Examining the Relationship of Electronic Commerce in the Total Sales of Colombian Commercial SMEs: a Look Between the Years 2012 and 2016 in a Developing Country in South America

Artículo de investigación

Examining the Relationship of Electronic Commerce in the Total Sales of Colombian Commercial SMEs: a Look Between the Years 2012 and 2016 in a Developing Country in South America

Examinando la relación del comercio electrónico en las ventas totales de las pymes comerciales colombianas: una mirada entre los años 2012 y 2016 en un país en desarrollo de América del Sur

Examinando a relação do comércio eletrônico nas vendas totais das PME comerciais colombianas: Um olhar entre 2012 e 2016 em um país em desenvolvimento na América do Sul

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SUMMARY: This paper aims to explore the relationship between electronic commerce and the total sales in Colombia, a developing South American country, seen from small and medium enterprises (SMEs) with mainly commercial activity. For this purpose, based on the databases provided by the National Administrative Department of Statistics (DANE for its acronym in Spanish), a longitudinal panel was elaborated for the years 2012 to 2016 analyzing 2705 SMEs, comparing those that claimed to have incorporated electronic commerce and those that had not developed such strategy yet. For that end, the Kolmogorov-Smirnov tool has been used to determine how the data is presented, resulting in non-parametric distributions. On the other hand, the Mann Whitney U statistical tool was applied to find the relationship between the variables examined. For both, small and medium enterprises, the statistical results do not show any association between the total sales of the companies that have developed part of their sales through online commerce and between those that have not developed sales in this way. This is because of the low expansion of e-commerce in Colombian SMEs, leaving a high potential to implement it in the country and adhere to a worldwide trend.

Keywords: Electronic commerce, information technology, small enterprises, management.

RESUMEN: Este documento tiene como objetivo explorar la relación entre el comercio electrónico y las ventas totales en Colombia, un país sudamericano en desarrollo, visto desde pequeñas y medianas empresas (pymes) con actividad principalmente comercial. Para este propósito, basados en las bases de datos proporcionadas por el Departamento Administrativo Nacional de Estadística (DANE), se elaboró un panel longitudinal para los años 2012 a 2016 analizando 2705 pymes, comparando las que afirmaron haber incorporado el comercio electrónico y aquellas que aún no han desarrollado dicha estrategia. Para ese fin, se ha utilizado la herramienta Kolmogorov-Smirnov para determinar cómo se presentan los datos, dando como resultado distribuciones no paramétricas. Por otro lado, se aplicó la herramienta estadística U de Mann Whitney para encontrar la relación entre las variables examinadas. Para ambas, pequeñas y medianas empresas, los resultados estadísticos no muestran ninguna asociación entre

las ventas totales de las compañías que han desarrollado el comercio en línea y entre aquellas que no han desarrollado ventas de esta manera. Esto se debe a la baja expansión del comercio electrónico desarrollado en las pymes colombianas, lo que deja un alto potencial para implementarlo en el país y adherirse a una tendencia mundial.

Palabras clave: Comercio Electrónico, tecnología de la información, pequeña empresa, gestión.

SUMÁRIO: Este documento tem como objetivo explorar a relação entre o comércio eletrônico e as vendas totais na Colômbia, um país em desenvolvimento da América do Sul, visto desde as pequenas e médias empresas (PME) com atividade principalmente comercial. Para esse fim, com base nas bases de dados fornecidas pelo Departamento Administrativo Nacional de Estatística (DANE), foi preparado um painel longitudinal para os anos de 2012 a 2016, analisando 2705 PME, comparando as que afirmavam ter incorporado o comércio eletrônico e as que ainda não desenvolveram essa estratégia. Para esse fim, foi usada a ferramenta Kolmogorov-Smirnov para determinar como os dados são apresentados, resultando em distribuições não paramétricas. Por outro lado, foi aplicada a ferramenta estatística U de Mann Whitney para encontrar a relação entre as variáveis examinadas. Para as pequenas e médias empresas, os resultados estatísticos não mostram associação alguma entre o total de vendas de empresas que desenvolveram comércio on-line e entre as que não desenvolveram vendas dessa maneira. Isso se deve à baixa expansão do comércio eletrônico desenvolvido nas PME colombianas, o que deixa um alto potencial para implementá-lo no país e aderir a uma tendência global.

Palavras-chave: Comércio Eletrônico, tecnologia da informação, pequena empresa, gestão, Colômbia.

