

Electronic Commerce

The Canadian experience in measuring electronic commerce in service industries

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Introduction

The digital economy has transformed the way in which many economic transactions occur. Traditional electronic commerce, i.e. e-commerce, is now used broadly by the business, government and household sectors, but the enabling technologies and e-commerce delivery modes are continuously evolving. Digital platforms are changing the way goods and services are provided, delivered and consumed, and facilitating new activities and business models. Although the impacts of digitalization are still not fully understood, our current concepts and methods for measuring output and prices are being challenged.

At the same time, consumer confidence and acceptance of technology are growing, logistics for delivering goods to households are becoming ever more efficient, and the sheer selection of goods and services available online is immense. As a result, consumers, and businesses, are taking full advantage by purchasing more and more online.

For statistical agencies, all of this means new demands for information, as data users want to know who is selling online, who is buying, how much and from where. They want to understand changes in spending behaviours, as well as how businesses (and households) are transforming their operations to enable e-commerce. In order to measure e-commerce in the statistical system, we need to know how and where to classify it – which industry and product, and which sector of the economy these transactions are attributed to.

In 2016, Statistics Canada produced a paper demonstrating the complexities of measuring digital cultural products in the face of continuously evolving digital technology¹. This paper expands on this earlier work to discuss some of the measurement issues, challenges and solutions in classifying, collecting, compiling and disseminating e-commerce statistics for the service sector, as well as the issues with respect to national accounting and prices.

1. Concepts and classification

In order to accurately measure e-commerce activity, we need to understand what it is, and what it is not. The definition of e-commerce used by Statistics Canada's economic surveys is consistent with the principles of the OECD standard adopted in 2009. Online e-commerce sales are defined as *sales of goods or services where the order is received and the commitment to purchase is made via the Internet, even if payment is made by other means. This includes orders made on web pages, through an extranet or by electronic data interchange over the Internet.*

¹ Statistics Canada (2016), "Measurement of Digital Culture Products at Statistics Canada", paper presented by Lucy Chung, Demi Kotsovos and Mark Uhrbach at the International Symposium on the Measurement of Digital Culture Products, May 9-11, 2016.

http://www.colloquemesurenumerique.stat.gouv.qc.ca/actes_an.html

1.1 Interpreting the definition of e-commerce – the activity

A key concept within the definition of e-commerce is the word 'commitment'. There needs to be a concrete Internet based commitment on behalf of both the consuming and producing entities to consummate the transaction. If this online bilateral commitment occurs, the resulting transaction is counted as an e-commerce sale.

This is an important distinction to make as consumers often use the Internet to 'window shop' for a product and price, and then take this price to a vendor to have it matched. But obtaining a price online is not in itself a commitment to purchase. For example, a consumer can go to an automotive website to obtain the price for a customized vehicle. If the consumer takes this price to the dealership to finalize the purchase, this would not be deemed an online purchase since there was no online order or commitment from the consumer. It is important to ensure both survey respondents and survey collection staff are provided with clear definitions and reporting instructions, as well as training material to ensure the activity is accurately reported, interpreted and measured by Statistics Canada.

The following are some of the questions asked of Canadian businesses from the Survey of Digital Technology and Internet Use 2013. The survey covered private firms in almost all industrial sectors with the exception of the following NAICS subsectors: 111, 112, 114, 1151, 1152, 238, 55114, and 814.

All firms, except for very small firms, were included in the target population. Enterprises that had under \$100K or \$250K in revenue, depending on the sector, were excluded from the population frame.

1.2 Applying the industry classification

The industry classification is an important consideration as it is the basis for reliable collection of e-commerce data and measurement of digital culture products. The North American Industry Classification System (NAICS) is used to classify businesses engaged in various economic activities, such as e-commerce, into different industries. Three main industries are discussed here, due to the fact that they are the industries most impacted by e-commerce: retail trade, publishing and related services, and industries impacted by the proliferation of peer-to-peer platforms.

