

E-commerce and consumer behaviour

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1. Introduction

One of the opportunities the growth of the Internet has provided is the ability for users to browse commercial products shown on the Internet, and in some cases to order them over from a computer. The act of ordering is called e-commerce,² and its growth has been a matter of much speculation. In this paper we look at its impact on consumer behaviour, and by extension, on price measurement in the CPI.

Because of some obvious advantages in convenience to the purchaser, expected cost advantages to the supplier in not having to maintain such a visible inventory and the opening up of more diverse markets for suppliers, e-commerce was predicted to grow quickly. In general it has grown quickly in percentage terms, though not nearly so fast as most predictions, but the latest figures show it to still be a very small percentage of consumer spending, and of business spending as well. In this paper we will concentrate on consumer spending; although business-to-business sales are about five times as large, they are still a very small proportion of business sales, and our main interest here is the impact that e-commerce has for measuring the CPI.

In 2001, e-commerce by private households in Canada was estimated at almost \$2 billion, more than a 50% rise from the previous year. Nevertheless, this amounts to only 0.4% of household expenditure. Even if we make an adjustment to express it as a percentage of discretionary spending (for most purchases over the Internet could be so described) it only rises to two or three percent. If e-commerce were one unitary commodity, its weight would be large enough to merit surveying in a CPI, but Internet purchases are distributed among a number of products, and the activity is still a small share of those as a whole, and most products individually. Information from retail trade surveys confirm this: in 2000 the percentage of retail goods sold on-line, or by mail order was about 1% of total retail sales, and even for those commodities most mentioned in e-commerce, books and CDs, the ratio was only about 10%.

For the present, therefore, the question is whether there are a few products whose trade over the internet is already sufficiently important to be included in our price measurement.

¹ The opinions expressed are those of the author only, and not those of Statistics Canada.

² Statistics Canada follows the OECD definition of e-commerce viz: "...sale or purchase of goods or services, whether between businesses, households, individuals, governments and other public or private organisations, conducted over computer mediated networks...". This definition includes orders placed over a network, regardless of whether or not the payment and delivery took place on-line.

Obviously there cannot be many, but these potential cases are discussed later in the paper. A more general question, is how is e-commerce likely to grow in the future, and will it soon be important enough to be measured directly in several areas.

Associated with these questions are the concerns about whether the existence of e-commerce and the way products are offered for sale might lead to changes in the way we measure prices, even if the extent of e-commerce is still not very large.

In this paper we will start by tracking the growth of internet activity and e-business activity in Canada and provide some assessment of its potential further growth. Then we will look in more detail into some of the more popular products that are bought on the web. Finally we will look at some other internet activities related to the delivery of products, and examine these implications for how we measure price change for them.

2. Overall growth in internet activity and e-business

Most of the following information comes from the annual Survey of Household Internet Use (HIUS), carried out by the Science, Innovation and Electronic Information Division (SIEID) at Statistics Canada. It began with the 1997 reference year and has increased detail since. Questions covering e-business and e-commerce date from 1999. The most recent available data is for 2001.

The amount of spending by households depends on three factors – the percentage of households that have access to the internet, the degree to which, having access, households choose to use it for buying particular products, and the range of products available.

Table 1 shows the percentage of households that have access to the internet, either at home or elsewhere, and some percentages that are internet shoppers³, either by window-shopping or engaging in e-commerce, and who pay for e-commerce electronically over the net. “Internet shoppers” include those who research product information without buying, “window-shopping”. We do not know whether household members listed as window-shoppers only ever intended to research product choices or whether they started with the intention of possibly buying over the net, but did not carry through with it. We do know that many people have concerns about security, and about reliability of delivery of products bought over the net. Most companies, knowing about peoples’ security concerns, make arrangements for payments for products purchased over the net to be made by other than electronic means.

