these changes. In order to examine this issue, we select the three weeks with maximum changes in both stores and classify the changes into 6 groups according the size of the percentage change in price from the previous week. This data is presented in Fig. 10. The figure indicates that Chapters has a far higher proportion of large (above 20%) price changes than Amazon. Thus figures 9 and 10 together suggest that Chapters makes relatively fewer but larger price changes than Amazon. In other words, Amazon seems to be making considerably greater use of the reduction in menu costs offered by online retailing than Chapters.

#### *6.4 Possible explanations*

As noted in sub-section 6.1 above, Chapters actually charges slightly less than Amazon on average in our sample of 5125 books over 21 weeks. At the same time, as sub-section 6.2 shows, there is significant variation in the price differential between the two stores in the different segments examined. The key point, however, is that in none of the segments studied above did the excess of the Chapters price over the Amazon price come close to the shipping cost advantage that Chapters has when serving Canadian consumers. Across all segments and all weeks examined here the maximum of this excess is \$2.60 (in the segment of ‘most popular books’, Fig.7). This is considerably smaller than the shipping cost advantage enjoyed by Chapters

discussed in section 5 above. The shipping cost difference is \$5.50 when the customer orders only one book in a shipment and even then Chapters delivers considerably sooner than Amazon. In this sub-section we offer a few possible explanations for this phenomenon.

One possible explanation lies in consumer behavior. It is conceivable that online shoppers actually make their decisions on the basis of the listed prices only without properly factoring in the shipping costs. There is evidence in the traditional marketing literature of consumers tend to underestimate total prices in situations of ‘partitioned prices’, i.e. when prices have more than one component, with shipping costs being a typical example (see Morwitz *et.al.* (1998)). Given the web page design of both these stores as well as most other online retailers, while the price of the product is prominently displayed early in the price comparison process, the shipping costs usually come up only after the consumer selects an item for purchase and completes a few steps in the process of ‘checking out’. Thus if Chapters actually raises its price to incorporate most of the shipping cost advantage, it may actually lose customers early in the selection process unless it can somehow convince them of the shipping cost advantage early on.

It is important to note that for the above explanation to work, it only requires Chapters to *believe* that consumers behave this way while setting its prices. Clearly the area of online consumer behavior requires further research before definitive conclusions can be reached regarding this explanation.

Another possible explanation for the part of rent foregone is that Chapters, being comparatively a late entrant into the business, may be keeping its prices low in order to gain a larger market share. If this hypothesis is correct then we should expect to see Chapters prices rise in the future after their market share stabilizes at a higher level.

## **7. Conclusions and future research**

While the rise of e-commerce has the potential to change the dynamics of international business by significantly reducing cross-border transaction costs, the impact of the internet on international business remains relatively unexplored. This paper focuses on two online

booksellers selling identical products in Canada and the US in order to evaluate the effects of international borders on the internet. We build an innovative database of over 5,000 price observations and other retailing characteristics in the two stores over 21 weeks entirely from publicly available data on the web. Using this dataset we analyze the nature and dynamics of online price competition across borders.

Two of the more common impediments to international competition are government imposed protectionist barriers and transaction costs including search costs and shipping costs. Both these factors have been important in the Canadian book retailing industry in the past. With the advent of the internet, however, protectionist barriers as well as search costs are believed to have become almost irrelevant. We find that cross-border shipping costs still continue to provide significant protection to Canadian online booksellers. However, we also find that average prices at Chapters are remarkably close to those at Amazon measured in Canadian dollars. In other words, it appears that Chapters is not fully appropriating the rent available to it.

Probing further into the issue of the 'Chapters premium', we find that there is significant variation in the price differential between the two stores over time and across different categories of books. The Chapters premium declines monotonically with increasing pre-shipment delivery time at both stores. Chapters also charges a higher price for more popular books but less than Amazon for the less popular ones. Finally Chapters charges a lower price than Amazon for books in the most expensive quintile, but a higher price for all other books. Nevertheless, in all segments considered here the 'Chapters premium' is significantly lower than what would be expected given its shipping cost advantage.

The reason behind this may lie in the possibility that online consumers may fail to properly account for shipping costs or that aggressive price competition is being used as an entry strategy for Chapters. There may be several other possible explanations for this phenomenon. However, the near price equalization found in this paper strongly implies that protectionist barriers, while preventing the entry of traditional US bookstores, are completely ineffective in the online market.

The approach to data collection used here is readily applicable in research on other areas of e-commerce as well as traditional commerce. The vast amount of real-time but constantly changing data freely available on the internet provides many opportunities for research. A good example of such data are the various auction sites like eBay or Priceline.com. However, often the challenge is to record and assimilate this transitory information into a form that is amenable to research and analysis. One of the main innovations of this paper has been to build and utilize such a dataset.

In terms of future research directions, this paper is probably among the first of many in the promising area of cross-border electronic commerce. Many other areas of international business are being transformed by the internet. While this paper has focused specifically on the business to consumer (B2C) sector of e-commerce, current trends indicate that the present dominance of the business-to-business (B2B) sector is likely to continue. The international element is probably even more important in the B2B sector than in the B2C sector. These topics will remain important areas for international business research.

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Table 1: Descriptive Statistics of Panel Data  
(All prices in Canadian Dollars)

| Variable  | No. of books | No. of weeks | Mean  | SD    | Min     | Max    |
|---|--------------|--------------|-------|-------|---------|--------|
| Amazon price  | 5125         | 21           | 35.50 | 39.63 | 1.16    | 601.12 |
| Chapters price  | 5125         | 21           | 35.36 | 37.84 | 1.00    | 583.50 |
| Price Differential<br>[Chapters price - Amazon price] | 5125         | 21           | -0.14 | 10.00 | -186.01 | 96.25  |
| Exchange Rate (CAD/USD)                               | N/A          | 21           | 1.48  | 0.01  | 1.45    | 1.50   |

Table 2: Availability Categories

| <b>Amazon</b>     | <b>Chapters</b>           | <b>Common schedule</b> |
|-------------------|---------------------------|------------------------|
| 24 hours          | 24 hours                  | 24 hours               |
| 2-3 days          | 7 business days           | 2-3 days               |
| 1-2 weeks         | 3 to 5 weeks              | 1-2 weeks              |
| 4-6 weeks         | 6 to 10 weeks             | 3-5 weeks              |
| not released yet  | unconfirmed               | 4-6 weeks              |
| not published yet | unavailable               | 6 weeks and more       |
| not available yet | publication cancelled     | Currently Unavailable* |
| back order        | out of stock indefinitely |                        |
|                   | out of stock              |                        |
|                   | out of print              |                        |
|                   | not yet released          |                        |

