

DISSECTING THE RETAIL SECTOR IN COLOMBIA: TRADITIONAL AND ONLINE PLAYERS

Martha Elena Delgado and Juan Benavides
with the collaboration of
Cristina Fernández and Alejandro Becerra

Fedesarrollo

Calle 78 # 9 - 91, Bogotá, Colombia.

Teléfono: (601) 3259777

  @Fedesarrollo

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A study by Fedesarrollo

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Introduction

The growth of online retail stimulates market efficiency by reducing the cost of purchase and the time of search and acquisition for products. The pandemic, albeit temporarily, gave online sales a major boost around world, especially in developing countries. In Latin America, online sales experienced a growth of approximately 36.7% in 2020. Moreover, international retailers increased their presence in the region, with online marketplaces and platforms launching new marketing strategies to attract more consumers.

As of December of 2021, in Colombia, online retail sales represented approximately 3.4% of total retail sales. Online sales can occur in many channels including a business website, a social media platform, and an online marketplace to name a few. These various channels compete amongst and within one another. For example, online marketplaces compete (i) among other online sales channels such as online marketplaces, business websites, social media platforms allowing transactions (this is commonly referred to as multihoming whereby consumers use various channels when shopping online), (ii) with brick and mortar stores facilitating cash payments (includes little local markets - tiendas de barrio) and (iii) with traditional retailers that operate both online sales and physical stores (such as Falabella, Homecenter, Carulla, Éxito, Alkosto, Makro and D1 to name a few).

Competition and concentration are not a current regulatory concern in retail for policymakers. Barriers to further online growth in Colombia include low internet connectivity and interest in digital purchases, low or limited digital literacy and technological education, financial inclusion, poor logistics infrastructure, and an incomplete regulatory framework (OECD, 2020). Although there is clear progress in digitalization and retail is one of the most benefited sectors, firms' efforts are not enough to carry out the whole transition; and that is where the public sector adaptation must play a leading role.

This document is composed of three chapters, in addition to this Introduction Chapter 1 presents a review of the evolution of online retail sales in Latin American and Caribbean countries. Chapter 2 gives an empirical assessment of the supply and demand side of retail in Colombia. Finally, Chapter 3 summarizes key findings.

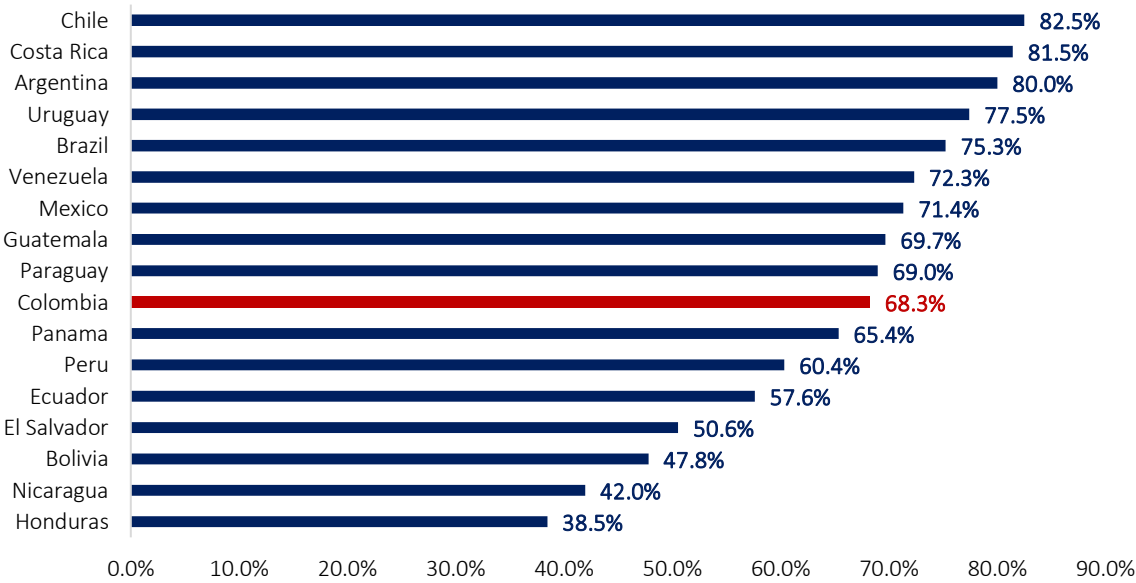
A primer on the microeconomics of retail and e-commerce can be found in the Appendix, which serves the dual purpose of informing a wide audience of the benefits of online sales channels generating competition and warning against heavy-handed regulation that would harm such competition, innovation, and consumer welfare.

Chapter 1. Online retail in Latin America and the Caribbean

1.1. Internet adoption: key to increasing consumer value

Internet usage worldwide grew dramatically during the last decade, with 2.5 times more internet users in 2020 than in 2010, equivalent to an increase of 2.8 billion new users (Statista, 2021). The regions with the highest average growth of internet users over the last 5 years have been Africa (12.6%), Asia (10.1%), the Middle East (9,9%) and Latin America and the Caribbean (7.1%). The latter currently holds 467 million internet users, a 72% penetration rate. However, internet penetration in Latin America is characterized by a high degree of heterogeneity among countries, ranging from 38.5% to 82.5% (Figure 1).

Figure 1. Internet penetration rate, January 2021
(% of total population that are internet users)



Source: Statista, World Bank. Author’s calculations.

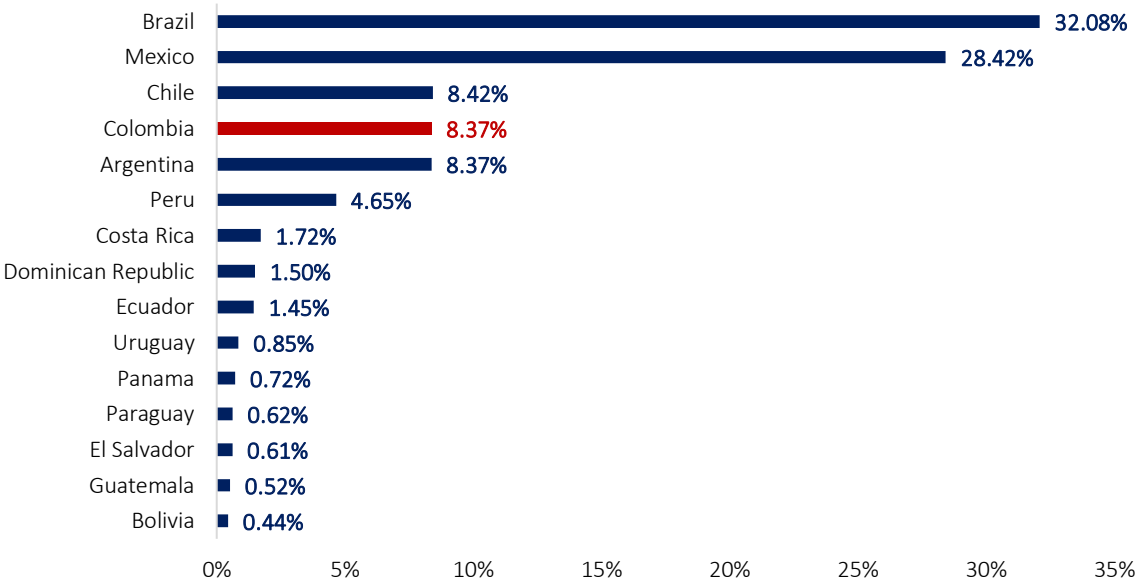
Colombia stands in the middle of the table, with 34.8 million internet users (4.0% increase from the previous year) and a penetration rate of 68.3%. Compared to the main Latin-American economies, such as Chile, Argentina, Brazil and Mexico, there is a significant gap of up to 14.3 percentage points. Even so, the amount of time spent on the Internet in Colombia -9 hours and 10 minutes daily- is one of the highest compared to OECD countries and emerging economies, only surpassed by Philippines, South Africa and Brazil, while the worldwide average stands at 6 hours 43 minutes (Datareportal, 2020). Regarding social

media, there were 39 million social media users in January 2021, which translates into 76.4% of total population, and the average time spent using social media is 3 hours and 45 minutes.