1.2.1 Retail trade

According to the NAICS, a business that sells products online but doesn't have a storefront is classified as a non-store retailer. Likewise, under the International Standard Industrial Classification (ISIC) Rev. 4, online retailers are classified to ISIC 4791, Retail sale via mail-order houses or via Internet. These businesses are often referred to as 'pure-play' online retailers. There was a time when pure-play retailers were easily distinguishable from those who operated storefronts, but this distinction has become blurred. Many traditional 'brick and mortar' retailers, i.e., those with a storefront, now also sell online. And some pure-play retailers have opened storefronts to enhance brand recognition and make it easier for consumers to return or exchange products purchased online.

These evolving business models have created challenges for the classification of Canadian retail businesses at the establishment level. If a traditional brick and mortar business sells online, then a profiling activity needs to occur to determine if turnover, employee and expense data can be separately collected for the online activities. If the answer is yes, a separate entity will be delineated on the Business Register and it will be assigned to the non-store retail industry. If, on the other hand, only e-commerce turnover statistics are reportable by the business, then the online component of the business is deemed a secondary activity and its economic value added is embedded with the store-based operation. In this case, no separate entity will be identified on the survey frame.

Although this makes sense from a classification perspective, it can make it difficult for users to interpret the resulting data. In Canada, some data users would prefer to have separate e-commerce statistics for brick and mortar retailers and pure-play retailers. But since the non-store industry can contain brick and mortar retailers with separately identifiable online business operations, the non-store statistics are a mix of both types of businesses. By the same token, the store industry statistics will only include e-commerce sales for those stores that do not maintain a full set of accounting records for their online operations. These statistics will not represent all the retail e-commerce sales of store-based retailers.

In an effort to better measure retail sales over the Internet, Statistics Canada recently added an e-commerce sales section to the Monthly Retail Trade Survey:

Total retail sales

3. Please report the **total retail sales** for this business for the current reference period.

Report all dollar amounts in Canadian dollars (CAN\$).

When precise figures are not available, please provide your best estimates.

Include revenue from:

- Internet sales.
- Sales of any goods including value of trade-ins (net of returns and discounts).
- Repair and maintenance (including parts and labour).
- Rental or leasing of goods and equipment.
- Services (including food services).
- Goods manufactured as a secondary activity.
- Fees earned from commissions (e.g., lottery or bus tickets, phone cards). Do not report sales values.
- Orders made by mail, telephone, catalogue and facsimile.

Exclude:

- GST, HST, PST and QST.
- Non-operating revenue such as interest or dividends.
- Revenue from rental of real estate, placement fees, operating subsidies, grants, royalties or franchise fees.

CAN\$

\$1200

Total retail sales

\$.00

Internet sales

4. Did this business make any **Internet sales**?

Internet sales are those where the customer places the order and makes the commitment to purchase online. Payment may be made by other means.

Include: orders made in web page, extranet or electronic data interchange (EDI).

Exclude: orders made by mail, telephone, catalogue or facsimile.

\$1000 1 Yes

2 No ► Go to question 6

5. How much of **total retail sales** that you reported in question 3 was from **Internet sales**?

- Enter in Canadian dollars.
- If precise figures are not available, provide your best estimate.
- Enter '0' if there were no Internet sales.

Include: orders made in web page, extranet or electronic data interchange (EDI).

Exclude: orders made by mail, telephone, catalogue or facsimile.

CAN\$

\$1400

Internet sales

\$.00

In addition, work is underway to determine if the now blurred distinction between non-store and store retailers necessitates a change to the industry classification. For example, one option would be to eliminate the distinction between store and non-store retail establishments. The idea would be to classify businesses according to the types of products they sell, regardless of

the method used to sell them. Of course, statistics on method of sale (in-store vs online e-commerce vs other) would continue to be collected and disseminated so that the evolving retail business model could be analyzed.