\* Includes the last 4 categories for Amazon and last 7 categories for Chapters

Table 3: Shipping Costs between and within Countries

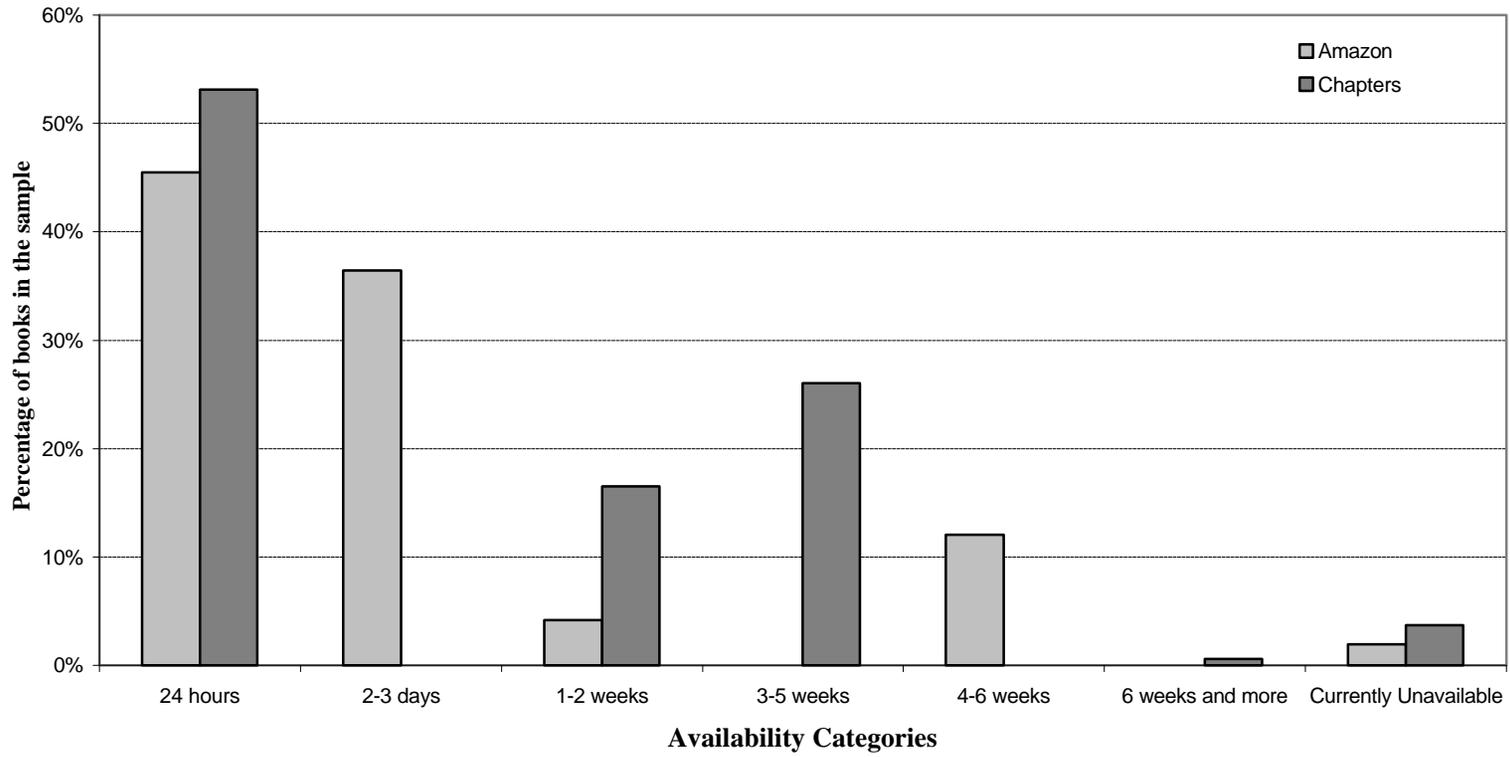
| <u>Panel A: Amazon.com</u>     |                                 |                             |                         |                                 |
|--------------------------------|---------------------------------|-----------------------------|-------------------------|---------------------------------|
|                                | <b>Cost per shipment (US\$)</b> | <b>Cost per book (US\$)</b> | <b>Time to delivery</b> | <b>Carrier</b>                  |
| <u>Shipping to Canada</u>      |                                 |                             |                         |                                 |
| Standard (Option 1)            | 4.00                            | 1.95                        | 2-4 weeks               | Canada Post/ Std. Shipping      |
| Standard (Option 2)            | 7.00                            | 5.95                        | 7-26 business days      |                                 |
| Express                        | 30.00                           | 5.95                        | 1-4 business days       | International Priority Shipping |
| <u>Shipping within the USA</u> |                                 |                             |                         |                                 |
| Standard (Option 1)            | 3.49                            | 0.99                        | 3-7 business days       | Standard Ground                 |
| Standard (Option 2)            | 6.99                            | 1.99                        | 2-3 business days       | UPS                             |
| Express                        | 8.00                            | 2.99                        | 1-2 business days       | UPS                             |

*Source: Amazon.com web-site*

| <u>Panel B: Chapters.ca</u>   |                                |                            |  |                               |
|-------------------------------|--------------------------------|----------------------------|--|-------------------------------|
|                               | <b>Cost per shipment (C\$)</b> | <b>Cost per book (C\$)</b> | <b>Time to delivery</b>  | <b>Carrier</b>                |
| <u>Shipping within Canada</u> |                                |                            |  |                               |
| Standard                      | 2.75                           | 0.75                       | 1-3 days for urban centres;<br>5-7 business days for rural areas | Canada Post                   |
| Express                       | 20.00                          | 1.00                       | 1-2 days   | Priority Courier              |
| <u>Shipping to the USA</u>    |                                |                            |  |                               |
| Standard                      | 5.00                           | 1.00                       | 14 business days (average)                                       | Canada Post                   |
| Express                       | 15.00                          | 5.00                       | 1-3 days   | Express International Courier |