1.2. Evolution of online sales in Latin America and the Caribbean

Online sales have grown rapidly after COVID 19, as there is a wide variety of webpages to buy from, more reliable and faster online payment methods, a higher use of social media for commerce, as well as an overall change in consumption behaviors. By 2020, online sales worldwide amounted to \$4.28 trillion USD (eMarketer, 2021), \$2.9 trillion USD more than in 2014. In addition, it is expected that online sales will grow annually by \$530 billion USD on average for the following years, reaching \$6.4 trillion USD in 2024. In Latin America and the Caribbean, online sales are the highest in: Brazil, Mexico, Chile, Colombia, and Argentina, representing 85.7% of the region’s online sales annual gross revenue (Figure 2).

Figure 2. Distribution of online sales in Latin America and the Caribbean, 2020 (% of total revenue in Latin America)



Source: Statista (2020).

Brazil and Mexico make up most online sales for the region with 60.5% combined. Colombia’s online represents 8.4% of the online sales in Latin America, like Chile and Argentina, and well above the rest of the countries.

Frequency of online purchases per customer and new digital buyers also increased since the beginning of the pandemic, as households faced lockdowns. For example, between February

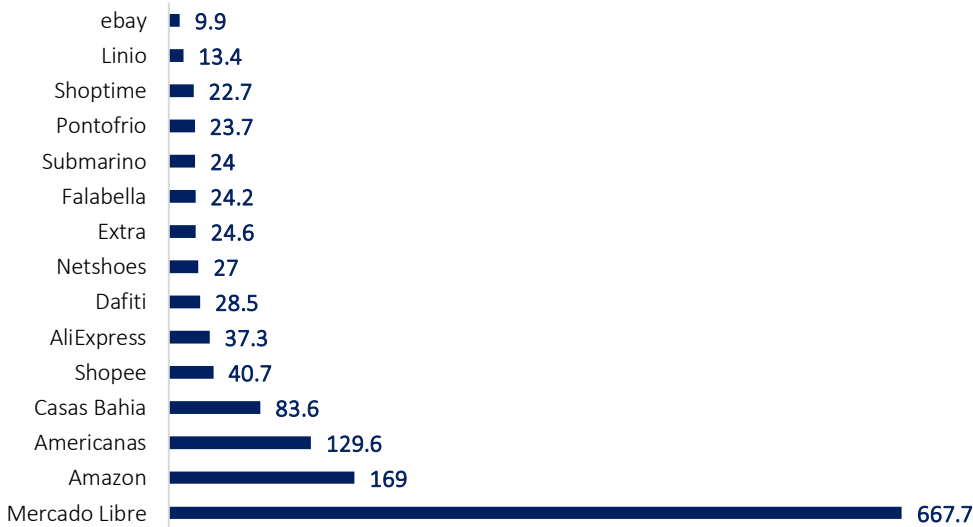
24, 2020, and May 3, 2020, orders through Mercado Libre increased by 119% in Colombia, in comparison to the same period in 2019. Also, during this time, there were 366,000 new buyers in this marketplace, equivalent to a 113% growth. All types of buyers –loyal, frequent, and occasional– increased their buying frequency.

1.3. Top online marketplaces

Mercado Libre (Argentine company founded in 1999 that has swiftly expanded to Brazil, Colombia, Ecuador, México and Perú) ranks as the most visited marketplace in the region as of April 2021, with more than six hundred million visits per month. This is approximately four times higher than the next marketplace in the ranking. In second place comes Amazon with around one hundred sixty visits per month, followed closely by Americanas.

As showed in the Figure 3, even though the availability of e-commerce websites has grown, Mercado Libre has a strong leading position in the region. This is consistent with the fact that it was the platform with higher net revenue increase in 2020 – approximately 73% – and its number of unique active users reached 132.5 million. Most of those revenues come from the Brazilian market, followed by an increasing participation in the Mexican and Argentinian market (Statista 2021).

Figure 3. Top online marketplaces in Latin America (Millions of monthly visits as of April)



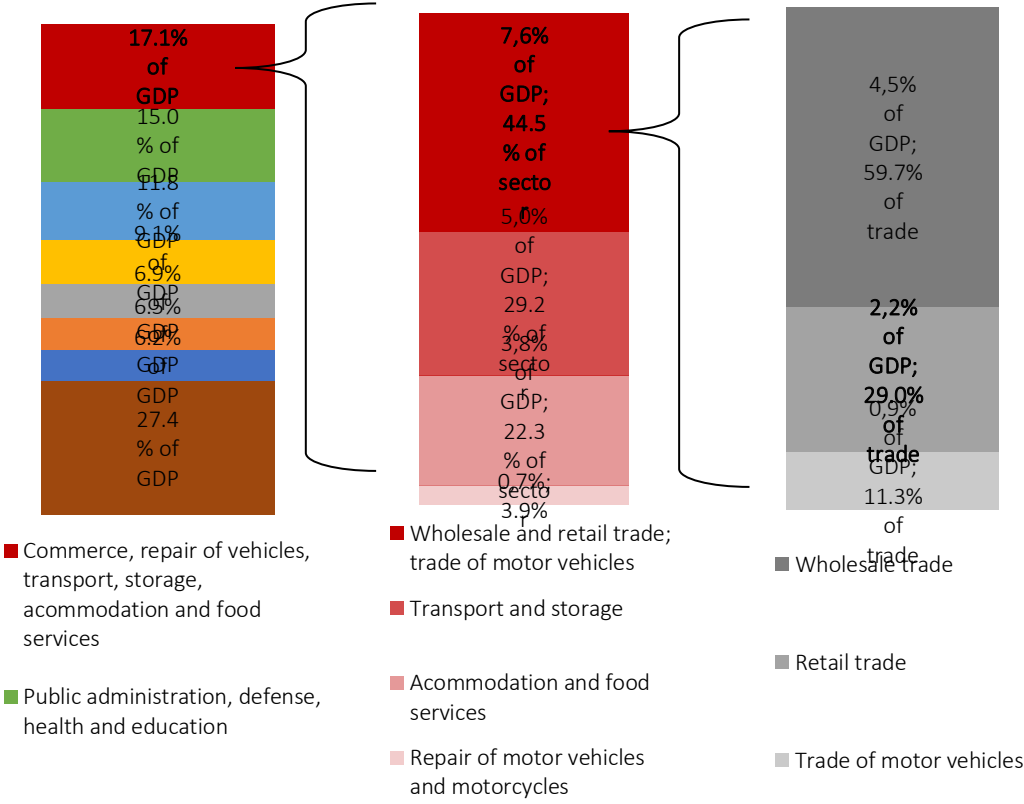
Source: Statista (2021).

Chapter 2. The retail industry in Colombia

2.1. The supply side: out-performing GDP growth

To characterize the online sales market in Colombia, it is important to consider a broader scope of the sales landscape in the national accounts. Online sales are included in the total retail trade sector, which represented 4.5% of the GDP in 2019, reaching almost 500 billion pesos. Figure 4 shows the relative size of retail in Colombia and its location in the accountability of the added value in the country.