Another option for industry classification is to restrict the non-store industry to the “pure-play” retailers, who historically have had a different operational structure than their store-based counterparts. However, as mentioned, some of these pure-play businesses are now opening storefronts. Needless to say, there are several industry classification challenges resulting from the digital economy, and e-commerce in particular, and those who measure e-commerce activity will need guidance as to the best way forward.

1.2.2 Publishing and related services

As with the retail industry, the NAICS has also presented some challenges with respect to other service industries, particularly publishing and broadcasting. At the time of the development of the classification system in 1997, digital technology was far less prevalent and complex than it is today. At that time, activities that were exclusive to the internet were considered distinct industries and classified in one of two NAICS industry groups, either 51821 – Data processing, hosting, and related services, or 51913 - Internet publishing and broadcasting, and web search portals. Initially, relatively few businesses were classified in these industry groups. However, as digital technology became increasingly common, more and more businesses were being assigned to these two industries. Eventually, they became a catch-all for any business with an online presence or Internet-related component, thereby losing their effectiveness in terms of providing a relevant level of industry detail.

For example, a newspaper publisher that once published physical newspapers but then moved their entire activity online, publishing only in digital format on the internet, would change industry classification from 51111 – *Newspaper Publishers* to 51913 – *Internet publishing and broadcasting, and web search portals*. Therefore, while this business was inherently producing or providing the same good or service, it was being classified according to the new format of the good or service produced.

Therefore, in order to accurately measure the economic activity of industries involved in the sale of digital products, NAICS 2017 has been updated, now classifying businesses according to their main business activity, regardless of their product format. Within the service sector, this will have a significant impact for the Newspaper Publishers, Periodical Publishers and the Software Development and Computer Services surveys.

In addition, there are a few exclusions that present measurement challenges. The culture industries surveyed by Statistics Canada mainly consist of producers, publishers, distributors, exhibitors and performers. Therefore, retail sales from downloads of musical recordings are not included in the revenues reported for sound recording industries, and are instead reported in the Annual Non-Store Retail Survey. However, the royalties from downloads are reported as part of revenues in the sound recording industries.

Similarly, revenues of online streaming companies are not captured in the sound recording industry or motion picture and video distribution or exhibitors industries. Instead, these online streaming companies are captured as part of the broadcasting industry. However, revenues from licensing of rights to stream sound recordings online are reported as part of revenues in the sound recording industries. These exclusions should be considered when trying to produce relevant measures for these industries.

1.2.3 Industries impacted by peer-to-peer platforms

Some industries, such as airline booking, hotels and taxis, are being transformed by the proliferation of digital platforms and online marketplaces, and it's likely that this transformation will continue to expand to other service industries. The new platforms act as an intermediation service, facilitating online transactions and payments between buyers and sellers. These services can be peer-to-peer, imported from platforms operating outside of Canada, or through another service provider. The main challenge is that it is often difficult to distinguish between these and traditional e-commerce, and more than likely these services are not being accurately captured and/or classified in the statistical system.

1.3 Product classification in the digital economy

The North American Product Classification System (NAPCS 2012) is the standard used by Statistics Canada to classify product data (goods and services). As an example, 'NAPCS 741 – Online content' comprises online news and information; internet radio subscriptions; online subscriptions to games; online subscriptions to software; and other online content. NAPCS 2017 will soon be implemented by statistical programs (January 2018) and has been updated to classify products according to their purpose and sub-divide them into digital and physical types, rather than classifying by their format.

In addition, the Canadian Framework for Culture Statistics (CFCS) defines culture as “creative, artistic activity and the goods and services produced by it, and the preservation of heritage.”² The CFCS does not offer a distinction between a physical culture product and a digital culture product, however they are in scope (i.e. identified as culture). For the purpose of this paper, digital culture products refer to culture products that are intangible and can be stored, accessed or received in an electronic format.

Despite the growth and spread of technology in services, digital culture products currently account for a small fraction of total revenue in some culture industries. This has caused some concern, as questionnaire testing revealed that many smaller businesses were unable to provide estimates because their accounting practices do not separate the digital and physical sales.