*Source: Chapters.ca web-site*

**Fig. 1: Percentage of Books in each Availability Category  
(median over 21 weeks)**



**Fig. 2: Average Book Prices (n=5125) in the Two Stores Over 21 Weeks**

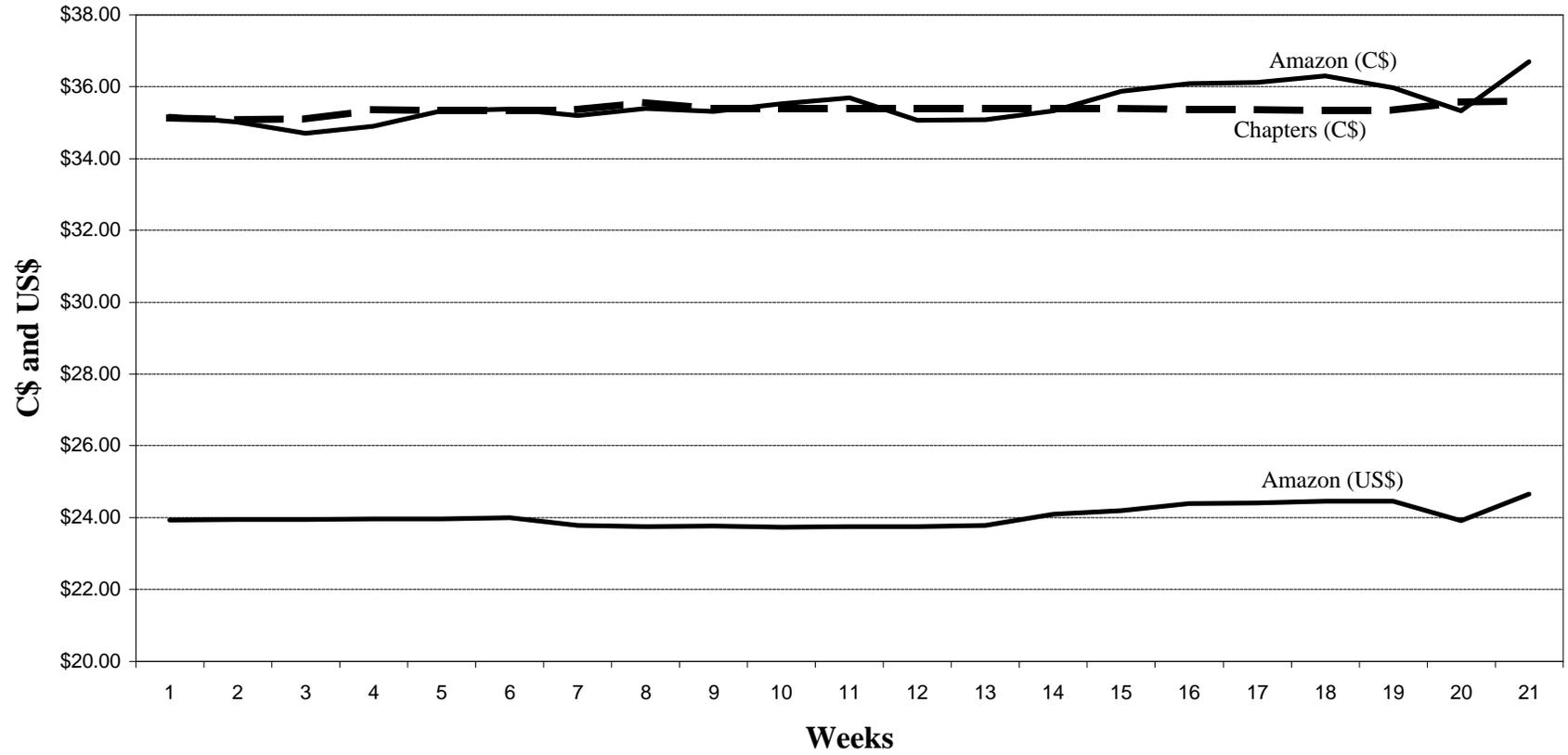


Fig. 3: Chapters Premium: Value and Statistical Significance by week  
(5125 books in each week)