Figure 4. Decomposition of real GDP, 2019



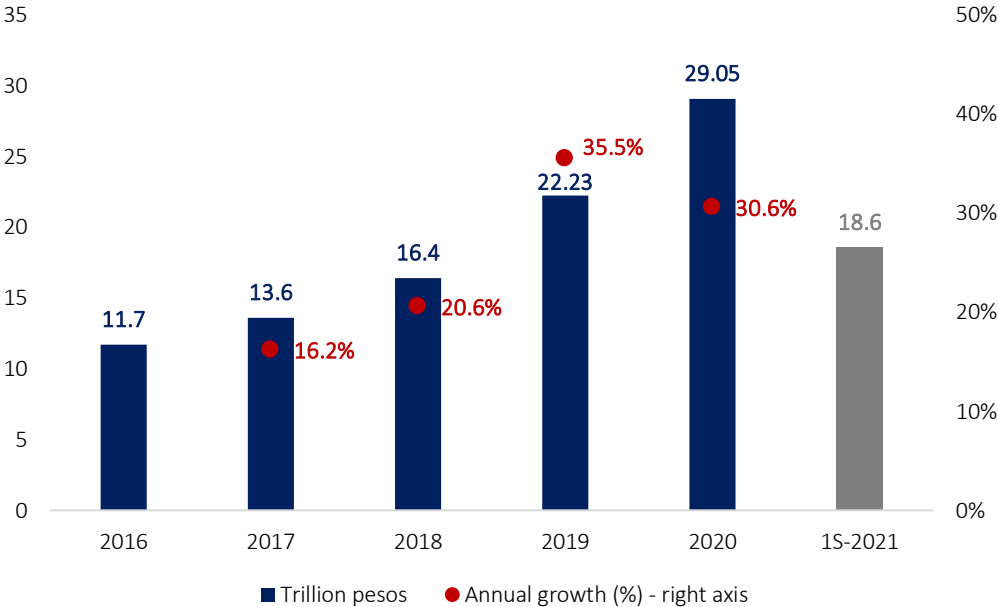
Source: DANE. Authors' calculations.

The rate of growth of retail is generally higher than the entire Colombian economy (Figure 3). Retail has grown at rates above 10%, as in 2014 (22.3%) and 2016 (14.3%). Although the Colombian economy slowed down in 2017 and 2018, retail growth expanded at similar rates, maintaining its expansionary path, and showing resilience in the valley of an economic downturn. More importantly, while the economy contracted at a rate of 6.8% in 2020, retail contracted by only 1.6%. This was a result of the COVID-19 crisis in 2020, which increased the demand for basic goods as people stayed home.

Retail has witnessed tremendous innovation with the growth of online sales and the evolving omnichannel experience, which enhances the shopping journey by enabling consumers to conduct product research, price comparisons and complete transactions using online channels, offline channels, or a mix of both. For example, a consumer can start their shopping journey obtaining inspiration as they scroll through an app, compare the product’s price on a retailer’s website and an online marketplace but ultimately decides to drive to the store to purchase the product to take it home the same day. This is commonly referred to as an omnichannel experience whereby the consumer uses both offline and online channels throughout their shopping journey depending on their needs.

Measuring online sales in Colombia is challenging because national accounting release aggregate information for the retail industry. However, we present an approximation based on the Monthly Commerce Survey presented in Figure 2. According to our calculations, online retail sales represented approximately 3.4% of total retail sales by the end of 2021. Based on data from the Colombian Chamber of Electronic Commerce (CCCE, from its Spanish initials), the online sales in Colombia showed a significant upward trend over the last 5 years, with two-digit annual growth rates of 19.9% Compound Annual Growth Rate (CAGR) (Figure 5).

Figure 5. Online sales (Trillion pesos and annual growth)



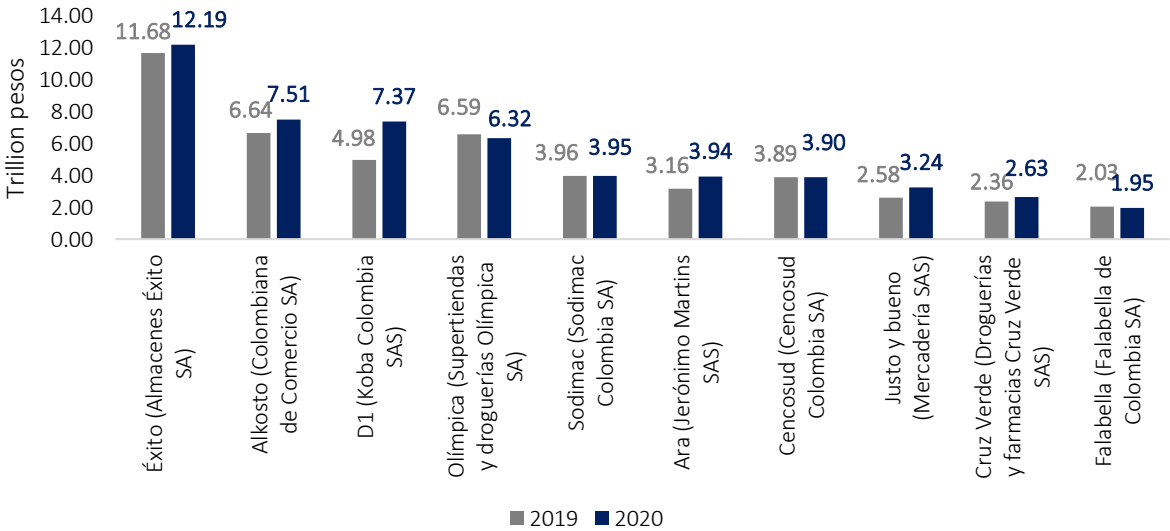
Source: CCCE (2021). Author’s calculations.

Before the COVID-19 pandemic, there were 22.2 trillion pesos (2,1% of the GDP or 6.8 billion dollars) in online sales and 119 million online transactions in 2019, which represents an increase of 35.5% and 52.9%, respectively, from 2018. Even though the COVID-19 pandemic negatively affected households’ income, many consumers migrated to digital channels to buy goods and services due to lockdowns and social distancing. Consequently, online sales peaked at 29.1 trillion pesos in 2020 (2.9% of the GDP or \$7.9 billion US dollars), representing a 30.6% annual increase. Overall, COVID-19 boosted this growing industry by accelerating adoption of online channels that are likely to have lasting impact (UNCTAD, 2021). The increase of online sales, online purchase frequency, new users and changes in payment methods demonstrates that the sector is experiencing a structural change sooner than anticipated.

During the first semester of 2021, sales and the number of transactions grew 50.4% and 74.9%, respectively, compared to the first semester of 2020. Sales from the first semester of 2021--worth 18.6 trillion pesos or 5.1 billion dollars--represented 64% of the sales registered in both semesters of 2020. Euromonitor (2021) estimates a 9.5% growth for the present year and a 13.7% CAGR between 2020 and 2025, while CCCE (2021a) expects a 16% growth for 2021 relative to the previous year.

The largest retail companies in Colombia are non-specialized retail stores, especially those dedicated to the distribution of food and basic goods for the home. (Figure 6).

Figure 6. Operational revenues of top 10 retail companies in Colombia

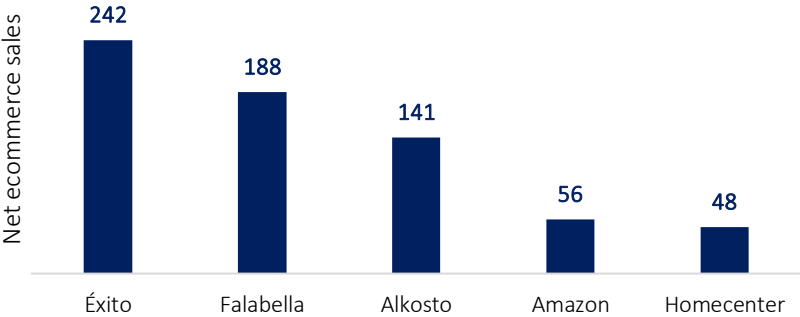


Source: Supersociedades. Authors’ calculations.