Electronic commerce (EC) has had a rapid evolution since its appearance around the 90s. Like other tools that use innovative technology, it grows and is updated to become one of the main commercial channels known today. In this way, it becomes an alternative for products and services around the world that provides opportunities for organizations. This is how this document aims to analyze the behavior of SMEs regarding sales made by electronic commerce and to know the perception of companies with mainly commercial activity. For this, the information provided by the National Administrative Department of Statistics was studied for determine the relationship that exists between the EC and the total sales developed in each of the periods studied.

Understanding the behavior of EC has become a topic of interest for many researchers. Some have studied it from developed countries and others have observed its behavior from developing countries, finding significant differences among them. This article aims to describe the relationship between EC and the total sales made by the SMEs in Colombia, a South American country, seen from the perspective of SMEs with a mainly commercial economic activity. These firms have been created from a traditional sales method and because of their needs and the market, they have had to adopt e-commerce strategies to strengthen their commercial strategy and be linked to the new trends that are established in the organizational, regional, national and global context.

In this sense, knowing how the EC can be related to the total sales of the company can summarize the behavior of EC in the country and how the government can intervene to achieve greater adoption to those companies that have not implemented yet. It must be noted that the present work does not rely on any theory or model on the subject. However, it seeks to establish the behavior of the EC through a panel between the years 2012 to 2016 in Colombian SMEs, and to know, from an empirical point of

view, the perception the companies have about the adoption of EC and its relation with the total sales of the enterprises.

The structure of this paper is composed of a theoretical framework that exposes some differences between how electronic commerce is conceived in developing and third world countries. Subsequently, some research has been presented related to the topic to arrive at the method of the study and its results. Finally, the conclusions will be presented intending to have some approximations about the behavior of e-commerce in Colombian SMEs.

THEORETICAL FRAMEWORK

Information and Communication Technology (ICT)

It is unquestionable that both information and communication need each other. Just as information needs to be communicated, in the same way, communication needs the information to be transmitted. Necessarily communication must carry information. That is why ICT has revolutionized continuously and permanently in recent decades' influenced by the need of the human being to communicate each other.

Hereupon, technology, information and communication form a tool for humanity, today known as Information and Communication Technologies (ICT). Thereon, Giner de la Fuente (2004) expresses that ICTs are the fuel of the knowledge society since it encourages the production and exchange of information. In the same way, Maristany, Ruiz, and Blázquez (2008, p. 109) affirm that they are "fundamental pieces in the current economic and business world. Its implementation in the company allows the modernization and streamlining of processes and increases the levels of productivity and competitiveness."

From another point of view, Bytheway (2014) states that sometimes this concept is qualified as simplistic when is used only to describe technical components such as hardware or software. He argues that the term ICT should have a wider, complex and expandable application that affects people, companies, communities or public administrations, promoting changes in society. Therefore, organizations must have the skills and abilities to design the technologies and turn them into useful systems for the company and the stakeholders.

In this way, the term moves away from the traditional concept and adheres to a more systemic and holistic perception, which meets the organizations and clients. This is how new information technologies are constituted into a society that is increasingly incorporated into different technological models that influence the social, political, economic and business models of our society giving rise to EC. In such a way, Potter, Lalwani, Disney and Velho (2003), cited by Davies, Mason and Lalwani (2007, p.16) affirm that "developments in ICT e-commerce are having a profound impact on the availability and usability of data and the speed of flow of information within the supply chain" making EC a great tool that can change many companies and societies.

The EC has become an indispensable piece in modern life. Online shopping reveals several advantages, such as flexibility, speed and convenience for both customers and sellers compared to traditional sales (Yuan, Xu, Li, & Lau, 2018). The above suggests the existence of a reduction in transaction costs because of the automation of processes and disintermediation (Molla & Heeks, 2007), the minimization of transport and delivery costs, physical limitations, space, time (Nejadirani, Masoud, & Reza, 2011) and support for the value chain (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011).

In another context, implementing this tool has changed the relationships of power and the global market (Slavko, 2017) significantly influencing the economy and society (Jingqiao, 2017). It has also revolutionized the way of doing business and has provided a lot of information and useful purchasing methods (Ashraf, Thongpapanla, & Spyropoulou, 2016) for the global collective interest and organizations. These have to take advantage of the scope it provides to cover new markets and through the Internet to revolutionize everyday life through the intelligent use of this tool.