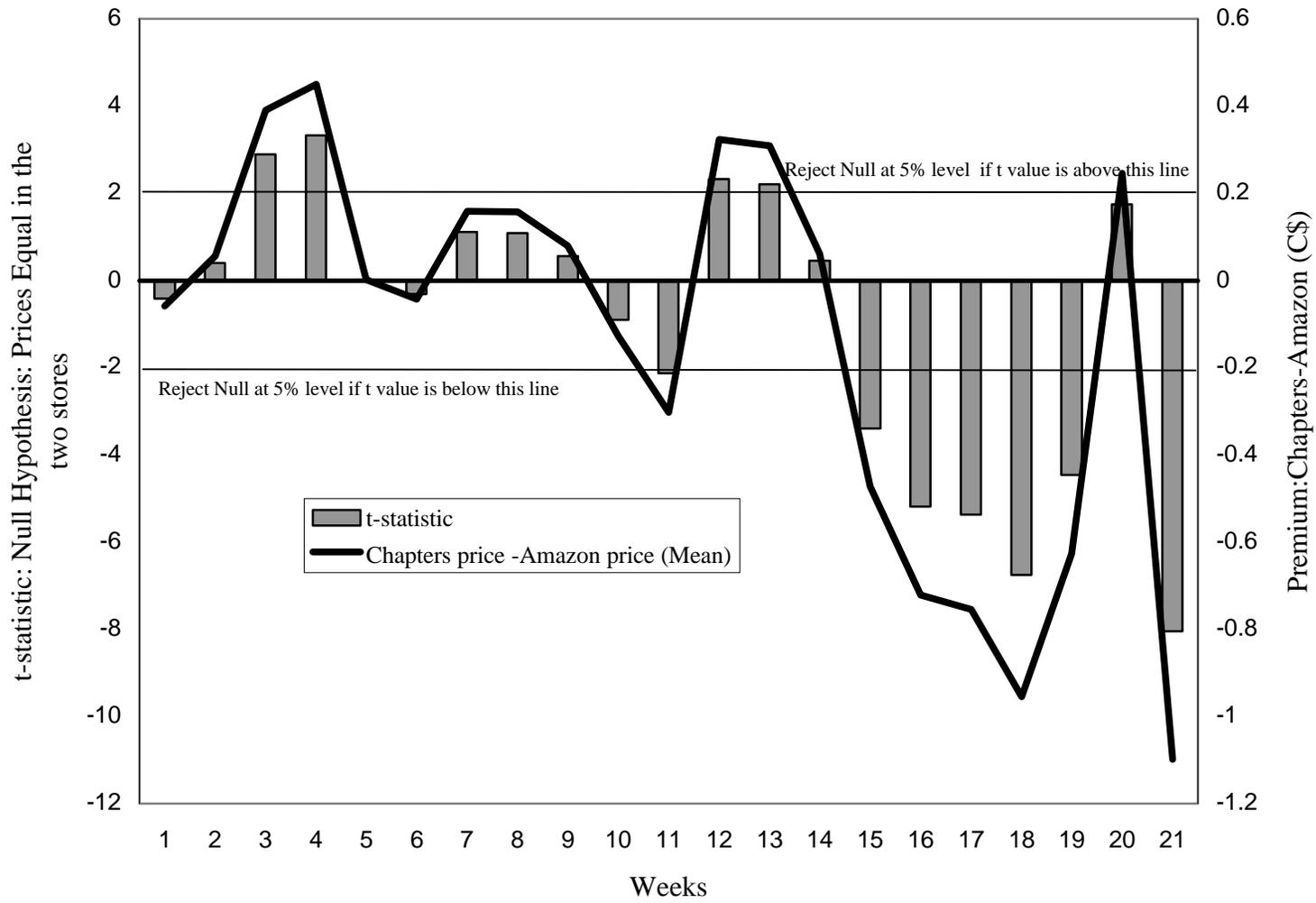
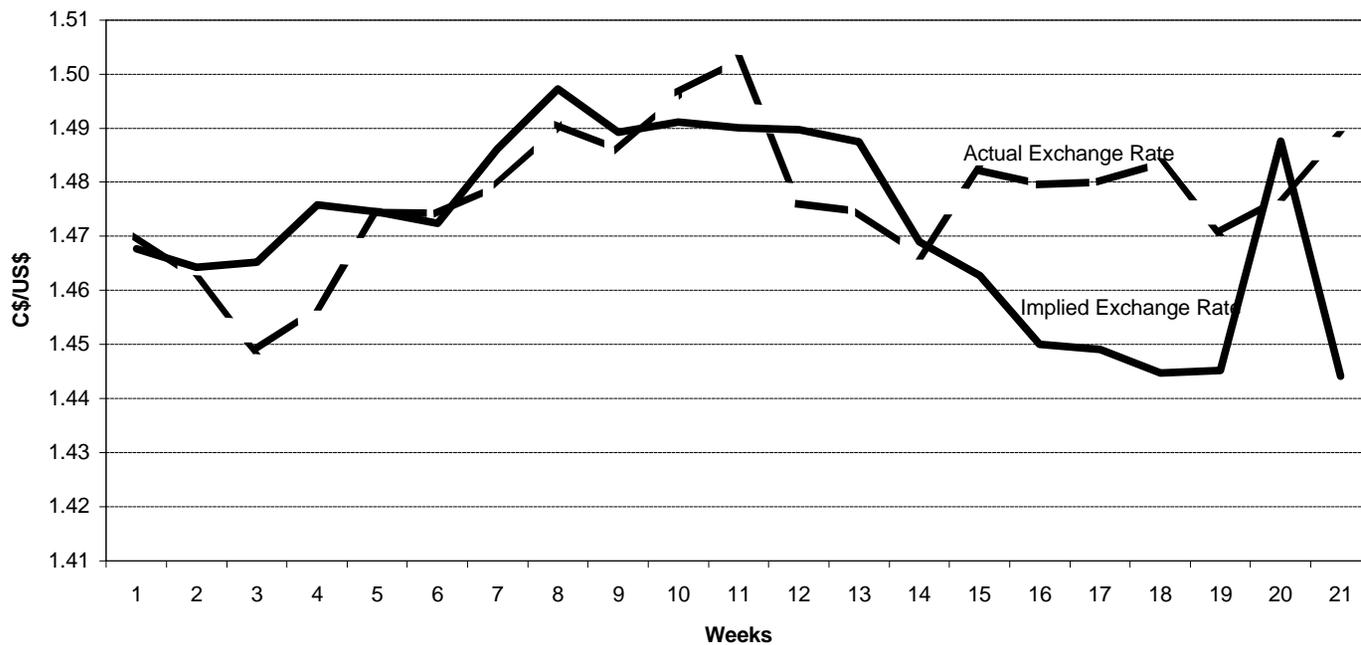


Fig.4: Actual exchange rate and Implied exchange rates  
(Ratio of average book prices in own currency: Chapters/Amazon)