Measured by operational income in 2020, the largest player in the retail market in Colombia is Exito, which reached revenues of 12 trillion pesos. Alkosto with revenues of 7.4 trillion pesos and D1 Stores with a revenue of 7.4 trillion pesos are tied for second and third, and Olimpica with revenue of 6.3 trillion pesos comes in fourth. Sodimac, Ara, Cencosud, Cruz Verde and Falabella are, in their order, the other retailers with the greatest relevance and whose operations generate revenue between 2 and 4 trillion pesos.

In terms of 2020 sales, the Exito store registered the highest sales volume through its website, reaching more than 200 million dollars at the end of the year. In second and third place are the Falabella and Alkosto online stores, achieving more than 100 hundred million dollars in net e-commerce sales during 2020. At the end of the top-five, Amazon and Homecenter reported sales around 50 million (Figure 7). It should also be noted that Amazon was the only store of the ranking without physical headquarters for purchases.

Figure 7. Top online stores in Colombia 2020 (Million US dollars)



Source: EcommerceDB (2021).

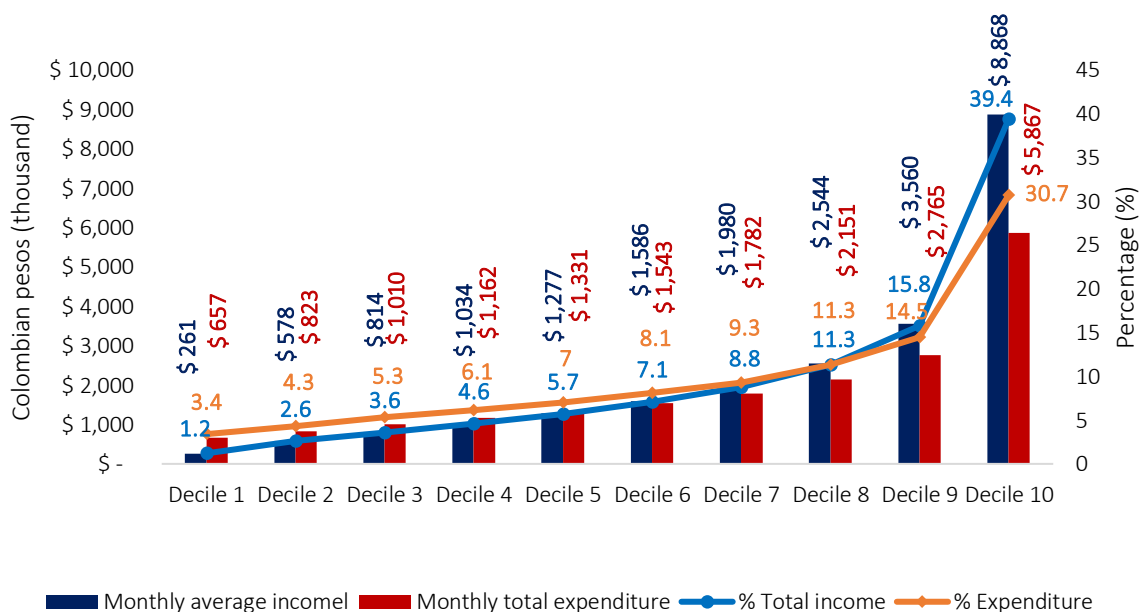
Brick-and mortar-firms in Colombia can sell their products online not only directly through their platform, but using a third-party online shop, such as Rappi, one of the most important delivery apps in Colombia and Latin America. Rappi reached 3 million active users in 2022, covering 51 cities in Colombia and nine countries in the region.

In balance, there are four important issues to highlight in the supply side: (i) economic growth in recent years has leveraged the expansion of retail trade and the greater penetration of retail in Colombian aggregate production; (ii) the dynamism of the retail industry, especially since 2016, has allowed the size of this market to exceed 2% of GDP; (iii) there is a non-negligible growth potential if one considers that it was one of the most resilient sectors during the COVID 19 pandemic, and iv) current and future growth in retail will be, in part, due to the adoption and integration of online sales channels in addition to the physical options.

2.2. The demand side of retail: consumers preference for specialized goods, cash transactions and low access to financial services

The purchasing power of individuals is the gross disposable income of households, estimated in the latest National Household Budget Survey published by DANE in 2017 and carried out every ten years. This variable is relevant to the characterization of Colombian consumers, since allows us to specify their purchasing power. The average disposable income of a household in Colombia in 2017 was 2.3 million pesos, with wide disparities (Figure 8).

Figure 8. Total income and expenditure per income decile in Colombia, 2016-2017



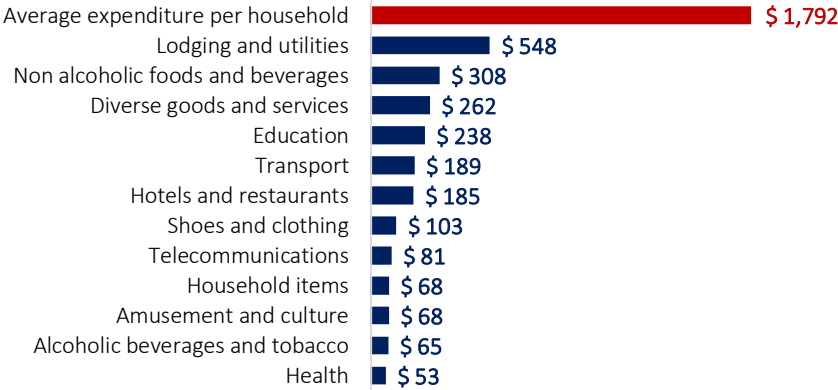
Source: DANE. Authors' calculations.

While the richest decile has an average income of 9 million per month and accumulates 39.4% of the total disposable income of the country, the poorest decile only receives 261 thousand pesos per month and accumulates 1.2% of total income. These disparities remain in the expenditure category, where decile 10 spends 5.9 million of its disposable income, whereas the first decile spends more than it receives and reaches 657 thousand pesos. This characteristic is maintained throughout the first five deciles, which shows that a good part of household consumption in the country is leveraged through credit, which can be formal or informal.

Figure 9 shows that on average households spend 1.8 million pesos per month, most of which is destined to the payment of rents, public services, and food. After this, the retail trade has a more prominent representation, where the average expenditure on diverse goods and

services reaches 262 thousand pesos. Telecommunication goods and home furnishings have a lower participation.

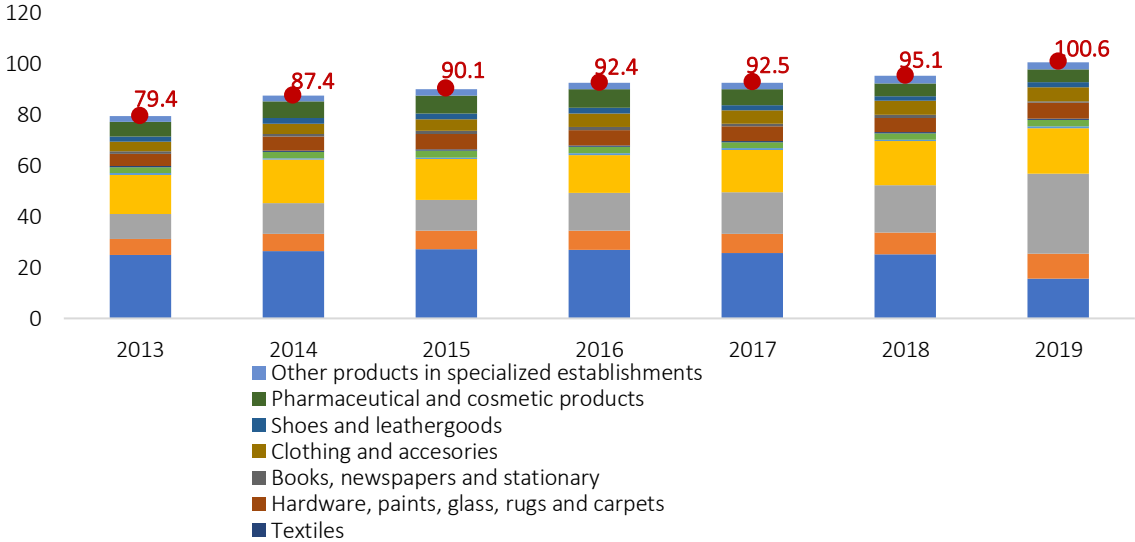
Figure 9. Monthly expenditure per household in Colombia. 2016 – 2017



Source: DANE. Authors’ calculations.