Although there are positions stating that organizations with a larger size, better ratios in the number of electronic technological applications and higher productivity, are more likely to adopt electronic commerce (Ting-Kun, Chun-Hung, & Wen-Cheng, 2015). Other authors affirm that this has a great potential to promote the growth of small and medium enterprises (SMEs) in developed and third world countries in the same way (Kurnia, Choudrie, Mahbubur, & Alzougool, 2015).

However, the operational results allow observing the contrast between nations, which shows large gaps manifested in different economies. Inequalities in the cultural, social, economic, political and technological conditions of developing countries face several problems and concerns that differ from those faced by developed countries (Kurnia, Karnali, & Rahim, 2015). This highlights what was raised by Alyoubi (2015) when he affirms that most developing countries are far from experiencing the benefits of electronic commerce because of factors that act as obstacles.

From this point of view, their conditions within the EC are necessarily different, since the internal and external environment varies drastically from one nation to another. In this sense, its adoption in most Third World countries has been hampered by quality and infrastructure (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011), so researchers cannot affirm that the results of an investigation has the same impact on comparable countries (Vučković, Vukmirović, Milenković, Ristić, & Prljić, 2018). However, their knowledge can help to visualize panoramas that help to correct, prevent or mitigate similar experiences, so that EC can help to develop economies getting more benefits (Sanabria Díaz, Torres Ramírez, & López Posada, 2016) as the increase in sales after its implementation.

Electronic Commerce (EC)

The core of this paper was built based on EC. That is why it is important to show some reflections about this term. To that effect, Turban, Whiteside, King and Outland (2017, p. 6) define it as the use of the ' 'Internet and other networks (e.g., intranets) to purchase, sell, transport, or trade data, goods, or services." Nisar and Prabhakar (2017, p. 137) complement this definition affirming that "e-commerce concerns not only the function of buying and selling goods and services online, it also facilitates the entire purchasing and selling processes for both sellers and buyers." Gunasekaran and Ngai (2005, p. 142) complement it when they say that EC "promotes open communication and a virtual interactive the environment in which suppliers and customers can exchange information and products." These explanations contain a consensus where ICT is the developer vehicle of EC and the way all the authors give strictly corporate connotations when they give a clear meaning of buying and selling operations of goods and services as the fundamental basis of these transactions. Its importance is such that Drucker (2013, p. 107) argued that "E-commerce is to the Information Revolution what the railroad was to the Industrial Revolution."

This is how the tool is changing the way of doing businesses, reducing processes and facilitating the interaction between the user and the companies. In this respect, Broome (2016, p. 32) declared that EC "has brought considerable changes in the economics of marketing channels, and changes in economic sectors and patterns of physical distribution, erasing in the process many of the physical constraints that impeded business expansion in the past." Similarly, Thompson and Ranganathan (2004, p. 89) giving it a more extensive meaning said that "e-commerce on the Internet goes beyond buying and selling electronically as it involves a wide variety of pre- and post-sales activities, such as advertising, maintaining business relationships, and enhancing business communication."

Thus, it is clearly visualized how, as the years go by, more elaborate definitions are created. In the beginning, the authors refer to transactions made electronically between companies and consumers through ICT, always giving it great importance affirming that its development would influence the local and international economies. Subsequently, these transactions created new scenarios where new strategies for distribution, production and management processes emerge, allowing organizations to create new ways to sell and make more efficient processes. The characterization of this concept presents a holistic approach, where not only technology intervenes, but also there is a business model different from the traditional where it must conceive the entire value chain of a company that must be implemented both physically and virtually. That is how "E-commerce enables firms to reduce telecommunication costs, minimize warehousing expenses, and cut down the distribution chain" (Quaddus & Achjari, 2005, p. 129).

Differences between e-commerce and e-business

When addressing EC, it is necessary to determine the differences that may exist between this term and e-business. Two expressions that, although they present conceptual divergences between several authors, their understanding for the present study becomes important. On the one hand, some similarly handle the terms. For Mazzarol (2015) and Tassabehji (2003), these terms are used interchangeably. However, there are other positions where some differences are manifested. Turban et al. (2017, p. 7) declared that "E-business refers to a broader definition of EC, not just the buying and selling of goods and services, but conducting all kinds of business online." For Xu, Alhindi, Ishizaka, and Martin (2016) it "refers to incorporating Internet technologies into an entire enterprise's operations and management and beyond. E-commerce refers to essentially online transactions involving buying and selling."

On this basis, it is possible to visualize how e-business covers a much more extensive field than does EC. Therefore, it is important to clarify that only buying and selling through the Internet will be studied, rather than understand the entire supply chain, technological processes, logistics and other processes used in e-business. At this point, Falk and Hagsten (2015, p. 357) definition is taken for this research where "e-commerce is defined specifically as e-sales - that is, orders firms receive electronically (through EDI or websites)."