An important distinction is the one between revenues generated via digital transactions, i.e. those related to the nature of the ordering process, and revenues generated by the production and sale of digitally delivered products such as music and e-books. Sales of e-books are sales of *digital products*, whereas online purchases of either e-books or physical books are both

² CFCS 2011 and updates the CFCS 2004.

counted as e-commerce sales. Though digital transactions and the sale of digital products are distinct, they are not mutually exclusive, and can frequently occur simultaneously. For example, if someone purchases an e-book online, this is considered both an e-commerce transaction and the sale of a digital product.

Finally, another conceptual challenge since the proliferation of digital formats is the ability to capture the number of digital products sold. At this point, there is no standard due to the variety of potential formats available. For example, if a digital music recording is available for download, does each download count as one unit of product sold? If it is available for streaming, does each incident of streaming count as a unit of product sold? Therefore, we need to be clearer on how sales of digital music recordings are counted. In addition, as the methods of delivery evolve, such as the emergence of streaming, it is important to ensure that the measures evolve as well in order to capture these changes.

Similarly, varying definitions of what is considered a paid product and how these products are distributed adds to the complexity of capturing data on digital culture products. At this point, there is no standardized method of keeping track of digital product sales due in part to the wide variety of available contracts and bundles. For example, with magazine subscriptions, some periodical publishers include a free digital version when one subscribes to receive the print version. However, other publishers who have subscriptions including both a physical and digital copy, may allocate a portion of the revenue to the digital version. Therefore, even with a clear definition, current business models may not differentiate between the various categories available.

The example of broadcasting can be used to illustrate some of these points. Capturing the economic value of internet broadcasting is more challenging than collecting information on traditional broadcasting because streaming is not subject to the same type of regulation³. If regulations were such that a license was required to distribute content over the internet, this may allow for the collection of data from Canadian broadcasting companies. However, it will continue to be a challenge to obtain data from multinational businesses that have no physical Canadian establishments but are able to offer their services to Canadians through the infrastructure of the Internet as it is difficult to identify them and compel them to report.

In order to understand and begin to find solutions to the industry and product classification challenges, it is important to keep abreast of new developments, by communicating with stakeholders, respondents and others within the service industries. Efforts have been made to more accurately measure sales from e-commerce and digital culture products sold by the service industries, by testing new questions on e-commerce and updating the relevant questionnaires. Work has also been advanced on the household side, with questions added to the Labour Force Survey fast-track option in 2016 to collect information on household sharing economy activities, such as Uber and Airbnb (see section 4.4). A separate supplement is undergoing questionnaire testing this fall to assess the feasibility of gathering information on household expenditures and use of digital products.

³ Public Notice CRTC 1999-197, Ottawa, 17 December 1999 (<http://www.crtc.gc.ca/eng/archive/1999/pb99-197.htm>) and Broadcasting Regulatory Policy CRTC 2009-329, Ottawa, 4 June 2009 (<http://www.crtc.gc.ca/eng/archive/2009/2009-329.htm>)

2. Coverage of e-commerce statistics

One significant challenge in producing e-commerce data is to generate statistics that cover the wide scope and breadth of online transactions. In releasing statistics for the monthly retail trade program in Canada, much effort went into producing and making accessible documentation to convey what was covered by the statistics and what was not.

For example, it is important to distinguish between the retail sales of some of the large, foreign-based e-commerce giants, and the e-commerce sales of Canadian retailers. Unless an online retailer has domestic Canadian retail operations, it is not included as Canadian retail, even if the business has significant support networks (e.g. fulfillment centres in Canada).

If an online retailer has a Canadian location that operates as a retail business, it is counted as a Canadian retail operation. If it does not, it will not be included in estimates of Canadian retail sales, even if the retailer has significant sales to Canadian consumers, a website ending in .ca, or even logistics, warehousing, or shipping services that are based in Canada.