The increase in household purchasing power described above has translated into higher retail sales over the past decade. These sales have increased by about 20 trillion pesos, going from 79.3 trillion in 2010 to 100.6 trillion in 2019. Most of the spending is made in non-specialized stores, food distribution stores, gasoline, and vehicle parts as well as specialized food establishments, which as of 2019 increased its participation (Figure 10).

Figure 10. Retail by type of commerce –total sales (Trillion pesos)

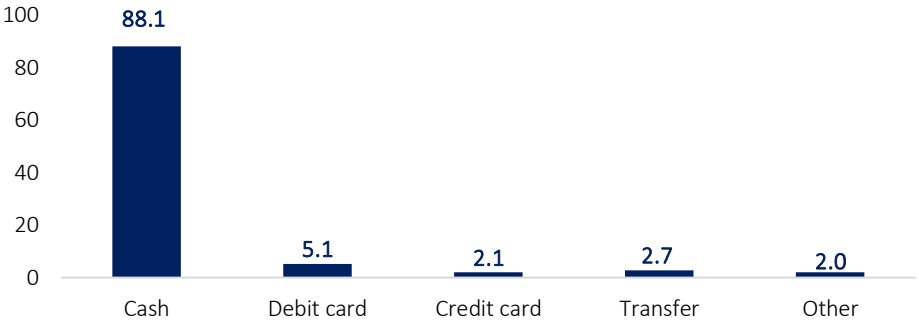


Source: DANE. Authors’ calculations.

Among all retail verticals, trade of goods shows a significantly lower share when compared to trade of services. The most traded goods are those purchased at non-specialized non-food establishments such as computers and telecommunications accessories, pharmaceuticals, and cosmetic products, among others. However, when we take out of consideration services related to food in specialized establishments, the share of traded goods increases well above 70% in 2018 and 60% in 2019, showing that most of the retail expenditure is destined to different types of goods and in terms of services is mostly dedicated to restaurants. It is expected that participation will increase in the 2020 y 2021 statistics, since services supply was limited due to the mobility restrictions adopted in the country to stop the spread of COVID-19.

Regarding payment methods patterns, Colombian consumers exhibit a strong preference for cash. According to the Survey of Means of Payments 2020 published by Banco de la República, 88% of Colombians have cash as their preferred payment instrument, followed by only 5.1% of the population who prefer debit card. Since brick-and-mortar firms have presence at the national level, they enable direct purchases in their stores with cash. This represents an important challenge for the growth of sales through online channels since it constitutes a channel where payments through credit cards or at least one online banking channel is usually necessary to complete transactions (Figure 8).

Figure 11. Preferred payment instrument

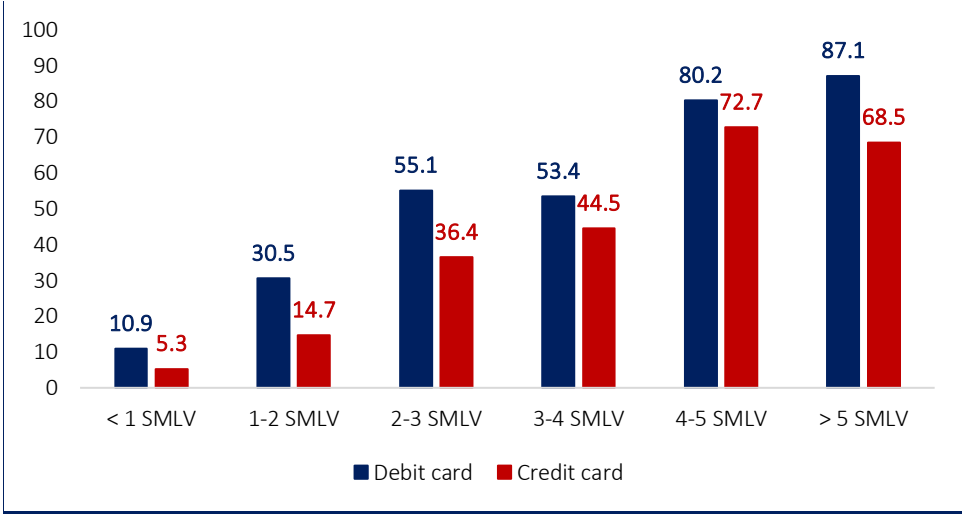


Source: Survey of means of payments. Banco de la República, 2020.

According to the data reported in the survey, the preference for cash in Colombia is due to two main factors: on the one hand, banking in the country is still limited and 30% of households state that they do not have a savings account or a credit card. On the other hand, high levels of informality in labor and business makes payment with cash easier, faster and constitutes a habit for costumers.

Access to banking products is related to the income decile of households. Access to a savings account or credit card in the first decile only reaches 11% and 5% respectively (Figure 12), while for the richest decile these numbers increase to 87% and 68.5% respectively.

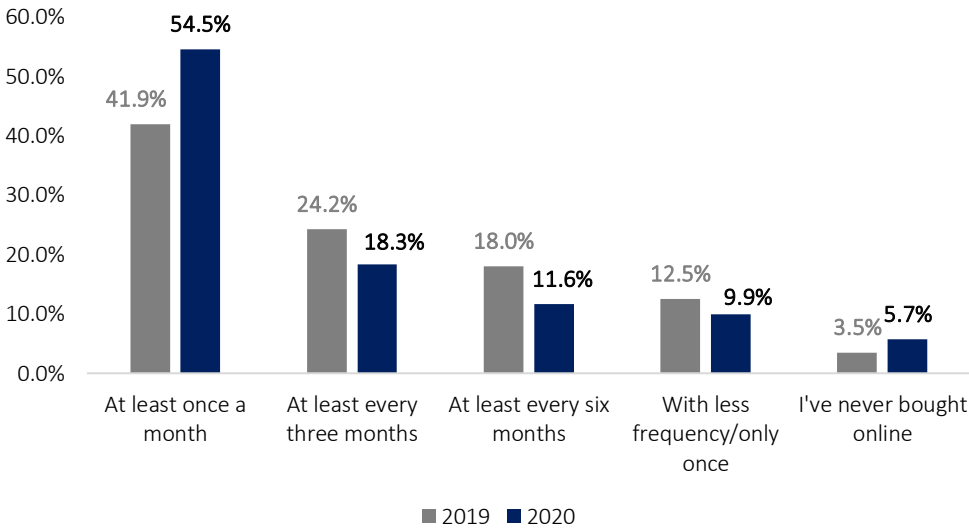
Figure 12. Access to financial services per decile in Colombia



Source: Banco de la República. SMLV: current legal minimum salary.

According to Minsait Payments (2021), in 2019, 41.9% of survey respondents bought a good or service online at least once a month, 24.2% at least every three months and 18.0% at least every six months (Figure 13).