Categories of E-commerce

There are many authors (Abascal Rojas, 2002), (Lara Navarra & Martínez Usero, 2002), (Laudon & Laudon, 2004), (Mohapatra, 2013), (Moro Vallina & Rodés Bach, 2014), (Caballero, 2016) who are agreed with the types of electronic commerce according to the authors; that means those who take part in the transactions made by EC. In a wide and strict way, Schniederjans, Cao and Triche (2014) raised nine categories shown in Table 1.

Table 1
Categories of E-commerce.

To From	Customer	Business	Government
Customer	Costumer to Costumer (C2C)	Costumer to Business (C2B)	Costumer to Government (C2G)
Business	Business to Consumer (B2C)	Business to Business (B2B)	Business to Government (B2G)
Government	Government to Costumer (G2C)	Government to Business (G2B)	Government to Government (G2G)

Note: Source Cao and Triche (2014).

The aforementioned authors give importance to the types of business B2B (business to business) and B2C (business to consumer), being them the most used. This study will focus on them.

According to Hsu, Westland and Chiang (2015) these terms emerged in the mid-nineties and their use is constantly increasing. The B2B refers to e-commerce transactions between companies. "Is used to describe electronic exchange, web-based auctions and various other applications that automate the interaction of firms with their suppliers and corporate clients" (Vulkan, 2003, p. 59). In a similar vein, Alsaad, Mohamad and Ismail (2017, p. 157) affirmed that "B2B EC manifests itself as Internet-based technologies that mediate and facilitate transactions between buyers and sellers (trading partners) locally and around the world." The importance of this business (B2B) is so great that "about 80% of e-commerce is of this type, and most experts predict that B2B e-commerce will continue to grow faster than B2C segment" (Mohapatra, 2013, p. 77). In the same context, Zhao, Wang y Huang (2008, p. 242) said that the transaction volume is l0 times more than it is B2C. Also, Dlabay, Burrow and Kleindl (2015, p. 274) sustain that "these online exchanges are the largest and fastest-growing segment of e-commerce." In this respect, Kumar and Sareen (2012, p. 24) stated that "B2B e-commerce has revolutionized business relationships between the organizations and has been touted as an important driver for economic growth particularly in developing countries."

Conversely, the B2C EC is when "consumers browse product information pages on business websites, select products and pay for them at online checkout, using a credit or debit card, or other electronic payment mechanism" (Stimpson & Smith, 2015, p. 454). In a similar way, McKinnon, Browne and Whiteing (2012, p. 332) define it as a "simply electronic retailing using the internet as a medium to place orders for goods, with the consumer interacting directly with the supplier's system."

BACKGROUND AND RELATED WORK

The study of small and medium enterprises has become a topic of interest in the world and even more when it involves innovation and technological processes such as electronic commerce. Worldwide, some of the most relevant studies were those developed by Rahayu and Day (2015) based on a survey of 292 SMEs in Indonesia, they found that the perceived benefits, the technological preparation, the innovation of the owners as their ability in Information Technology (IT) and experience are the determining factors that influence its adoption (p. 192). Alam, Ali and Jani (2011) found in 200 SMEs in Malaysia that the relative advantage, compatibility, organizational readiness, manager characteristics and security have a significant impact on the adoption of online commerce (p. 373).

In Latin America some of the most relevant research were developed by Altobello Nasco, Gradón Toledo y Mykytyn Jr (2008) where they used the Theory of Planned the behavior to predict varied behaviors

and their intentions to use EC. The instrument was applied to 212 managers and owners in Chilean SMEs. The results showed that the subjective norm and attitude constructions predict intentions positively and meaningfully, but the construction of perceived behavior control does not (p. 697). Using the same system and in the same country, Grandón y Ramírez-Correa (2018) with a sample of 210 questionnaires focused on SMEs, concluded that there are strong and significant relationships between the attitude and intention of the owner or manager to use EC.

In Argentina, especially in the city of Córdoba, Jones, Motta and Aldarete (2016) studied 139 micro, small and medium enterprises. They analyzed the causal factors of the EC. The results show that ICT management control systems as its strategy and organizational and environmental factors have a positive influence on its adoption.