In addition, many common e-commerce transactions are not part of the retail industry. Booking travel accommodations, purchasing tickets and making financial transactions are all often done online via e-commerce, but these types of purchases and transactions are not covered by the retail industry in Canada. In the industry dimension, they are in the service and financial intermediary industries.

To address these gaps, an e-commerce section was added to 22 surveys for service industries, including the Travel arrangement and Traveller accommodation surveys in order to capture the online spending in these areas. E-commerce data for reference year 2016, such as sales by industry and methods of sale used in the service sector, are planned to be released in March, which will fill in some gaps in e-commerce statistics in Canada.

When a Canadian consumer makes an online (or offline) purchase from abroad, Canadian taxation authorities expect that the appropriate duties and taxes will be paid for any purchase with a total value of more than \$20CAD. This is known as the *de minimis* rule. In practice, these payments are not always made, which leads to difficulty in estimating the value of online imports. The appropriate cutoff level at which the taxes and duties become payable is the subject of debate between consumers and suppliers, as well as a topic in upcoming North American Free Trade Agreement (NAFTA) negotiations.

2.1 The geographic dimension

Although the Canadian Internet Use Survey (CIUS) captures sub-national e-commerce purchases by households and individuals, e-commerce statistics for retail trade are published for the country as a whole. Of course, the data users have expressed a desire for more granular estimates, but due to measurement constraints and reporting burden concerns, this remains a data gap.

One major challenge faced in producing sub-national statistics is that Canadian retail businesses have different methods for allocating their e-commerce sales to stores. Some retailers will allocate all on-line purchases to their head office establishment, while others will

allocate to the store nearest the purchaser. Statistical agencies must consider how to standardize the method for reporting sub-national on-line sales and then implement the standard in the collection vehicle. However, asking businesses to provide data in a manner that does not align with their accounting practices may result in lower response and poor quality information.

In addition, even the same retailer may use different methods for delivering the on-line product sold to the consumer. Sometimes the product will be shipped from a fulfillment center owned by the retailer, while other times it will be shipped from a third party fulfillment center. In other instances, the product purchased on-line may be picked up at the nearest store by the purchaser. For these reasons, tracking on-line sales by the geographic region where the product is sold, the region where it is distributed from and the region where it is delivered to is extremely challenging.

To simplify reporting for respondents, the monthly and annual retail trade surveys in Canada do not make an effort to collect on-line sales at a sub-national level. Instead, there is one question to collect all e-commerce sales for all stores in the country.

3. Issues for Services Producer Price Indexes (SPPIs)

The mismeasurement hypothesis (OECD 2016) suggests that the downward trend in productivity growth can be explained by the fact that the output of the digital economy is not being picked up by GDP and productivity figures. In fact, most would claim that the digital economy has raised productivity, and that statistical measurement has not kept pace with this progress. This creates significant challenges for prices, and in turn the volume based measures of GDP and productivity. Guidance will be needed in the following areas, which are mainly tied to the issue of price vs. quality change in the context of the digital economy:

3.1 E-commerce vs. in-store prices

One of the most important elements of price indexes is that they measure price changes over time for the same quality of good or service. In considering the expected impact of the digital economy on productivity it may not always be clear what is a quality change vs. a new product. Take as an example a product whose online price differs from the in-store price. This occurs because shipping fees or other commissions may be embedded in the online price, because consumers are willing to participate in the intermediation activities themselves (i.e. booking their own travel arrangements), or because the online retailer has greater competition than the brick and mortar store in terms of both price and terms of delivery (for example, Indigo.ca may offer the same product at a different price than the local Indigo retailer in order to compete with Amazon.ca on price and delivery). In price measurement, it is unlikely that we would link a store price to an online price but rather treat each as a distinct item measured in the price index. The quality is different between the two regardless of whether you consider quality change as a measure of utility or of the production process.