Figure 13. Purchase frequency of goods or services through Internet



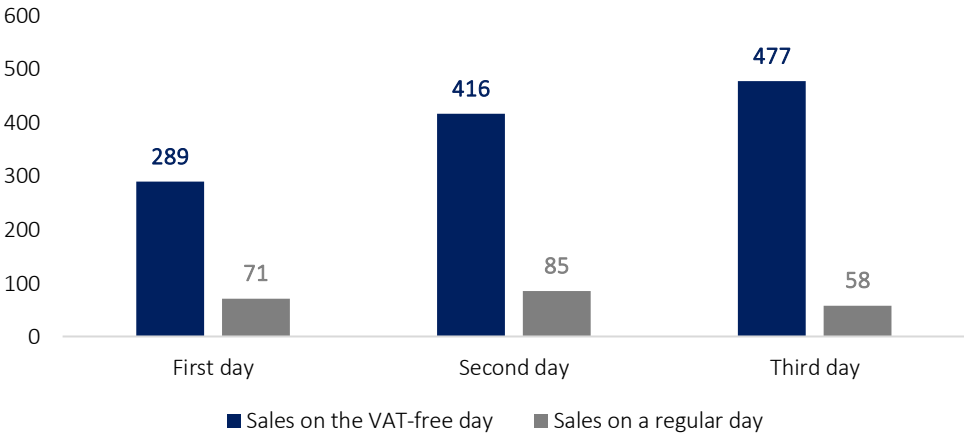
Source: Minsait Payments (2021).

With the uptake of digital channels, the percentage of people that declared buying at least once a month increased 12.6% up to 54.5%. Accordingly, the rest of the options with a lower buying frequency diminished, specially purchases at least every six months (6.4 percentage points difference). Moreover, the use of smartphones for Internet purchases has also increased between 2019 and 2020 by 7.1%, where 76.4% of respondents answered that they usually buy using this device, while computers (59.1%) and tablets (3.4%) have experienced a decrease in their use relative to 2019.

A factor that boosted online purchase in Colombia during the COVID-19 pandemic has been the “*Días sin IVA*” or VAT-free days, a government initiative to boost the economy, that initially took place in 2020 (June 19, July 3, and November 21). It consists of tax-free purchases of items such as clothing, household appliances, electronic devices, sports items, among others. The payment methods accepted were credit or debit cards, electronic transfers, or other online payments, except cash. This encouraged even more online shopping: in just the first day of the VAT-free day, traditional internet traffic got multiplied by a factor of 18 and electronic sales grew between 5 to 8 times relative to a normal day in 2019, according to the Minister of Commerce, Industry and Tourism (El Tiempo, 2020).

Relative to sales in a normal day, sales in the first VAT-free day increased by 309%, in the second day by 389% and in the third day by 725% (CCCE, 2021a). The difference in sales ranged from 217 billion pesos up to 419 billion pesos (between 59 and 113 million dollars). Other activation of e-commerce events, such as *Cyberlunes*, *Hot Sale* and *Black Friday*, had positive impacts on the industry during 2020, with revenues amounting to 275 billion pesos, 302 billion pesos and 467 billion pesos, respectively (Figure 14).

Figure 14. Online sales on VAT-free days (Billion pesos)



Source: CCCE (2021).

This consumer response to promotions is explained by the fact that 70% of the surveyed Colombians reported regularly buying on-sale, in addition to 85% of consumers willing to trade brands based on promotion (BCG, 2021). Despite consumers' use of digital channels at the beginning of their shopping journey, most often it doesn't translate into completing a purchase online, as consumers still show preference for "physical channels" as discussed in the previous section. Buyers in Spanish-speaking South American countries use the Internet more to research and get information about the products they are interested in, and less to complete a purchase online. According to a survey in the region by conducted BCG (2021), 82% of respondents use online channels to read user reviews for a product, 81% for promotions, 80% for product features and 73% for price comparisons.

Several factors play a role in consumers wanting to continue purchasing products from a physical store vs online including the ability to test a product (30%), price (19%), a lower sense of security when making online purchases (19%), long delivery periods (15%), and shipping price (13%). Thus, 68% of consumers prefer to make purchases in-person, while 32% prefer online purchases. By category, in-person purchase preference is higher in self-care and clothing (80%), followed by food (79%), and home, services, and TMT (68%), whereas online purchase preference is more prevalent in travel and commute (55%).

In Colombia, there is an important gap in terms of internet usage, especially in rural areas of the country; thus, many people have no access to online retail channels or do not know how to use them. As it was shown previously, the internet penetration rate is around 68.3%, not at the end, neither at the head of Latin America's ranking. According to the information published by the National Administrative Department of Statistics (DANE), in 2020 the Colombian departments with less share of households connected to internet services were: Vaupés (3.1%), Vichada (7%), Chocó (13.2%), Amazonas (15.6%) and Guainía (18.9%). In addition, the share of households with computer or tablet was 39.3% at national level, and 10.4% in rural areas (Bloomberg, 2021). In this context, one of the main tasks is to increase internet connectivity across the country. This would be a first step to move towards education that allows people to access digital channels.

The banking gap presents another obstacle with many households being underbanked and unbanked. Access to financial services such as bank accounts or credit cards are crucial for e-commerce growth, as most of the online sales demand digital payments. According to the 2020 report from the Superintendence of Finance (SFC 2021), in Colombia the percentage of adults with an active financial product was 72.6% (66% in 2019). However, it drops to 54.9% when considering only the rural areas; and in the Pacific region, it falls to 64.3%. Nevertheless, the country has witnessed a notable improvement, also boosted by the new

financial mobile applications that do not require documentation or previous bank procedures.

Overall, the demand for retail in Colombia can be characterized as (i) having a marked positive trend during the last decade along with household's income improvement, (ii) having an income and expenditure capacity highly concentrated in the last deciles of income, and (iii) having a focus on goods, although the importance of services demand is increasing. However, it is key to consider the re-composition of households' spending priorities, where rents and meals outside the home have taken on greater relevance as the country's income has risen, occupations are more sophisticated and involve working long hours outside home, according to the latest national census carried out by the DANE.

Chapter 3. Key findings of the study

Colombia is still in its infancy stages as it relates to the adoption of online sales channels. The country has a low penetration in digitalized payment services, internet connectivity and banking, and cargo logistics. Moreover, many consumers prefer cash transactions and distrust web transactions. There are no high entry costs in retail, whether online or offline, switching costs among retail channels for consumers are low, and there is no concentration in the retail supply side. The government should carry out public policies focused on improving connectivity and digital inclusion across the population “to ensure that e-commerce delivers for everyone” (OECD 2021).

The key findings of this study are:

- In Colombia, the trade sector (both wholesale and retail) exhibits a higher growth rate than the economy. Online retail sales showed a significant upward trend over the last 5 years, with two-digit annual growth rates of 19.9% CAGR.
- Many consumers migrated to digital channels to buy goods and services during the COVID-19 pandemic. Online sales peaked at 29.1 trillion pesos in 2020 (2.9% of the GDP or 7.9 billion dollars), representing a 30.6% annual increase.
- The average disposable income of a household in Colombia is 2.3 million pesos, with high disparities. Most of the household spending is made in non-specialized stores, food distribution stores, gasoline, and spare parts for vehicles, as well as specialized food establishments.
- Consumers may start their shopping journey researching a product online, however, often it doesn't translate into completing a purchase online. Consumers continue to prefer purchasing in physical channels, according to 2020 retail sales.
- Competition and concentration are not a current regulatory concern in retail for policymakers. To continue capturing the benefits of online retail sales policymakers and regulators should: (i) incentivizing individuals and firms to adopt online channels in addition to physical channels; (ii) facilitating customer bank adoption to facilitate payments online; (iii) reduce logistic costs.

Appendix. A primer on the economics of retail and e-commerce

This Appendix draws a broad sketch of how retail works, introduces e-commerce on a historic perspective, discusses its role and benefits, and then drafts a primer on the economics and competition of two-sided platforms. By doing so, it serves the dual purpose of informing a wide audience on the benefits of retail and platforms when actual or potential competition is feasible and provides a warning against heavy-handed regulation in the future.