In Colombia, Gomez-Trujillo, Alzate Rendon, Manotas Rodríguez and Boada (2019) analyzed 149 SMEs in the Valle de Aburrá, finding that although companies have a website, they are not used to increase sales, they are only used to be seen by their customers. Sánchez Alzate and Montoya Restrepo made a similar conclusion (2017) in a medium-sized study conducted in Palmira - Valle. It showed that these companies "do not have specialized e-commerce platforms, which is why their Internet sales are tiny. The main thing is that they do not know the potential of this technological resource and they perceive electronic commerce as insecure" (p. 56).

In another context, Corrales Liévano and Gil Herrera (2018) conducted a study with 451 companies in Colombia where they try to establish the impact of EC on organizational growth. With medium-sized companies, it was evidenced that those that have implemented EC have grown larger in the sales, operational profit and personnel hiring indicators. For the case of small-sized companies, the ones who have implemented it have grown to a greater extent in the indicators mentioned above, adding the total assets.

METHOD

The present descriptive study has been elaborated in two phases. In the databases provided by the National Administrative Department of Statistics (DANE) were taken. With them, a longitudinal panel was elaborated for the years 2012 to 2016, comparing those SMEs that claimed to have incorporated the EC as those that had not developed such strategy. The distribution of the companies that were studied is presented in Table 2:

Table 2
Companies studied within the panel 2012 -2016 with and
without Electronic Commerce and their respective percentage.

Year	Characteristic	Small-sized company		Medium-sized company		Year	
		Number	Percentage	Number	Porcentaje	Number	Percentage
2012	With CE	412	10,48%	270	6,87%	682	17,35%
	Without CE	2293	58,35%	955	24,30%	3248	82,65%
	Total 2012	2705	68,83%	1225	31,17%	3930	100,00%
2013	With CE	482	12,26%	303	7,71%	785	19,97%
	Without CE	2223	56,56%	922	23,46%	3145	80,03%
	Total 2013	2705	68,83%	1225	31,17%	3930	100,00%
2014	With CE	564	14,35%	335	8,52%	899	22,88%
	Without CE	2141	54,48%	890	22,65%	3031	77,12%
	Total 2014	2705	68,83%	1225	31,17%	3930	100,00%
2015	With CE	617	15,70%	364	9,26%	981	24,96%
	Without CE	2088	53,13%	861	21,91%	2949	75,04%
	Total 2015	2705	68,83%	1225	31,17%	3930	100,00%
2016	With CE	624	15,88%	391	9,95%	1015	25,83%
	Without CE	2081	52,95%	834	21,22%	2915	74,17%
	Total 2016	2705	0,68829517	1225	0,31170483	3930	100%

Note: (1) Own source based on data provided by DANE. (2) It presents the distribution by small and medium enterprises of the sources that were studied in the present research. (3) The percentage was obtained by dividing the number of companies with each characteristic described and was divided by 3930, which corresponds to the total number of sources studied for each of the years that make up the panel.

In a first approach to determine the behavior of total operational sales compared to the use of EC, we take the summation of the total sales for each year, discriminating it by those companies that presented online commerce and those that did not. From it, the percentages of growth of both groups of companies were established by comparing the year-over-year change for each period in the 5 years studied.

The second procedure applied to the aforementioned base was the Kolmogorov - Smirnov tool to determine the distribution of each of the data taking a level of significance *a* of 5% with a confidence level of 95%, where the null hypothesis will show a normal distribution and the alternative hypothesis will show that the data do not follow a normal distribution. As shown in the results section, the data do not have a normal distribution.

To determine the relationship between the total sales of companies (quantitative variable) in the use or not of electronic commerce (a dichotomous variable), the Mann-Whitney U-test was applied for two independent tests in each of the years and companies studied. Through it, the relationship between the use or not of electronic commerce and total sales for each of the periods studied was examined.

RESULTS

As it was mentioned in the previous section, to determine the effect that electronic commerce has on the sales of Colombian SMEs, an analysis was developed where the total sales of companies with and without CE were added. The results are shown in Table 3:

Table 3
Total sales of companies with and without electronic commerce.