Any analysis of e-commerce that spans the years 2000 and 2001 is compromised by the change in the question in 2001. Table 1, for example, shows that in 2000, 21.9% of all households engaged in Internet shopping from home. In 2001, 33.1% of all households engaged in Internet shopping from some location. We cannot know what proportion of that 33.1% did Internet shopping from home, and what proportion only from elsewhere. This

³ Internet shoppers: Regular-use households that engaged either in window shopping or electronic commerce. Window shoppers (only): Households where all members reported only to have browsed for goods or services using the internet.

Electronic commerce: Households where at least one member was reported to have ordered and/or paid for goods or services using the internet, for personal or household consumption. These households may have window-shopped as well.

Electronic payment: Internet households in e-commerce households who made an online payment for at least one of their transactions.

discontinuity makes it impossible to make any comparison between the two years, and Statistics Canada does not do so. Any observations about internet shopping and e-commerce in this paper are speculations based on guesses about the missing activity, or about patterns of behaviour between home- and other- access users.

Table 1: Percentage of households accessing the Internet

	1999	2000	2001
All households	100.0	100.0	100.0
From any location	41.8	51.3	60.2
From home	28.7	40.1	48.7
Internet shopper	15.3	21.9	33.1
Window shopper (only)	8.3	9.6	14.4
Electronic commerce	6.9	12.3	18.7
Electronic payment	5.3	9.7	14.8

Note: In 2001 the survey was redesigned to capture Internet shopping by households that regularly used the Internet from any location. In previous years it only captured shopping conducted from home. Thus there is a break in the series preventing comparisons between 2001 and earlier years.

2.1 Growth of access to the Internet

We know the volume of e-commerce has clearly been growing quickly, partly as more and more people get access to the Internet. Let us look at the potential for further growth as access increases.

Table 2: Growth of Internet access rates, and rate of access and internet shopping in 2001, by income quartile

	Percentage growth in households with Internet access				Percentage of households in 2001 with access to the Internet	Percentage of Internet users in 2001 who engaged in e-commerce
	1998/1997	1999/1998	2000/1999	2001/2000	2001	2001
All households	23.8	16.4	22.7	17.3	60.2	31.0
Lowest quartile	7.3	43.5	27.2	32.2	31.6	18.1
Second quartile	32.2	22.7	46.5	21.0	51.8	22.4
Third quartile	28.7	15.6	26.0	15.7	70.1	30.1
Highest quartile	21.4	9.5	9.4	12.1	87.3	41.6

Table 2 shows the percentage of households with Internet access in 2001, by income quartile, and the year-to-year growth of access for each income quartile. While the rate of Internet use has risen considerably in each year there was evidence that the rate of growth was beginning to ease off in 2001 and the limit to access is in sight. Three more years of 15% annual growth would put overall access over 90%. Furthermore, the potential for increased access is largest among the lower income households, whose use of e-commerce, when they do have access, has been lower than higher income households. While the percentage of internet users in the highest income quartile in 2001 engaging in e-commerce was 41.6, it fell through 30.1 and 22.4 to 18.0 for the lowest income quartile. If all households had the same access rate as the

highest quartile did in 2001 (87.3%) the number of households engaged in e-commerce, on 2001 rates, would only be 30% higher than in 2001, and the increase in value of expenditures would be rather less, as expenditures by lower income households would naturally be lower. It seems unlikely that there can be more than another 20% or so of growth in e-commerce in total due to increased access alone. Spread out over the next few years it suggests a low rate of growth per year.

2.2 Increased use by owners

The second impetus to growth in e-commerce could be increased use by households who have access. This may show as an higher percentage of users engaging in e-commerce, or more activity by those who are already buying. Table 3 shows how internet shopping and e-commerce rates have changed from 1999 to 2000 among households who have internet access at home, and rates in 2001 for all those who have internet access, from any location.