A.1. The dynamics of retail

The **wheel of retailing** is a cyclic theory of retail. It has four phases: entry, growth, maturity, and decline. Entry is marked by low prices, low retailer margins, and low customer awareness or affinity. Once a retailer has gained traction, it shifts its focus to expansion, investing in infrastructure to support a growth plan. During maturity, a retailer has reached a steady customer base where new customers offset customer losses (attrition due to higher prices charged). Loyalty and reputation allow to capture higher margins. During decline, the retailer is vulnerable to lower cost operations and greater flexibility of some new rivals entering the market with similar characteristics of the retailer in its own entry phase. Incumbent retailer loses customers to the new entrants faster than it can replace them. This does not guarantee incumbent retailers will be driven out the market. They can reinvent themselves through acquisition, divestiture, or strategic change. As emphasized by MBACKNOL (2022), the weakness of this model is its focus on costs, and inability to explain the continuing presence of profitable premium market specialist firms.

Retail accordion is another cyclic theory developed to explain how retailers choose the number and type of product categories they would retail, with the expectations that firms would go from general goods, towards more specific products, and then back to general goods again (MBACKNOL 2022). This pattern was observed in the UK: small general stores were the norm in many villages, where they were the only store. Once the village grew, more shops arrived, with increased levels of specialization; then specialized variants of the major supermarkets (smaller neighborhood stores came into action. As in the wheel of retail theory, there are weaknesses with this model, including the continuing presence of firms which appear to resist expansion of merchandise lines, and its focus only on the goods/merchandise aspect of retail.

Conflict theory is a non-cyclic theory of retail evolution based on the Marxian or Schumpeterian basic idea that for progress to be made in any environment there must be conflict, with new ideas taking the place of the older ideas and practices, which may then be emulated creating a hybrid or new format, which itself will eventually be replaced. In retail, this means that one firm, or format, will be challenged by new or competing firms and

formats. Once the new format becomes more effective, the older firms or formats will emulate the new ideas in a form of synthesis. For example, supermarkets have emulated the online shipping environment by offering online grocery shopping. And e-commerce firms are competing with supermarkets, as seen with Amazon offering a 'save and subscribe' service, to deliver regular items on a predetermined schedule, including some grocery items, and the launch of brick-and-mortar stores offering same day delivery in trial areas.

Intratype competition arises among retailers who are in the same line of business, selling the same goods to the same customers (for example, CVS and Walgreens are retailers of the same type which compete against each other for customers). **Intertype competition** emerges when retailers in different lines of business sell goods to the same customers (for example, Walmart, a supermarket might find itself in competition with AutoZone for car part). **Divertive competition** arises when a particular retailer faces both intratype as well as intertype competition (for example, chain pharmacies that offer limited articles of clothing, batteries, cosmetics, food and beverages and other merchandise in competition for customers with other pharmacies and grocery stores).

A.2. The evolution of e-commerce

E-commerce comprises all business transactions conducted over the internet and other telecommunication networks such as mobile telephony networks. The main e-commerce categories include consumer purchases on the internet (business-to-consumer, **B2C**); transactions between businesses (business-to-business, **B2B**); and transactions between customers (customer-to-customer, **C2C**). A company can participate in activities falling under different e-commerce categories and channels. For example, a restaurant might deliver orders received in a proprietary website or using an external order-and-delivery service, offer in-site client service, and purchase some of the ingredients in individual product websites or in web marketplaces.

Schneider (2017) characterizes three phases of e-commerce:

- **First wave:** 1995-2003. This was the 'boom' and 'bust' period of internet-related businesses (dot.com). Many of these start-up firms went out of business or were acquired between 2000 and 2003 to launch new online ventures. The internet technology for B2C was slow and expensive.
- **Second wave:** 2004-2009. The increase in broadband connections was instrumental for B2C to expand. Salespeople using laptops could maintain frequent contact with customers. E-mail started being used as part of the B2B and B2C seller's marketing and customer service routines.

- **Third wave:** 2010-Present. Mobile commerce (using smartphones and tablets) consolidated, e-commerce transactions ramped up in developing, highly populated countries, social networks allow advertising, promotion, and sales. An increasing number of smaller businesses digitalized some of their operations. Big data and other AI techniques allow a more precise match between advertising and client characteristics. Tracking technologies facilitate more sophisticated B2B and B2C management, especially in logistics management.

Sellers may use different business models on the internet. They include fee-for-content (e-books, music, and movies streaming), advertising-supported revenue (newspapers), fee-for-transaction (brokerage firms, event tickets, online banking and financial services, travel, and lodging), fee-for-service (online games, professional services).

A.3. The role and benefits of e-commerce

Firms use B2B models to make their supply chain (purchasing and logistics) more efficient and flexible and to reduce purchasing costs. B2B may reduce the necessity of large inventories and facilitate outsourcing. As well, it helps creating a customer-oriented culture supported by increasingly available tracking and tracing technologies.

Buyers frequently meet a lack of knowledge about how quality varies among products across firms (asymmetric information). The problem known as **adverse selection** comes from the fact that some products ('lemons') offered in the marketplace are low quality, and their characteristics are difficult to observe. In the limit, adverse selection may lead to a generalized reduction in product quality. Guarantees and warranties have been used for a long time in commerce (both electronic and brick-and-mortar) to avoid the lemons problem. Both B2C and C2C may use supplier ratings by costumers that are publicly displayed online. C2C firms may coordinate auctions of highly diverse items providing information intermediation services giving buyers the option to assess seller's reputation from his track record.

E-commerce marketplaces facilitate and promote the structural change in the retail sector. The mobility restrictions due to the pandemic forced many stores to transform the way they do business to continue providing their goods and services. Such a transformation in their internal dynamics goes hand in hand with the boom of the digital trading ecosystem, which allow the customers to find different brands in a single website, thus increasing the potential purchase.

E-commerce expansion will increase market efficiency by reducing the cost of purchase and time of search for products, and the cost of time of acquisition. (VanHoose 2011: 152) reminds that market efficiency is more easily reached when there exist numerous competing

products, so that prices in an industry respond to changes in the cost of producers and the evolution of preferences. When there exist information asymmetries among customers and products, a price-quality trade-off may arise. The 'law of one price' is thus unlikely to hold. Anyway, early studies on retail pricing, such as the conducted by Abate and Harris (quoted by VanHoose) for more than 100 items traded via e-commerce are 13 to 15 percent lower than those traded in moderately priced retail outlets.

A.4. Two-sided markets: basics

A **two-sided market** is composed of an intermediary (**platform**) that produces goods or services that link two groups of users (sides) such that each group perceives the value of its participation as greater when the size of the other group rises (VanHoose 2011:159). Platform-driven e-commerce is a **network industry**, where the value placed by consumers on the goods or services that industry produce varies with the number of other people who consume the item (VanHoose 2011: 47). It must be emphasized that not every e-commerce activity generates network externalities. For example, a restaurant restricted to receiving orders in a proprietary web page will have little network effects.

With at least two groups of end users, platform value may depend on the number users in the same group (**within-group effect**); or the number of users in the other groups(s) (**cross-group effect**); or a combination of both. A **direct network effect** arises if a user's utility increases with the number of users of the same group, as it happens to occur with social networks. An **indirect network effect** arises if a user's utility increases with the number of users on the other sides (most of the electronic marketplaces).

A pragmatic classification of two-sided markets includes:

- **Matchmaking markets.** In this market, a platform provides services that help end users of each side identify corresponding end users on the other side with common interests. Examples: online auction services, online brokers, online headhunters, residential realtors, and most of B2B exchanges. The platform applies a matchmaking technology and charges membership fees to one or both sides of the platform. TripAdvisor acts a pure infomediaries by aggregating information, while Amazon provides matching, support, and delivery.
- **Audience-making markets.** In this market, a platform brings together audience and advertisers. It is mostly used in the entertainment business. Platforms of this sort often provide some variety of content. For example, internet portals may provide news, podcasts, and blogs to attract potential clients and advertisers. The platform charges fees to advertisers (fixed or variable), which depend on several factors such as willingness to

pay and frequency of use. For example, online newspapers may offer full or subscription or partial or temporary access (Sunday editions, specialized columns).