Year	Characteristic	Small-sized company		Medium-sized company	
		Sales	Percentage	Sales	Percentage
2012	With CE	$ 3.832.242.770	14,42%	$ 9.523.742.992	25,41%
	Without CE	$ 22.742.977.329	85,58%	$ 27.960.938.429	74,59%
	Total 2012	$ 26.575.220.098	100,00%	$ 37.484.681.422	100,00%
2013	With CE	$ 4.535.194.581	16,91%	$ 11.747.588.068	29,99%
	Without CE	$ 22.291.709.471	83,09%	$ 27.427.666.205	70,01%
	Total 2013	$ 26.826.904.051	100,00%	$ 39.175.254.273	100,00%
2014	With CE	$ 5.664.933.928	19,19%	$ 13.276.429.004	25,01%
	Without CE	$ 23.856.664.071	80,81%	$ 39.802.719.161	74,99%
	Total 2014	$ 29.521.597.999	100,00%	$ 53.079.148.165	100,00%
2015	With CE	$ 6.778.403.586	22,85%	$ 14.752.630.542	30,00%
	Without CE	$ 22.889.683.662	77,15%	$ 34.419.840.494	70,00%
	Total 2015	$ 29.668.087.248	100,00%	$ 49.172.471.036	100,00%
2016	With CE	$ 6.840.873.746	22,22%	$ 17.140.833.699	30,20%
	Without CE	$ 23.941.912.453	77,78%	$ 39.617.613.720	69,80%
	Total 2016	$ 30.782.786.199	100,00%	$ 56.758.447.419	100,00%

Note: (1) Own source based on data provided by DANE. (2) The values of the total sales are given in thousands of Colombian pesos. (3) The values described are the sum of each of the sales reported by each company that is included in the anallyzed database provided by DANE, separating by those that reported having or not electronic commerce.

The behavior of the groups of the companies studied with respect to the use of the EC have totally different behaviors. While those that had EC show increases in sales for each year, those that have not show completely dissimilar behaviors. Figure 1 represents it:
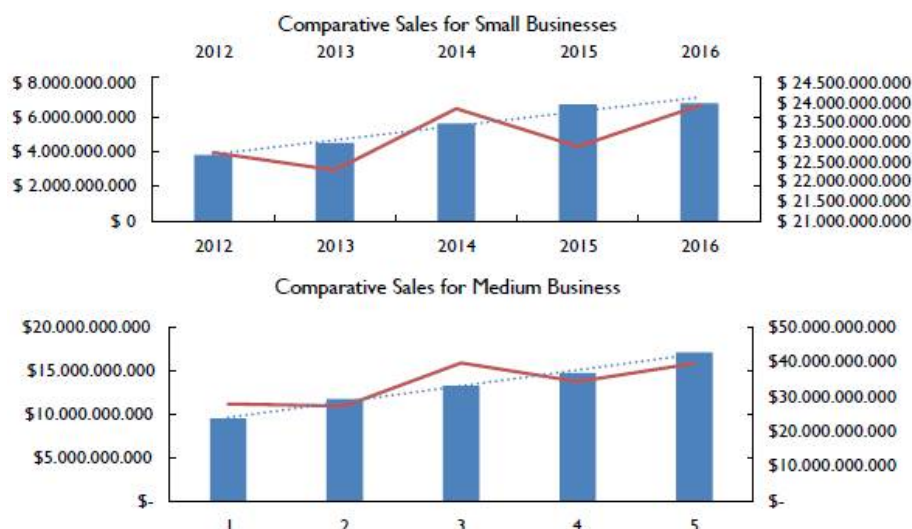
Figure 1

Comparative Sales between companies that own and do not
Electronic Commerce for small and medium enterprises.

Note: (1) Own source based on data provided by DANE. (2) The values of the total sales are given in
thousands of Colombian pesos. (3) Two graphs are presented, one for the small business and the other
for the medium business. (4) The sales figures described on the right side represent the companies that
have implemented EC and they are shown as bars in the graph. (5) The sales figures described on the left
side represent the companies that have not implemented EC and they are shown as lines in the graph.

This information allows to demonstrate the behavior, in terms of sales, of SMEs in Colombia. While those companies that have not implemented the EC present different performances, since there are years that their sales are below of those of the previous year, those who have use this tool, in the course of the 5 years studied, have presented increases in sales, both for the small and medium-sized company.

Another important issue to be discussed is how the use of EC has evolved in the companies studied. It has been shown that although the use of online commerce has increased progressively in the firms, the scarce utilization reflects, that at most, only 24.96% of the companies used EC. This figure was given for the year 2016.

Having already determined the number of companies that use electronic commerce in the country, it is necessary to define the amount of sales that have been made through online commerce for each of the years studied and compare with the total sales. Table 4 will show the results:

Table 4

Total sales of companies with and without electronic commerce.