For example, consider the price of an airline ticket. The airline that once sold its tickets primarily through travel agents and tour companies may now sell the majority of tickets directly through its own on-line platform. What is the change in utility from the services of a travel agent vs. the ability to access all information directly online 24-7? This may be a quality improvement for a computer literate customer but a reduction in utility to someone with limited access to the Internet. From a production function perspective, the airline once received less of the overall ticket value per seat after paying a commission to various third parties but now assumes the costs to offer and maintain an on-line e-commerce platform, many of which have decreased as the technology has evolved. The airline is likely paying a different third-party for bandwidth, storage and a secure financial transaction interface. Either way you look at it, there is a difference in quality between the two transactions even if the fundamental air service remains the same.

So if we accept that online products are different than in-person transactions, it stands to reason that the price movements of each may differ. Ideally, we should be measuring both types of transactions and weight them by prevalence in a given industry. This can be problematic in terms of resources, response burden and access to weights. In fact, Canada currently excludes e-commerce prices from its Retail Services Price Index (RSPI) while relying solely on internet prices for traveler accommodation.

Extending this example further, e-commerce may result in different products produced by different industries thus making the productivity changes impossible to measure.

3.2 Customization and new products

Related to the above, the digital economy is increasingly facilitating the customization of products (goods and services), again making it difficult to measure price change while controlling for quality differences. This issue is made more challenging by the extent of the options and number of different pricing models offered. In addition, the number of new products and services coming to market, particularly software and technology, make it increasingly difficult to track the same products/services over time. This 'new product' bias is further exacerbated by digitalization, requiring more frequent linking between new and discontinued products, as well as new approaches to quality adjustment.

3.3 Pricing and measurement

Here, the issue is that payment for digital services/products cannot always be measured in units or volume. This is not so much an issue for GDP estimates, but it may matter in terms of quality adjustment, such that the price per unit cannot be measured. For example, the price of a Netflix account will be the same for all consumers, regardless of how many hours they want to watch. In terms of price indexes, the impact is that standard procedures used for quality adjustment cannot be used. The argument can be made that this is no different than buying a brick of cheese in-store and only consuming half of it. But, if the brick of cheese becomes larger or is sold in packs of two, its price per unit would likely decrease. In the case of digital services, the price paid is really for access to the service, such that an increasing quantity of the good or

service would not register a corresponding drop in prices as might normally be the case for in-store products.

Other challenges with respect to prices have also been observed, including frequent changes to internet pricing, based on consumer preferences and browsing history, time of day, day of week, and even the platform used to make the e-commerce purchase.

As a result of the challenges described here, the producer prices division at Statistics Canada is increasingly relying on alternative and administrative data sources, to acquire more robust price observations for more products and services. These data sources have been critical to the development of price indexes for a few financial services, as well as services with more online prevalence (i.e. traveler accommodations, where prices are collected directly from hotel websites, and commercial software and computer peripherals, where prices are obtained from a third-party data source). Web scraping is another method that can be used to start collecting online prices in service industries where they are currently excluded from the calculation of the price index (i.e. retail services).

4. Impact on the CSMA

The digital economy is also creating different challenges for the Canadian System of Macroeconomic Accounts (CSMA). Work is underway to find solutions, in terms of identifying what is currently being captured, and what may be missing or measured incorrectly. In addition, it is now clear that even if the CSMA is capturing the appropriate activity from the digital economy, the issue of appropriately deflating the output from this activity remains. The Macroeconomic Analysis (MEA) Branch at Statistics Canada is working on a separate paper that will explore in more detail the challenges with capturing the digital economy in the CSMA. Some of the main challenges are highlighted here:

4.1 Classification of digital transactions

As digital transactions become increasingly complex, and the lines between goods and services produced and consumed by the various sectors of the economy are blurred, it makes it difficult to classify the transactions into the existing framework of the CSMA. In addition, bundling of digital and non-digital products (e.g. Amazon Prime offers free shipping as well as online storage and video streaming services), and the availability of multiple methods of payment for digital products bring into question whether these activities are being captured correctly. Some digital transactions are likely already accounted for, however without a consistent way to identify them, there is a risk of either missing them completely or double counting.