Table 3: Percentage of regular-use households with internet access engaging in internet shopping

	1999	2000	2001
From any location	N.A.	N.A.	100.0
From home	100.0	100.0	N.A.
Internet shopper	53.2	54.6	55.0
Window shopper (only)	29.1	23.9	24.0
Electronic commerce	24.1	30.7	31.0
Electronic payment	18.4	24.3	24.6

Because of the break between 2000 and 2001 we cannot make exact comparisons but if we make the extreme assumption that in 2000 no-one engaged in e-commerce away from home the figure for 2000, of 30.7% home-access households engaging in e-commerce, would only have dropped from to 24% if expressed as the percentage of households with any kind of access (51.3% of households instead of 40.1%, from table 1). Although the incidence of Internet users using it for in e-commerce is rising, the increase has only been moderate, and for those engaging in window shopping only, it has risen barely, if at all.

Although there may not be a higher proportion of internet users using it for e-commerce, perhaps those who are using it are using it more extensively. Table 4 shows the average size and number of orders. Again we have the problem of comparing between 2000 and 2001 as we do not know the difference in the number and types of order placed from home compared to other locations. The pattern of orders and the frequency of orders may be different between those who place their orders from home and those who place them elsewhere.

Table 4: Average expenditure and number of orders placed

	1999	2000	2001
Average Expenditure by households engaged in e-commerce (\$)	517	757	880
Average number of orders	4.1	6.2	5.9
Average expenditure per order (\$)	125	121	148

(1999 and 2000 orders placed from home; 2001 orders placed from anywhere)

From 1999 to 2000 there was a sharp increase in e-commerce users' frequency of use. This coincides with the increase in the percentage of users in 2000. But the increase in frequency of use was not sustained through 2001. It is quite reasonable to guess that some decline in the average number of orders is due to the inclusion of those who do not do their internet shopping from home, as it is probably less convenient, but even if we assumed there was no e-commerce except from home the average size of order would have risen only to 7.3, which we can take as an upper bound. The main cause of increased expenditure in 2001 was an increase in the average value of order, which may reflect a different mix of products being bought.

Taking the information from tables 3 and 4 together there does not seem to be a breakthrough in general usage by existing Internet users. We need next to look at the types of products offered and the way they are offered. One disincentive, security concerns, appears not to have changed in this period, and while it may deter potential buyers from even considering purchasing in the first place, three-quarters of those that do make purchases do it by electronic payment. (compare each year the bottom two lines of table 1).

The change in average order size in 2001 suggests that a different mix of products might be attracting orders than in earlier years. We can see this from Tables 5 and 6 that list the kinds of products that interest Internet shoppers. We have no data on expenditures by category – that would require an extensive and time consuming survey for respondents. These data are based on respondents who do conduct e-commerce saying that they either buy or window-shop in the various listed product categories. We have again the problem of non-comparability between 2000 and 2001. There were also some changes in product categories in successive years, which affects the content of “other” particularly.

2.3 Diversity of products

The make-up of what is bought has changed considerably between 1999 and 2001. The products are listed by their interest of the highest number of people in 2001. The products notionally associated with e-commerce – books, computer software and music – were the most important in 1999, but they have all fallen in importance since.

Table 5: Percentage of internet shoppers buying the following (e-commerce)
(Only those with 5% or more respondents in 2001)

Category	1999	2000	2001
Books, magazines, newspapers	37.5	36.6	28.1
Clothing, jewellery etc.	12.3	17.4	18.2
Travel arrangements	12.4	12.2	16.2
Other	12.4	21.4	14.8 (but see new categories)
Computer software	24.8	16.0	13.8
Music (CDs, etc.)	18.5	15.4	11.8
Other entertainment (tickets, etc.)	9.3	8.0	10.6
Consumer electronics	4.9	6.8	6.7
Computer hardware	9.0	8.3	6.4
Toys and games	2.3	6.1	6.1
Housewares	3.3	5.5	5.6
Sports equipment			5.5
Health, beauty, vitamins			5.1
Videos, video discs	5.7	5.4	5.0

To a large extent this is due to the greater diversity of products available. New users have not been so particularly interested in those products that were most important in 1999. The main products which have grown in importance are clothing, travel arrangements and, to some extent, tickets for entertainment.

What has happened to window-shopping has been quite different.