Year	Characteristic	Small-sized company Sales	Medium-sized company Percentage
2012	Total sales through EC	$ 1.168.016.552	$ 2.260.994.708
	Total traditional sales	$ 26.575.220.098	$ 37.484.681.422
	Percentage of sales through **EC**	4,40%	6,03%
2013	Total sales through EC	$ 1.256.022.911	$ 2.426.194.884
	Total traditional sales	$ 26.826.904.051	$ 39.175.254.273
	Percentage of sales through **EC**	4,68%	6,19%
2014	Total sales through EC	$ 1.497.851.269	$ 2.826.914.920
	Total traditional sales	$ 29.521.597.999	$ 53.079.148.165
	Percentage of sales through EC	5,07%	5,33%
2015	Total sales through EC	$ 1.725.615.791	$ 3.032.004.611
	Total traditional sales	$ 29.668.087.248	$ 49.172.471.036
	Percentage of sales through EC	5,82%	6,17%
2016	Total sales through EC	$ 1.934.544.076	$ 3.818.858.073
	Total traditional sales	$ 30.782.786.199	$ 56.758.447.419
	Percentage of sales through EC	6,28%	6,73%

Note: (1) Own source based on data provided by DANE. (2) The values of the total sales are given in thousands of Colombian pesos. (3) The values described here are the sum of each of the sales reported by each company, separating them by those that reported having or not electronic commerce.

It is interesting to describe the behavior of sales in the two groups studied. While in the small business the actual sales and the percentage have always grown, in the case of the medium-sized company, despite having increased the total amount of sales through EC, the percentage decreases for the years 2014 and 2015 with respect to 2013. The above shows that the total sales were greater than what was sold through this method.

Once again, the low proportion of sales through e-commerce is evident. For small businesses the highest percentage was obtained in 2016 with 6.28%, while the medium-sized company, for the same year it reached 6.73% of sales in this way. This allows to visualize the scarce use of the EC to sell products and even more, comparing it with the data in Table 2, where only 22.22% of small businesses use this tool and in the median only 30.20%.

In a second instance, to determine the behavior of the data, it was necessary to have statistical evidence of its behavior. From here, the Kolmogorov - Smirnov normality test was used to establish if the analyzed data is parametric or not. The results are shown for each of the years and group of companies studied in Table 5:

Table 5

Kolmogorov - Smirnov test for one sample per year and group of companies studied.

		Small sized company				
		SALE 2012	**SALE 2013**	**SALE 2014**	**SALE 2015**	**SALE 2016**
N		2705	2705	2705	2705	2705
Normal Parameters[a,b]	Mean	9824480.63	9917524.60	10913714.60	10967869.59	11379957.93
	Std. Deviation	11533200.339	11492543.501	29575456.573	12841535.387	13781657.020
Most Extreme Differences	Absolute	0.226	0.223	0.365	0.210	0.208
	Positive	0.215	0.215	0.299	0.199	0.202
	Negative	-0.226	-0.223	-0.365	-0.210	-0.208
Test Statistic		0.226	0.223	0.365	0.210	0.208
Asymp. Sig. (2-tailed)		.000[d]	.000[d]	.000[d]	.000[d]	.000[d]
		Medium sized company				
		SALE 2012	**SALE 2013**	**SALE 2014**	**SALE 2015**	**SALE 2016**
N		1225	1225	1225	1225	1225
Normal Parameters[a,b]	Mean	30599739.94	31979799.41	43329916.87	40140792.68	46333426.46
	Std. Deviation	37880847.396	41905158.128	196513316.795	108900884.841	243259381.380
Most Extreme Differences	Absolute	0.223	0.236	0.416	0.363	0.427
	Positive	0.198	0.208	0.349	0.290	0.351
	Negative	-0.223	-0.236	-0.416	-0.363	-0.427
Test Statistic		0.223	0.236	0.416	0.363	0.427
Asymp. Sig. (2-tailed)		.000[d]	.000[d]	.000[d]	.000[d]	.000[d]

Note: (1) Own source based on data provided by DANE. (2) Test distribution is normal. (3). They have been calculated using the statistical software SPSS.

The result of this test clearly reflects how the asymptotic asignificance or also called p-value, is less than zero for all years and the groups of companies studied, so the null hypothesis is rejected and the alternative is validated.

Hence, each of the data behave through non-normal or non-parametric distributions.

For the analysis of this type of data and to achieve solving the proposed objective, the Mann-Whitney nonparametric test U was chosen for two independent tests. The results are presented in Table 6 for the small and medium enterprises respectively:

Tabla 6
Non-parametric Mann-Whitney U test ranges for two independent
tests. Panel 2012-2016 for small and medium enterprises.