**Fig.5: Scatter Plot of Amazon and Chapters Prices for 5125 Books (C\$)**  
(Average prices over 21 weeks)

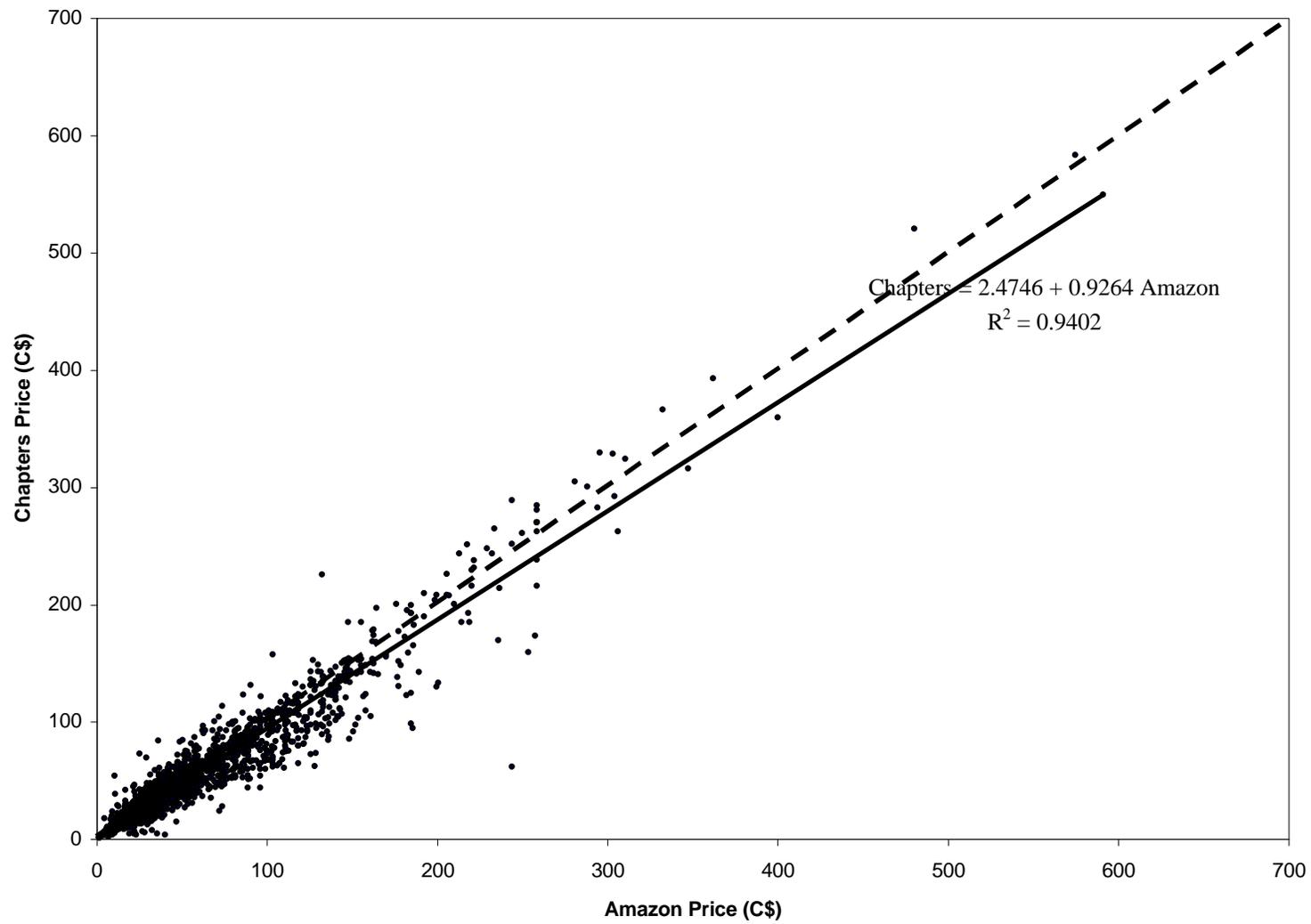


Fig.6: Price Difference (Chapters - Amazon) for different delivery categories:  
Value and Statistical Significance

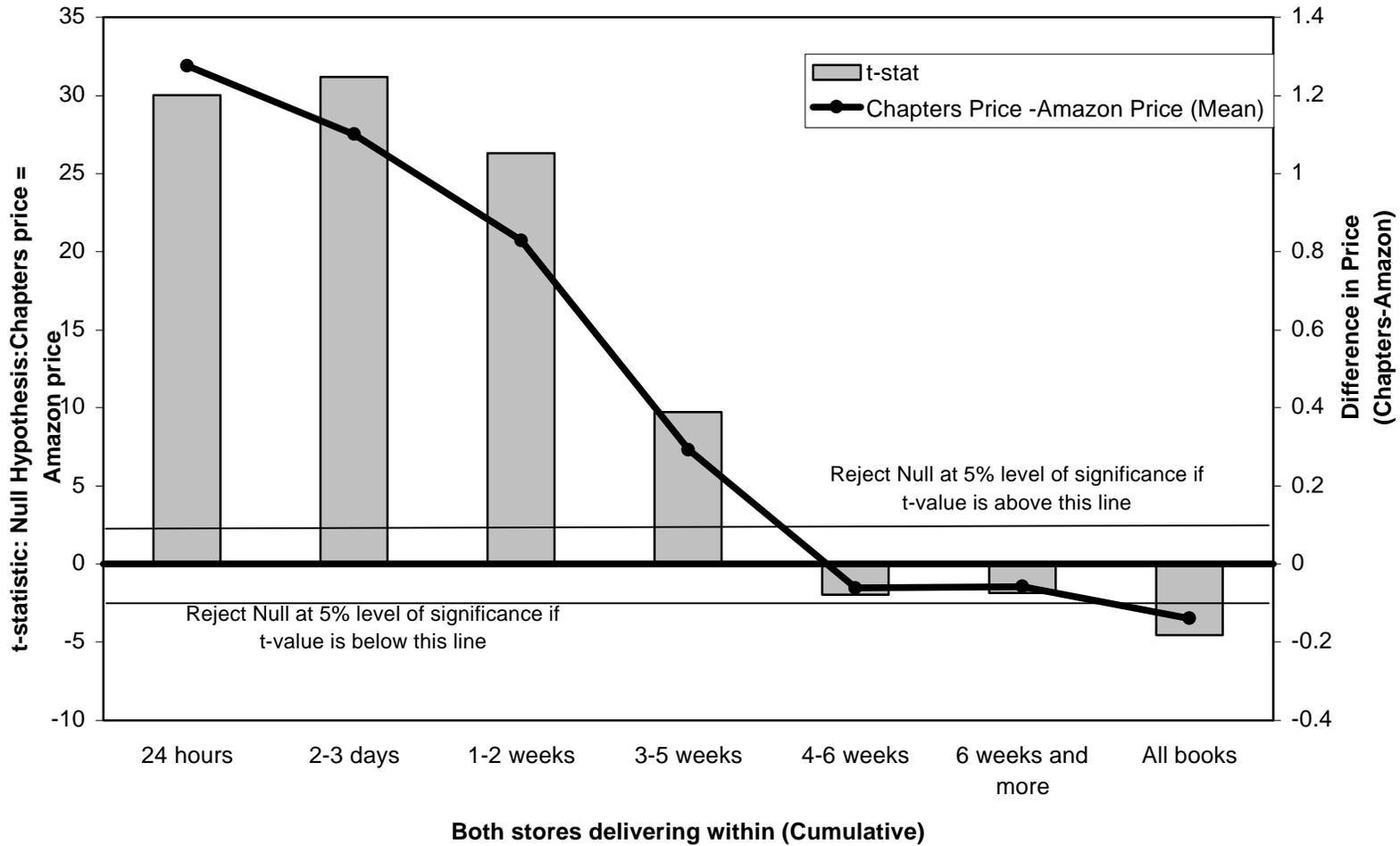


Fig.7: Price Difference (Chapters - Amazon) for different popularity categories:  
Value and Statistical Significance