- **Shared-input markets.** In this market, end users (producers) on one side of the platform require an input from the platform to reach the participants on the other side of the platform. For example, Microsoft provides the operating system Windows such that computer producers can reach computer users. Licensing fees are generally paid by customers on an annual basis, and the producer commits to permanently upgrade the product.
- **Transaction-based market.** In this market, a platform provides transaction-clearing services to enable exchanges between groups of customers. For example, a credit card collects payments from cardholders to cover payment to retailers. Cardholders may pay fixed membership or by-transaction fees for the right to use the cards issued by the platform.

A.5. Two-sided markets: pricing and strategies

Assume a setting in which a platform links Group A and Group B of end users, and charges a per-unit fee only (P_A and P_B , respectively). Thus, the total overall per-unit that the platform collects is $P = P_A + P_B$. When the aggregate volume of good or services traded via the platform depends only on P (total price), there is a one-sided pricing structure *despite the market's two-sided structure*. In this context, an increase (decrease) in P_A totally offsetting a decrease (increase) in P_B leaves total quantities sold unchanged. In this simple setting, no distinction between the two sides of the market is necessary from a pricing perspective. If the overall demand is sufficiently inelastic, the platform's revenue will rise *when P increases*, and if the overall demand is sufficiently elastic, the platform's revenue will rise *when P decreases*.

Suppose now that Group A and Group B are affected differently by network spillovers generated by a change in the number of customers in Group B and Group A, respectively. It might be the case that fully offsetting changes of P lead to different reactions on both sides of the platform. For example, an increase in P_A may reduce the number of Group A users such that the correspondent decrease in P_B may not increase the number of Group B users exactly. The total quantity traded may rise or fall, depending on whether the intensity of network externalities on each side of the platform.

This suffices to illustrate that different network externality impacts on each side in a platform lead to differing profit and welfare profiles which depend on a two-sided pricing structure. To maximize profits (i.e., to **balance** platform prices), the platform must evaluate (i) several configurations of network externalities (low or high), (ii) demand elasticity on each side of the platform (inelastic or elastic), and (iii) different price changes on each side of the platform

(increments or reductions in price on both sides, or a combination of increments and reductions in one and other side of the platform).

The more sensitive demand is, the lower is the price charges, and network effects add positive feedback to the price dynamics. In some cases, balancing may require charging zero or a negative price (subsidy) to one platform side, either temporarily or on a permanent basis. In this setting, it is said that there is **a subsidy side + a money side**. For example, a zero-pricing strategy has been deployed in the newspaper industry for some or all online content. A platform with imperfect competition could potentially set positive prices on one group that are above competitive levels to fund the subsidization of the other group (cross subsidization). The net impact is ambiguous, as total welfare may increase or decrease depending on the respective price elasticities of every group.

With **bundling**, goods, and services that customers have a different willingness to pay are packaged in a single offer. This increases seller's revenue if the offer includes items that some consumers would not otherwise have bought. For example, a flight comparison platform (like Kayak or Expedia) that also allows lodging bookings and flight reserves usually offers travel packages at a lower cost than the hotel and the flight purchased separately.

A.6. Multihoming and competition among platforms

When an end user interacts with only one platform, she is **singlehoming**. In turn, **multihoming** is the choice by an end user to interact with more than one platform in a two or multiple-sided market. Consumers are likely to use only one price comparison website if they think that a product can be found on multiple platforms. Conversely, when one side decides to single-home, the other side of the market could multi-home to reach more matches. For example, if readers are loyal to a specific newspaper, advertisers will place announcements across several newspapers to increase their reader's base.

Belleflamme and Peitz (2019) extend the analysis of Armstrong (2006) by comparing a market setting in which one side singlehomes (seller) and the other multihomes (a configuration called **competitive bottleneck**) to one in which both sides singlehome. If initially both sides singlehome, each platform provides users on one side exclusive access to its users on the other side. If then one side multihomes, platforms compete on the singlehoming side and exert monopoly power on the multihoming side. Belleflamme and Peitz (2019) summarize their findings as follows: (i) sellers, buyers and platforms may end up all better off when sellers multihome; (ii) whenever platforms benefit from exclusivity, they hurt buyers and possibly sellers; platform restrictions to seller multihoming should be prohibited; and (iii) whenever buyers suffer from seller multihoming, platforms and sellers benefit from it.

Multihoming may be in the best interest of both sides when locational or other kind or arbitrage opportunities are present. For example, cab drivers may join several online cab aggregators to maximize taxi usage and taxi customers may join several mobile cab aggregators to reduce waiting time to find a taxi. In this case, multihoming does not rely on product differentiation. Johnson (2020) states that multi-homing expansion may also rely on how differentiated rival platforms are. For example, movie fans may wish to subscribe to two or three alternatives among Hulu, Apple TV+, Netflix, HBO Max, and Amazon Prime Video. Though all these platforms provide video streaming, users are likely to see them as offering differentiated products. The need to multi-home is reduced because users on the other side already do this.

As Demary and Rusche (2018) state, crucial for multihoming are switching costs and the costs of becoming a user of a platform, because when switching costs are very high, the platform locks the user in (Shapiro and Varian 1999). Innovation plays a key role in fostering competition in the digital economy. Even if one firm has significant market power, it can be quickly driven out of the market by a firm offering a more innovative product. This phenomenon is known as **leapfrog competition** (Grave and Nyberg, 2017; quoted by Büchel and Rusche 2020). The innovative entrant deploys the same upwards spiral effect facilitated by strong reinforcing indirect network effects that enabled the incumbent to attain a dominant market position. One recent example is the rise of TikTok, which offers a combination of social network and video-on-demand where the videos are users-made. This platform gained more than 1 billion users with new features within a short period of time and entered markets where YouTube and Facebook have significant market power. This means that dominant firms must constantly adapt and innovate to remain in business.

Concentration measures in platforms matter less than performance. Büchel and Rusche (2020:5) argue that a concentrated market might be preferable to a to disperse market and could also be beneficial for all platform sides because they can spread fixed cost among many market participants and reduce search costs as well. In their paper on competition policy for platforms, Jullien and Sand-Zantman (2020) review the results of Biglaiser and Crémer (2020; BC) and Cabral (2011; C). In the BC review, an incumbency advantage creates barriers to entry which may be undermined by dynamic competition: the initial advantage may be not suffice for a less efficient incumbent which everyone chooses when there is uncertainty to maintain its dominant position. A high-quality entrant may charge low prices at the earliest date possible, sacrificing a lot initially, to benefit from its superior quality in the long term. Entrant pricing (increasing path) must reflect an optimal sequencing of network and quality effects. In the C review,

For the sake of completeness, we mention the role of **gatekeeper**, which is unlikely to occur on a permanent basis in retail, both because of short-term competition with low switching costs through several channels and by the medium and long-term dynamics of leapfrog competition and the pervasive presence of creative conflict in the sector. The European Commission considers platforms with a gatekeeper role mostly in B2C markets: 'Online platforms exert a gatekeeper role if business users are increasingly dependent on one online platform with market power, for example due to strong indirect network effects and data-driven-advantages, to get in contact with their customer'. Büchel and Rusche (2020) argue that digital platform acts as a gatekeeper in the underlying platform ecosystem if there are very few, if any, alternative intermediation services available, and it has a large impact on the market(s) due to its durable and stable market power, while still being highly relevant for users from all sides of the platform.

Multihoming, by offering more alternatives to end users, should reduce the chance of price discrimination or cross-subsidization in platforms, or the scope to engage in imperfectly competitive pricing. Multihoming push platforms to compete on both price and quality. Platforms will be restricted on both sides because end users can easily move to a competing platform. For example, within the set of **online marketplaces**, both sellers and buyers may have the option of using alternative platforms (e.g., Amazon, Mercado Libre, or eBay).

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Fedesarrollo

Calle 78 # 9 - 91, Bogotá, Colombia.

Teléfono: (601) 3259777

  @Fedesarrollo