4.2 Borderless transactions

E-commerce and digital delivery (i.e. downloads, streaming) make it easy for households and businesses to buy and sell to and from just about anywhere in the world. Households are buying more and more directly from producers, which means that the CSMA may not be capturing the transactions, particularly if they are with non-resident sellers. Trade of goods is included in the customs data as 'low value shipments', but these cannot be properly identified and allocated to

specific expenditures. Similarly, trade of services only captures the activity of Canadian businesses with non-residents. As such, when Canadian households buy digital services from a non-resident business (e.g. Netflix), this transaction is not captured in the CSMA. Although some estimates and allocations are made to account for this activity in international trade, complete data do not currently exist. The digital economy, and e-commerce in particular, make accounting for cross border transactions much more difficult.

Additionally, even if digitally delivered goods and services are captured in the CSMA, they may not be accurately deflated final expenditures reflecting global consumption and prices. As an example, if the CPIs and PPIs only include domestic prices and weights, then these would not be the appropriate deflators for consumer expenditures, which in turn may underestimate volume estimates.

4.3 Proliferation of digital platforms

As previously mentioned, digital platforms are facilitating new ways of doing business for both the business and household sectors. There are three main challenges related to digital platforms: firstly, these platforms facilitate exchanges between two independent units, often households, which are not surveyed for productive activity; secondly, the platforms themselves are most often non-resident units, which are not measured by any Statistics Canada surveys; finally, while platforms do charge a fee for their intermediary services, this fee is often embedded in the expenditures that the CSMA may have already captured. In this case, there is no easy way to know how much of the total expenditures by households and/or businesses has already been captured, in order to distinguish the proportion that should be allocated to the platform.

4.4 Households increasingly producers of output

Households are using technology and the availability of digital platforms to leverage their knowledge, skills and assets by providing goods and services to the market. Essentially, the digital economy has taken the traditional activity of household production to a whole new level. Since there is no household production account in the CSMA, the value of these activities has relied on income reported through tax data. With the expanding nature, scope and volume of household production, there is likely a growing measurement gap with respect to the output and value added of the household sector – this is an issue because some households do not report the activity through tax, and tax data does not provide any information on the inputs or products produced by the household.

As noted earlier, some experimentation has been done using the Labour Force Survey (2016, see questions below) to collect information on household sharing economy (peer-to-peer) activities.

Definitions

Peer-to-peer ride services, such as Uber or Lyft: Services that connect riders and drivers through a mobile application that acts as an intermediary and processes the payment from the rider to the driver.

Private accommodation services, such as Airbnb or Flipkey: Services that connect travellers and hosts through a mobile application or website that acts as an intermediary and processes the payment from the traveller to the host.

A **census metropolitan area (CMA)** consists of one or more neighbouring municipalities situated around a population centre (known as the core). A CMA must have a total population of at least 100,000, of which 50,000 or more live in the urban core.

Data for this study were derived from seven questions added to the October 2016 Labour Force Survey (LFS). Respondents aged 18 and older living in the provinces were eligible for the questions.

The analysis focused on the eight most populated census metropolitan areas (CMAs) in Canada: Toronto, Montréal, Vancouver, Calgary, Edmonton, Ottawa–Gatineau, Québec and Winnipeg.

Variations across provinces and CMAs in the use and provision of peer-to-peer ride services and private accommodation services may reflect differences in legislation and regulation of services across Canada. In addition, estimates of the number of users and providers are calculated based on the place of residence, which may differ from the location in which the service was used.