Table 6: Percentage of window-shoppers examining the following (Only those with 5% or more interest in 2001)

Category	1999	2000	2001
Books, magazines,newspapers	32.8	19.8	15.9
Clothing, jewellery etc.	23.3	28.9	25.6
Travel arrangements	30.9	17.0	16.3
Other	7.2	18.1	11.1 (but see new categories)
Computer software	26.6	13.5	10.7
Music (CDs,etc.)	22.6	11.9	10.7
Other entertainment (tickets,etc.)	14.0	4.6	5.1
Consumer electronics	19.7	18.9	21.6
Computer hardware	23.4	14.2	12.2
Toys and games	3.0	9.7	8.1
Housewares	13.9	17.0	26.4
Sports equipment			9.0
Health, beauty, vitamins			5.7
Videos, video discs	9.5	6.1	6.3
Automotive products	28.6	23.8	21.2

Here we find that (except clothing) the most important products for e-commerce have dropped dramatically in importance for window-shopping, more than can be explained just by diversification. It appears that for these products users are either prepared to buy, or not interested. On the other hand, there are some product categories that are very popular among window shoppers, but they do not want to make purchases on the basis of computer images or descriptions. (The categories are listed in the same order as in the preceding table, in descending order by importance in e-commerce in 2001). These products are clothing (to some extent), consumer electronics, housewares and most notably automotive products. But except for clothing, the increase in interest in window-shopping has not converted to internet sales.

2.4 Summary of overall activity

Growth in e-commerce in recent years has been driven more by increased numbers gaining access than by an increased propensity to use it by existing internet users. The growth in access is likely to slow considerably, and increases in usage have been only moderate, despite an increasing range of products for which e-commerce purchases have been made. Although there may be some exceptions, e-commerce generally is not likely to account for a large enough share of purchases for it to be necessary to cover it in price surveys; unless a seismic shift in households' perception of the value of internet shopping occurs.

3. Synopsis for specific products

Let us look at the more popular product categories in more detail. The following tables show the percentage of internet users who are window shopping or buying these products. It is an indicator of propensity only; the actual numbers of buyers has been rising as more and more households have had access. Except for clothing there has been a marked decline in the percentage of users window-shopping this was most noticeable between 1999 and 2000 when the questions were unchanged.. There appear to be two reasons for this: new users are less inclined to use the internet, and existing users either increase their amount of e-commerce or stop using the internet for those products. As for the trends in e-commerce, there may be specific reasons for the changes in each product, but there are only two categories – travel arrangements and clothing, which are clearly growing.

Table 7: Percentage of internet users shopping on the internet for books, magazines and newspapers

	1999	2000		2001
Window shoppers	9.5	4.7		3.8
E-commerce	9.0	11.2		8.7

Table 8: Percentage of internet users shopping on the internet for computer software

	1999	2000		2001
Window shoppers	7.7	3.2		2.6
E-commerce	6.0	4.9		4.3

Table 9: Percentage of internet users shopping on the internet for music

	1999	2000		2001
Window shoppers	6.5	2.8		3.3
E-commerce	4.4	4.7		3.7

These are the products that were the most important for e-commerce in 1999. In all cases (books less definitely because of the discontinuity problem in 2001) the likelihood of an internet user buying these products using the internet has fallen between 1999 and 2001. The drop in window-shopping has been much sharper. The number of households with the internet has grown, and it may well be that most of those who were most interested in these products had got access by 1999. However, current trends do not suggest any significant growth in e-commerce for these products. One caveat that past and current use may be underreported, especially for music and software, is that in the Survey of Internet Use, one household member reports on behalf of everyone in the household. That one person may not know of activities by other members of the household. The reporting in this survey will change from a household to an individual survey for reference year 2004, funding permitting.