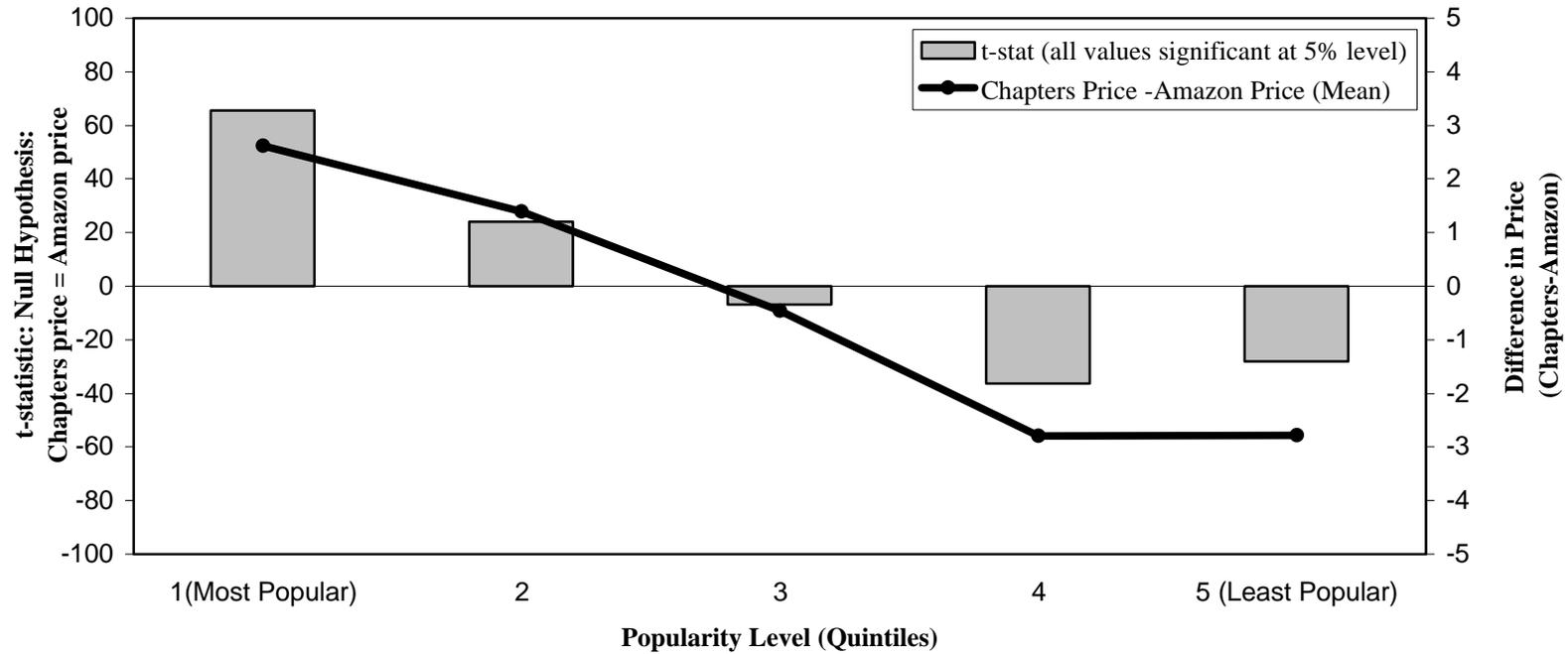
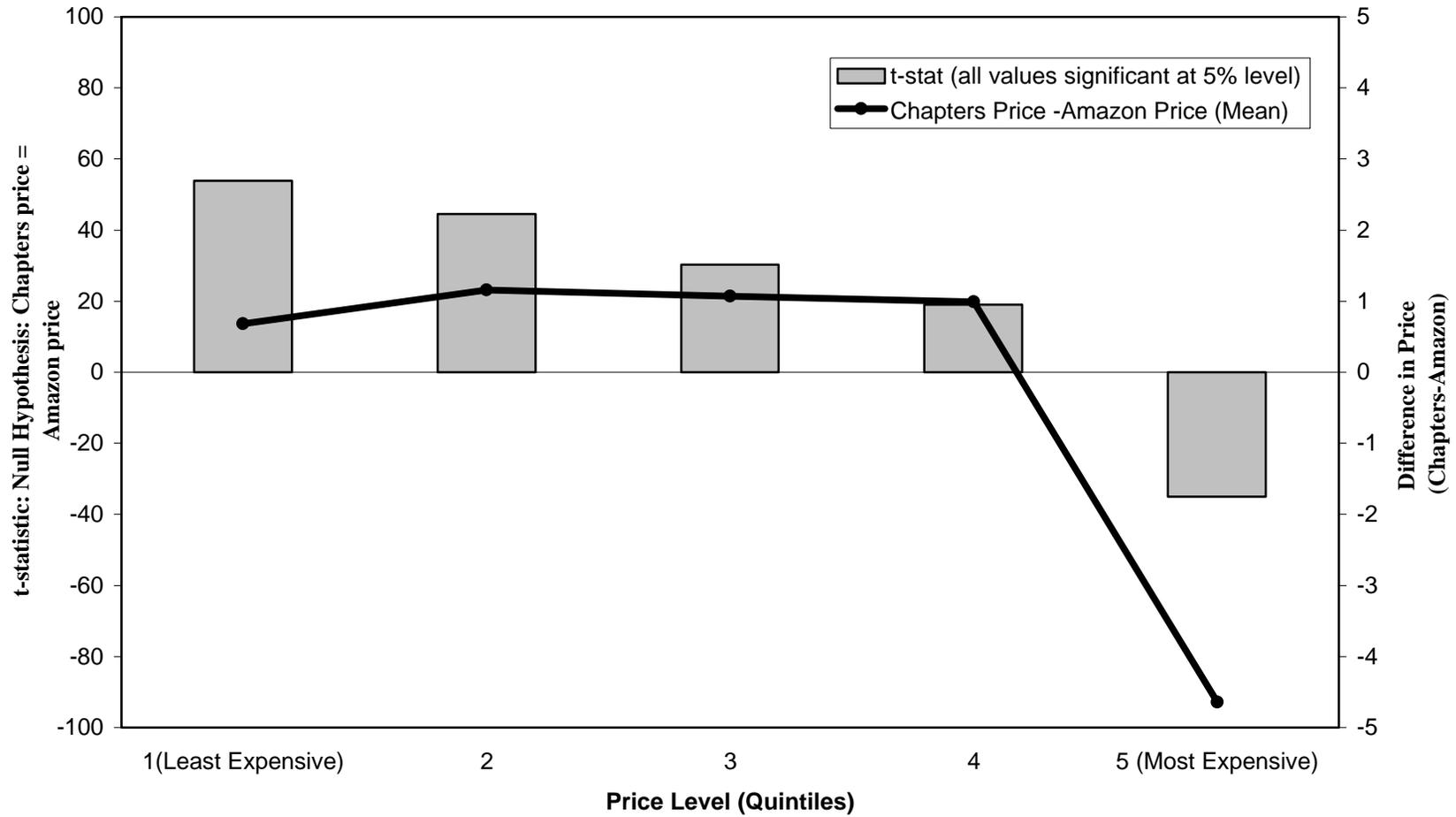
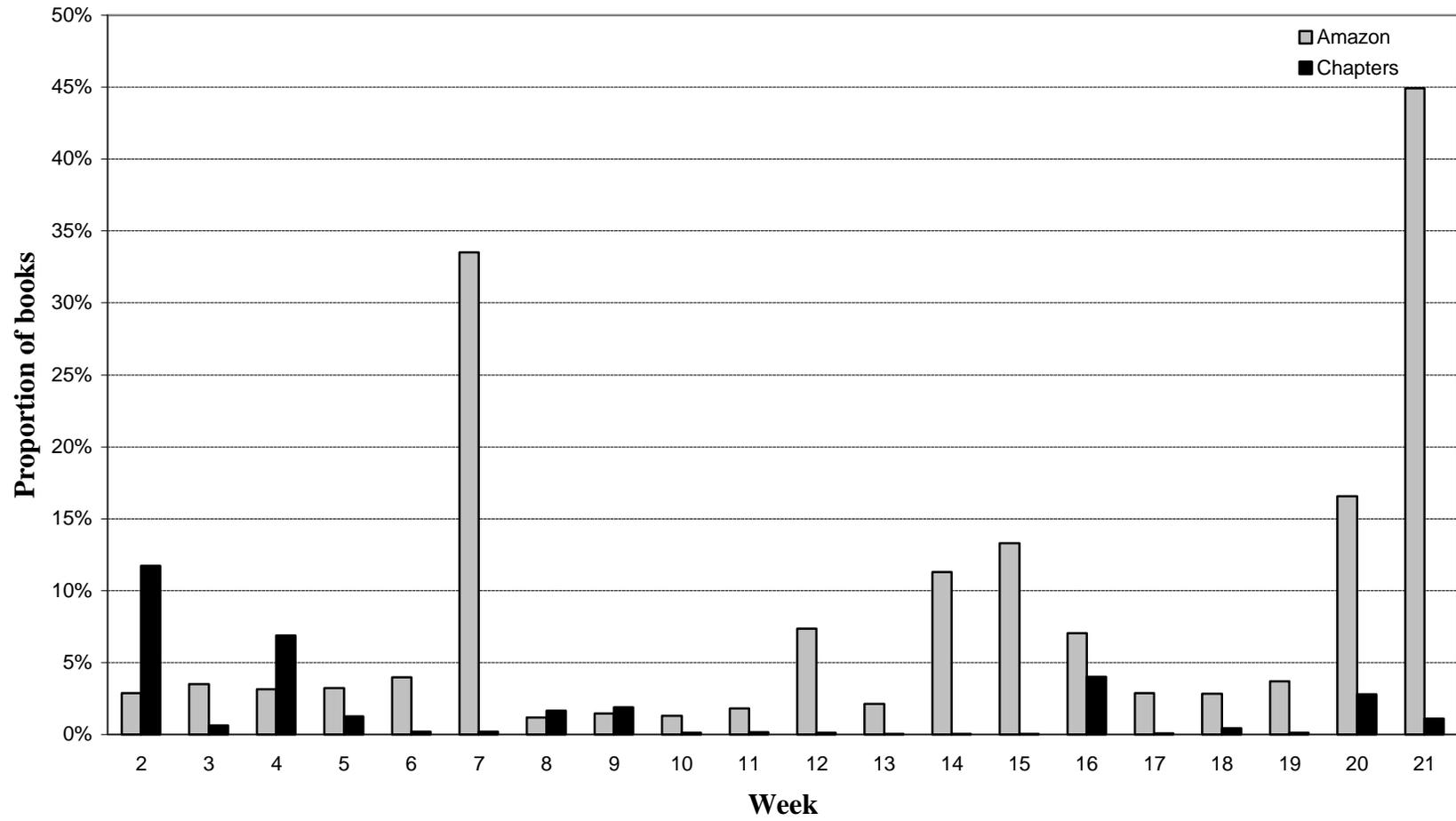