The questions asked were:

1. In the past 12 months, did you use ride services such as Uber, Lyft, etc.?
2. In the past 12 months, what was the total amount that you personally spent on these ride services in Canada?
3. In the past 12 months, did you use private accommodation services such as Airbnb, Flipkey, etc.?
4. In the past 12 months, what was the total amount that you personally spent on these private accommodation services in Canada?
5. In the past 12 months, what was the total amount that you personally spent on these private accommodation services outside of Canada?
6. In the past 12 months, did you offer ride services such as Uber, Lyft, etc.?
7. In the past 12 months, did you offer private accommodation services such as Airbnb, Flipkey, etc.?

The response rate for these questions was 88%. The LFS has a sample of approximately 100,000 individuals.

5. Moving forward

Properly measuring both e-commerce and the production and consumption of digital products and services presents many different challenges that must be overcome to build indicators that are representative and relevant.

As more service industries adopt the use of technology, more digital products emerge, creating gaps in definitions and data. Therefore, moving forward, one of the greatest challenges for statistical agencies in collecting accurate and relevant data on the digital economy is the rate at which things are evolving. Seeing as Statistics Canada conducts culture surveys every two years, and demand-side surveys of household and business e-commerce have been conducted on an ad-hoc basis, it can be difficult to maintain consistent definitions and time series, as the technology seems to be evolving faster than the questionnaires used to capture the information.

Ongoing surveys measuring both the supply- and demand-side of this phenomenon will play an important role in understanding the scope and scale of e-commerce and the impact of the digital economy. In fact, new demand-side information from households and businesses will be collected for reference year 2018 through the Canadian Internet Use Survey (CIUS) and the Survey of Digital Technology and Internet Use (SDTIU). At the same time, research by the MEA Branch is ongoing to outline more clearly the measurement challenges surrounding digital transactions in the CSMA.

Through ongoing consultation with respondents, industry, other statistical and international organizations, as well as the exploration of alternative data sources, we are gaining a better understanding of the impacts, challenges and solutions to be in a position to better measure and account for e-commerce activity in the statistical system.

Issues	Retail and service industries	Digital culture products	SPPIs	CSMA
Concepts	If there is an Internet based commitment to purchase on behalf of both the consuming and producing entities, then the resulting transaction is counted as an e-commerce sale.	<p>Must distinguish digital products such as e-books, from digital transactions (e-commerce).</p> <p>There is no standard way of accounting for the number of digital products sold (i.e. via streaming, downloading, etc.)</p> <p>Questionnaire testing has been completed.</p>	Price vs. Volume	
Classification	Blurred distinction between e-commerce activity from non-store and store retailers may necessitate a change to the industry classification	Updated to the 2017 versions of the classification systems to classify businesses according to their main business activity rather than their product format and to classify products according to their purpose rather than their format.		Challenges classification of digital products on platforms
Collection		<p>Small businesses tend not to separate the digital versus physical components in their accounting processes.</p> <p>Streaming is not subject to the same type of regulation as traditional broadcasting.</p>	<p>Experts advocate more frequent collection of prices for goods and services in the digital economy (i.e. weekly, daily).</p> <p>Exploration and use of new data sources, web scraping, big data could make more frequent price collection more feasible for statistical agencies</p> <p>Product customization</p> <p>New goods problem</p> <p>Quality adjustment</p>	<p>No digital products which cover information products</p> <p>No common units</p> <p>Exploration to observe transactions</p>
Coverage	Online retailers must have domestic Canadian retail operations to be considered as Canadian retail. Online sales by Canadian retailers to foreign			Proliferation of platforms Increased output

Issues	Retail and service industries	Digital culture products	SPPIs	CSMA
	<p>consumers are included, but online purchases by Canadian consumers from foreign-based retailers are excluded.</p> <p>Canadian retail businesses have different methods for allocating their e-commerce sales to stores. Statistical agencies must consider how to standardize the method for reporting sub-national on-line sales and then implement the standard in the collection vehicle.</p> <p>E-commerce section was added to 22 surveys in the service industries to capture online spending in areas such as Travel arrangement and Traveller accommodation etc.</p>			
Impacts			Potential bias in price indexes on measured GDP and productivity	Possibil - - - -

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