Is there are chance of a sudden change in usage? In Canada until 2001 there were two Canadian chains selling books and some CDs over the internet and Amazon.com in the U.S. was also a potential supplier. In the year ending March 31 2001 Chapters reported online sales

to be 7.5% of total retail sales, up from 5.9% the previous year.⁴ The dollar increase in online sales and retail stores sales was virtually identical. The two Canadian chains merged into Chapters/Indigo in 2001; in the year ending March 2002 Indigo reported online sales were 5% of total revenues⁵. In 2002 Amazon opened a Canadian branch, eliminating the problems of conversion to US currency and of delays or extra charges through customs. It also provided more direct competition, which has been met by matching prices and promotions in most cases. It will be interesting to see if internet purchases have grown since mid-2002, but there is no evidence of online sales becoming significant anytime soon.

Implications for price measurement: In the Canadian CPI book prices are surveyed in a non-standard way. The top five best-sellers (with some restrictions) are priced in various outlets and the sum become the price for that month to be compared to the sum for the previous month, which may be, and usually is, for a different parcel of books. It would not be difficult to include internet outlets in the sample, and an estimate could be made of their share of the market. They tend to have lower prices than the same books in store, though not necessarily for best-sellers which are often discounted in stores too. In addition, the price of shipping has to be included; this varies according to the size of the order, so a view must be taken of the likely size of the purchase - a question which will be returned to later. This method, treating each outlet independently, does not make any comparison of price levels between internet outlets and other outlets, so that any effective price drop, if any after comparing the qualities of services offered, is not reflected in the index.

3.1 Travel arrangements

Table 10: Percentage of internet users shopping on the internet for travel arrangements

	1999	2000	2001
Window shoppers	8.9	4.1	3.9
E-commerce	3.0	3.7	5.0

Philip Wolf, a US analyst of the travel industry, described it a year or so ago as “the oasis in the e-com deseert”. It is the only product category that shows a marked increase in the percentage of users, although that percentage is still low. This area shows growth potential. Although booking of hotels and car rentals is included in this category by far the largest portion of purchases in this category is airline tickets. The airline industry, dominated and led in Canada by Air Canada, is trying to increase the amount of direct purchase over the Internet, either by travel agents or by households. At the end of 2000 it was 1% of bookings with Air Canada; a year ago they stated they hoped to raise this to 20% by 2005. Among predictions of e-commerce growth this is among the more conservative, and they are presently ahead of their targets.⁶ They are encouraging growth in e-commerce in several ways: increasing the use of electronic tickets (the only option for domestic flights now), advertising sale prices first on the Internet, giving modest incentives for booking that way, and making their pricing more transparent and straightforward. This is already in place with their discount arm Tango which can only be booked over the internet or directly from an Air Canada call centre. In recent months direct purchases by the consumer sector are averaging 7% of all ticket revenue, and

⁴ From Chapters annual report 2000-2001
⁵ From Indigo Books and Music, Inc. annual report 2001-2002
⁶ Information based on conversation with Air Canada representative, April 2003.

closer to 10% of all bookings, which implies a higher percentage of consumer bookings. They expect these percentages to at least double within the next twelve months.

Implication for price measurement: This is another product where our method of measuring prices does not depend on a retail survey, but on being provided by the carrier with prices under specified conditions for specific routes on certain dates. Although still a small fraction at present, internet sales look likely to rise, especially in the household sector. Internet sales can have a marked impact of the prices that should be used in the CPI, as pricing methods change. Air fares have been notoriously complicated with price discrimination and frequent changes in fares as the departure time approaches, so that it has been difficult to claim that a moderate sample survey captures prices adequately. Air Canada’s CEO recently stated that this complicated system cannot be maintained with prices posted on the internet, so there will be a simplification of the rate schedules that will make it easier to cover the product better. This does not mean constant prices; the pricing policy on Tango combines two new factors. First, flights are priced individually, so that a return trip can be planned by buying any combination of flights. Second, price will vary with demand. If a flight is selling quickly, its prices will rise, and if not, not. So someone who is flexible about their dates can get lower prices. Although the present method of collecting prices is cheap and easy, if we were replacing a retail survey it would be easy to survey the internet at certain times and take the prices from there. This means that we would need to specify the terms of sales more precisely, making some assumptions about consumer behaviour. A potential customer who can plan well ahead and is reasonably flexible about exactly which day to fly will find different prices from one that has to fly at virtually no notice.