	Year	EC	N	Average Range	Sum of ranges	U de Mann-Whitney	Z	Asymp. Sig. (2-tailed)
Small size companies	2012	Yes	412	1291,45	532076,5	446998,5	-1,737	0,082
		No	2293	1364,06	3127788,5			
	2013	Yes	482	1300,38	626782,5	510379,5	-1,632	0,103
		No	2223	1364,41	3033082,5			
	2014	Yes	564	1309,37	738486	579156	-1,491	0,136
		No	2141	1364,49	2921379			
	2015	Yes	617	1314,65	811138	620485	-1,388	0,165
		No	2088	1364,33	2848727			
	2016	Yes	624	1295,45	808360	613360	-2,099	0,036
		No	2081	1370,26	2851505			
Medium-size companies	2012	Yes	270	622,18	167988,5	126446,5	-0,483	0,629
		No	955	610,4	582936,5			
	2013	Yes	303	638,66	193513	131909	-1,455	0,146
		No	922	604,57	557412			
	2014	Yes	335	620,86	207987	146443	-0,477	0,633
		No	890	610,04	542938			
	2015	Yes	364	629,21	229031	150803	-1,042	0,297
		No	861	606,15	521894			
	2016	Yes	391	633,68	247768,5	154961,5	-1,401	0,161
		No	834	603,31	503156,5			

Nota: (1) Own source based on data provided by DANE. (2) The grouping variables correspond
to the implementation or not of electronic commerce. (3) This Table summarizes the test ranges
for the panel and business groups. (4) They have been calculated using the statistical software SPSS.

This table presents similar results for the behavior of small and medium enterprises. For the two groups studied, the statistical result shows that for all years, except 2016, for small businesses, there are no differences regarding the total sales that occur between those firms that have incorporated EC and those that do not. The amount of total sales, in a comparison of contrast of the central tendency, has a similar behavior between those who have made sales through the Web and those who have not implemented such strategy. Thus, for the periods described, it can be affirmed that no association is detected between the total sales of companies that have developed their sales through online commerce and among those who have not developed sales in this way.

However, in the only period that present a difference are for the small businesses in 2016, where referring to the average range, those who do not have online commerce, they sell more than those that have adopted it as a commercial tool.

LIMITATIONS AND FUTURE RESEARCH

One of the most important limitations in this study is based on the sample taken in the databases provided by DANE. Although it is a valuable

source, it leaves uncovered fields of electronic commerce in the country, showing only a panorama of the behavior of this topic. As future research it is convenient to know the opinion of Colombian SMEs and measure their perceptions to cover not only sales-based behavior but also the opinions of organizations and how the e-commerce adoption can be approached to use this tool as a basis for the progressive development of SMEs' and Colombian competitiveness.

CONCLUSIONS

Within a purely logical context, the relationship of electronic commerce with sales is taken as a fact. However, the statistical evidence shows that the reality in Colombian SMEs is different. When analyzing the results of the same year, it is obtained that the relationship between sales and electronic commerce becomes weak and even nil. The above can be given for several reasons. The first one has to do with the minimum use of e-commerce as a commercial strategy in Colombian SMEs. Since few companies have implemented it, in the statistical studies related to this document, the relation established is tiny on the sales made in the companies.

The second factor shows the scarce percentage represented by online sales compared to the total sales of SMEs. At the most, the percentage of electronic commerce has reached 6.73% of the company's total operating income. This figure reveals a panorama where sales developed by traditional Colombian companies with commercial activity, is tiny. However, from another point of view, it can be said that there is great potential for SMEs to involucrate within their commercial strategy processes that link online sales. Therefore, teach these companies the optimal way of their development and implementation, it is of vital importance for the economy of the country, understanding electronic commerce as a tool to improve sales and hence the competitiveness of the organization. Despite, its application will depend on the different markets in which the company develops its activity and the environment in which it performs (Zuchowski, 2016). This statement presents a reality where the different contexts must understand that the technological environment of a country and its society can create strategies to improve organizational results. For this, the managers must have the knowledge to be able for training all the stakeholders on e-commerce to enhance the competitiveness in Colombian SMEs.

In this context, managers or executive positions must be clear about the knowledge and opportunities provided by this electronic tool in order to create strategies according to the culture of the different countries. It is very important to understand each of the markets to which the product is directed, and the main customers of the company. Based on these items, the correct implementation of electronic commerce and therefore the success of this purchase and sale system will depend.

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Notes

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