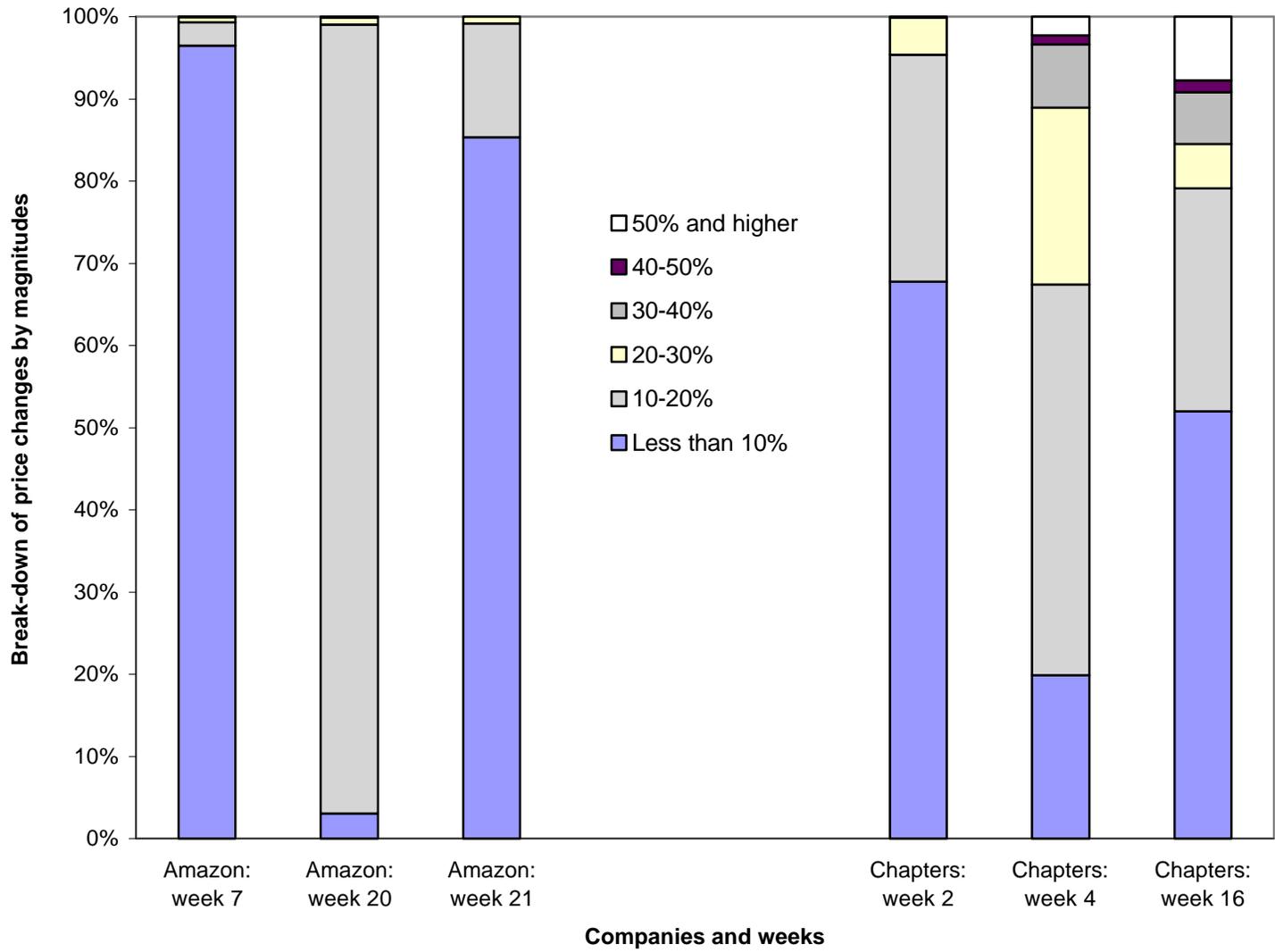
Fig.8: Price Difference (Chapters - Amazon) for different price categories:  
Value and Statistical Significance