3.2 Clothing and automotive products

Table 11: Percentage of internet users shopping on the internet for clothing

	1999	2000	2001
Window shoppers	6.7	6.9	6.1
E-commerce	3.0	5.3	5.6

Table 12: Percentage of internet users shopping on the internet for automotive products

	1999	2000	2001
Window shoppers	8.3	5.7	4.4
E-commerce	0.6	0.6	0.8

These are two product categories that are most popular for window-shopping. However, for clothing the internet is becoming steadily more popular. It is also an area where some retailers have lost a lot of money and withdrawn from the business. The companies that have been most successful with online selling are those that had successful catalogue sales before. It really provides an alternative to catalogue; and they never got large enough for them to include in our survey.

Implications for price measurement: Because many companies in effect post their catalogue on the internet there is the possibility of using these prices as proxies for field survey prices. The advantages are cost, and the knowledge that these are truly the price at which the good sells if bought over the internet. One disadvantage is that it may be difficult to evaluate

quality change, particularly for clothing, and prices may not be the same in the stores as online. There has been no study of this yet for the CPI, but we do know that instore prices do vary in different locations. The other difficulty is that it is one thing to check online prices against the field selected ones, where possible, and another to use the online prices to design the survey. We would be lacking the information in individual stores that enables the price collector to choose a representative seller. The best use of online prices may be as an editing tool to checking against the field collected prices.

3.3 Digital products

With the exception of clothing, most of the popular or growing products on the internet are products that can be delivered over the internet, or whose delivery depends little on retail service that can vary from store to store. For those products, it seems that consumers still prefer to see the products in person.

Some products, however, sometimes called digital products, are delivered directly to the customer's computer. Examples include music, gameware, computer software, and services such as courses taken over the internet. All these are included in e-commerce, but according to the survey none of them are yet large enough to demand direct pricing. There are some other products that owe their existence to the Internet and they will be discussed here, as they account for expenditure that is too large to ignore, and whether or not there are paid for over the internet aspects of the product are delivered over the net. These are internet access, banking and phone service.

3.4 Other products

3.4.1 Internet access

Most people with internet access from home purchases it⁷; in 2001 it accounted for 0.30% of consumer expenditure in the CPI, and a price index was added to the CPI starting in January 2003. For price measurement it is immaterial whether the service is purchased via e-commerce or not. All providers in the CPI price survey offer their plans via e-commerce, and their prices are collected from the net. The price index is calculated conventionally averaging the percentage changes in price as they occur, with adjustments for quality change in existing products.

3.4.2 Electronic banking

In 2001 44.4% of households with internet access at home used it to do electronic banking. This compares to 26% using it for purchasing goods or services. All the major banks in Canada offer the ability to bank on-line. Direct fees for banking services were included for the first time in the CPI in January 2001, with a weight of 0.51%.

Bank services in Canada can be paid for individually, or in a package of common services. Banks offer many plans, "tailored" to different customers needs. Some of these plan include electronic banking. Most people subscribe to one of these plans, paying a monthly fee, which is sometimes augmented if they use more than is included in the plan. For example if the plan includes forty debit card transactions a month and the customer makes 42, there will be a charge for each of the extra ones. Given the array of different plans it is difficult to select which ones to include in the sample without knowing the customer's preferences.

⁷ A significant proportion have access provided by their employer.

So this index is produced by defining some customer profiles, and calculating, from among the plans each bank offers, the cheapest combination to provided the required services. For these profiles, it is assumed the customer will stay with a particular bank, but will switch plans efficiently. This means that if plans change their content, a different plan may well replace the previous one for a particular profile. Given unchanging requirements, this will be a straight price change. However, maintaining the index will also require that the profiles are reviewed regularly, and then a change is made in the requirements in a profile the value of those changes must be evaluated. For example, if a plan that is the cheapest for one profile adds internet banking access at no extra cost, but the profile does not include it, there is no change in quality or price. However, if a profile is changed to reflect the need for electronic banking, the value of that in any plan that is chosen must be assessed as a quality change.