**Fig.9: Proportion of Books which change in price from previous week**



**Fig. 10: Composition of price changes (absolute)  
in the 3 weeks with most price changes: Amazon and Chapters**



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<sup>1</sup> Shaw (2000)

<sup>2</sup> Chapters Online Investor Relations, [www.chapters.ca/ir](http://www.chapters.ca/ir).

<sup>3</sup> US Internet Council (2000).

<sup>4</sup> In 2000, the online book industry forms an increasingly important part of the book retailing industry and a Boston Consulting Group report predicts it will account for as much as 20% to 30% of all book sales by 2004 (Green (2000)).

<sup>5</sup> In 1995, one of the American chains, Borders, had put in place detailed plans for a major expansion of its “Big Box” stores into Canada. Barnes and Noble was also considering such a move. However in early 1996 Industry Canada (the Canadian Government’s industry ministry) announced that it would not approve the planned Borders expansion. (Corcoran, 1996) Under the Investment Canada Act of 1993, a foreign investment in a Canadian cultural industry should be Canadian “controlled in fact”. As noted by Corcoran, (1996), however, the Investment Canada Act does not define how much Canadian control is enough, leaving this primarily an administrative decision.

<sup>6</sup> US Internet Council, (2000)

<sup>7</sup> *ibid*, pg. 8.

<sup>8</sup> Watson (2000).

<sup>9</sup> Media Metrix, January 2000.([www.mediametrix.ca](http://www.mediametrix.ca))

<sup>10</sup> Hof (1998)

<sup>11</sup> Various SEC filings (10-K) available at [www.edgar-online.com](http://www.edgar-online.com)

<sup>12</sup> Chapters Online Annual Report 2000

<sup>13</sup> Shaw (2000).

<sup>14</sup> According to Kubas Consulting, as cited in Chapters Online Annual Report 2000.

<sup>15</sup> Chapters Online Investor Relations, [www.chapters.ca/ir](http://www.chapters.ca/ir)

<sup>16</sup> Pollara Internet Survey, “Canadian Internet Holiday Spending Exceeds Expectations”, ([www.pollara.ca](http://www.pollara.ca))

<sup>17</sup> The original address of this site was [www.evenbetter.com](http://www.evenbetter.com). However, during our study it was acquired by a more general comparison shopping site, DealTime.com ([www.dealtime.com](http://www.dealtime.com)).

<sup>18</sup> These categories are provided by the site itself. They are: Antiques & Collectibles, Architecture, Art, Biography & Autobiography, Body,Mind & Spirit, Business & Economics, Computers, Cooking, Crafts & Hobbies, Current Events, Drama, Education, Family & Relationships, Fiction, Foreign Languages Study, Games, Gardening, Health & Fitness, History, House & Home, Humor, Juvenile Fiction, Juvenile Nonfiction, Language Arts, Literary Criticism & Collections, Mathematics, Medical, Music, Nature, Performing Arts, Pets, Philosophy, Photography, Poetry, Political Science, Psychology & Psychiatry, Reference, Religion, Science, Self Help, Social Science, Sports & Recreation, Study Aids, Technology, Transportation, Travel and True Crime.

<sup>19</sup> [www.oanda.com](http://www.oanda.com)

<sup>20</sup> As is apparent from table 1, Amazon enjoys a similar but smaller advantage over Chapters in selling to US consumers.

<sup>21</sup> *Webpsych for Websites*, Devlin Applied Design, [www.devlin.ca](http://www.devlin.ca)

<sup>22</sup> A formal Granger causality test of the data in figure 8 fails to reject the null hypothesis of non-causality in both directions.