3.4.3 Phones, particularly cellular phones

The growth of cellular phone use (43% of households reported expenditures in 2001, for 0.50% of consumer expenditure) has also led to a growth of plans, most of which are available over the internet. There is a similar range of plans for long-distance service on landline phones, but only cellular phone service is discussed here. For cellular phones there are hundreds available, and at least one company will offer a custom plan to match any a particular customer may have found elsewhere. There are two ways of paying for cellular phone service, pre-paid and post-paid. Prepaid service is bought by buying credit, using it, then buying more when, or preferably before, it is used up. How fast that happens depends on the type as well as the volume of calls made. The standard way to do this used to be by a physical card, but now credit can be bought over the internet from companies' websites. There are also a variety of additional services which can also be charged to that credit. Postpaid plans work similarly, except there is a monthly charge for services, which is paid whether they are used or not. These plans do not have to be bought over the internet, but companies are trying to make it easier to do so. Again, this aspect of e-commerce does not show in the e-commerce surveys, but appears to be growing fast.

As with banking, it is difficult to select a representative products, or even a representative bundle of products from each supplier. The range of services each offers is virtually identical, and can be parcelled in almost any way. It is necessary therefor to focus on the consumer, and what is a representative package of preferences. This package can then be priced by the various suppliers.

How the prices are combined into the index depends on the profile. With prepaid service it is very easy to switch from one plan, or one supplier to another as the value of a card is used up. For the customer who does that it is appropriate to select as the price, the lowest price offered by any supplier. Pre-paid has been growing at the expense of post-paid plans, and suppliers are trying to reverse that trend. As they do not want to compete on the direct price of service, they have been introducing "loyalty" incentives, a lower phone price if you commit to purchasing enough credit over the next specified period, for example. Loyalty incentives already exist for most post-paid plans. So what range of prices, from what suppliers depends on what is specified in the profile concerning the willingness to switch plans.

4. Summary

What is common to these products, to travel, and to some extent to books and CDs, is that we need to reverse the standard for of field survey. Instead of selecting representative commodities from the range of different products whilst indifferent to the purchaser, we have

to select a representative purchaser of a range of undifferentiated products. This means that we might compare directly products from different supplies in compiling an index.

For phone service, where the cost and inconvenience of switching is small, all price offers might be considered and the lowest one used. (This is already the practice for contracted construction work). For the supply of books or CDs over the internet, where the products are identical, the lowest price would be selected, assuming the customer is indifferent between suppliers. These would depend on the perception of differences in the quality of service different suppliers provide, and ancillary costs. For digital products these differences may be small, but even for other products this approach may be suitable.

For example, there are three alternative carriers within Canada on many domestic routes, Air Canada, its discount arm, Tango, and Westjet. They do not provide the same services, and many users might judge the difference in services not justified by a difference in price. (Though we have never adjusted for any difference in service over time.) However, it is quite possible that a consumer will be quite indifferent between suppliers for a small difference in price, and the profile should reflect that. The difficulty, of course, is to devise representative profiles.

This reversal of focus arises because the point of purchase has moved. The shopping model is no longer of choosing one retail store over others and selecting from its products, but the computer. When different products have different characteristics this does not matter, but for relatively homogeneous products it does. Furthermore, most of these products are a bundle of different services which can be bought in many combinations. As the products are identical among suppliers, or, if different, one supplier can be easily substituted for another it is the consumer's preference, not the range of products available that is most important. So instead of monitoring the price of a representative product and adjusting for quality change we should monitor the price of a representative consumer's bundle of requirements, and adjust for quality change when we change the representative consumer.

This situation is not unique to digital products, it applies to the class of products that are delivered by a common system – conventional phones, natural gas, electricity – but the growth of digital products on the internet has highlighted it.

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