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ECONOMÍA DIGITAL, TECNOLÓGICA Y SU IMPACTO EN LA INNOVACIÓN Y EL EMPRENDIMIENTO EN EL ECUADOR

DIGITAL AND TECHNOLOGICAL ECONOMY AND ITS IMPACT ON INNOVATION AND ENTREPRENEURSHIP IN ECUADOR

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RESUMEN

La economía digital es un fenómeno creciente y transformador, que abarca múltiples áreas como la macroeconomía y las tecnologías de la información y comunicación (TIC). En Ecuador, la adopción de tecnologías digitales ha generado avances significativos, aunque se enfrenta a barreras como una infraestructura digital limitada, baja inversión tecnológica y falta de capacitación en habilidades digitales. El objetivo de este estudio es analizar el impacto de la economía digital en la innovación y el emprendimiento en Ecuador, evaluando las barreras que limitan su adopción y las oportunidades que ofrece la digitalización para crear nuevos modelos de negocio y empleo. En la metodología se utilizó el método analítico-sintético, respaldado por una revisión exhaustiva de literatura mediante bases de datos como Scopus y Redalyc. Se analizaron 25 estudios relevantes, los cuales fueron seleccionados y evaluados en función de su impacto académico y relación con el tema. Los resultados muestran que la digitalización ha impulsado sectores como el comercio electrónico y los servicios financieros, permitiendo la creación de startups y nuevos modelos de negocio. Sin embargo, las pequeñas y medianas empresas (PYMES) enfrentan barreras significativas, como la falta de financiamiento y capacitación tecnológica. Estas barreras limitan su capacidad para competir en un mercado global. La infraestructura digital del país también muestra desafíos, con baja penetración de banda ancha y una inversión insuficiente en TIC. En conclusión, la economía digital tiene el potencial de transformar profundamente la innovación y el emprendimiento en Ecuador, pero su éxito depende de superar las barreras estructurales y mejorar la infraestructura tecnológica para facilitar la integración y competitividad empresarial.

Palabras clave Comercio digital, plataformas digitales, digitalización, datos informativos

ABSTRACT

The digital economy is a growing and transformative phenomenon, encompassing multiple areas such as macroeconomics and information and communication technologies (ICT). In Ecuador, the adoption of digital technologies has generated significant advances, although it faces barriers such as limited digital infrastructure, low technological investment and lack of training in digital skills. The objective of this study is to analyze the impact of the digital economy on innovation and entrepreneurship in Ecuador, evaluating the barriers that limit its adoption and the opportunities offered by digitalization to create new business and employment models. The methodology used the analytical-synthetic method, supported by an exhaustive review of literature through databases such as Scopus and Redalyc. 25 relevant studies were analyzed, which were selected and evaluated based on their academic impact and relationship with the subject. The results show that digitalization has boosted sectors such as e-commerce and financial services, allowing the creation of startups and new business models. However, small and medium-sized enterprises (SMEs) face significant barriers, such as lack of financing and technological training. These barriers limit their ability to compete in a global market. The

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country's digital infrastructure also presents challenges, with low broadband penetration and insufficient investment in ICT. In conclusion, the digital economy has the potential to profoundly transform innovation and entrepreneurship in Ecuador, but its success depends on overcoming structural barriers and improving technological infrastructure to facilitate business integration and competitiveness.

Keywords Digital commerce, digital platforms, digitalization, information data

INTRODUCTION

The digital economy is an emerging and complex phenomenon that encompasses diverse areas such as microeconomics, macroeconomics, and theories of organization and management (1). This phenomenon has acquired growing relevance due to the role played by information and communication technologies (ICT) in the transformation of economic and social processes. International organizations and experts agree that the digital economy will be one of the main drivers of economic growth in the coming decades (2) (3).

The rise of the digital economy is related to the migration of organizations and productive sectors toward a digital environment, where the widespread use of ICT becomes an essential tool for increasing competitiveness and productivity (4). This phenomenon not only transforms the way businesses are conducted, but also how people interact in an increasingly interconnected and technologically dependent society. In Ecuador, digitalization has generated advances, but it still faces important barriers that limit its full development, which raises the need to study its impact on innovation and entrepreneurship.

Despite the transformative potential of the digital economy, its adoption in Ecuador faces several challenges. These include limited digital infrastructure, lack of digital skills among the workforce, and low investment in technology and digitalization by companies. In many areas, Ecuadorian companies have not been able to fully adapt to the new demands of the digital economy, which has affected their competitiveness both locally and globally.

The impact of this transformation is profound, affecting key productive sectors such as commerce, agriculture, industry, and financial services. For example, digitalization in Ecuador has changed the way commercial transactions are carried out, with notable growth in e-commerce, but with a lack of technological integration in small and medium-sized enterprises (SMEs). Companies that fail to adapt to this digital environment are left behind, losing opportunities for growth and expansion (5).

The central problem of this research lies in the limited adoption and development of the digital economy in Ecuador and its impact on innovation and entrepreneurship. Digital gaps in the country hinder the effective integration of ICT into the business ecosystem, which reduces companies’ capacity to innovate and compete in international markets. In addition, the lack of efficient public policies that promote investment in technology and training in digital skills reinforces the stagnation of this transformation process.

The digital economy is defined as the set of strategies and actions that enable organizations to integrate ICT into their operations in order to improve their competitiveness and productivity. From a global perspective, the use of ICT has been a key driver of economic growth. In developed economies, digitalization has generated new industries, driven innovation, and enabled the creation of jobs in emerging sectors such as artificial intelligence, e-commerce, and fintech. However, in emerging economies such as Ecuador’s, digitalization has advanced at a slower pace due to structural factors that limit its implementation (5).

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At the regional level, Latin America has shown moderate advances in the adoption of the digital economy, but remains lagging behind other regions of the world. Digital gaps are significant, and insufficient technological infrastructures have prevented many economies in the region, including Ecuador's, from fully benefiting from digitalization (6). The lag in the digitalization of productive sectors, limited innovation in digital industries, and the lack of preparation of the workforce to face the challenges of the digital economy are some of the most significant barriers faced by developing countries (7).

Ecuador has attempted to improve its technological infrastructure through public policies, such as the National Digital Development Plan, which seeks to foster digital inclusion and improve ICT infrastructure. However, progress has been slow, and major challenges still persist. The digital economy in Ecuador also faces regulatory barriers that limit the development of new technological ventures and the integration of innovative business models based on ICT (8).

The present study has as its general objective to analyze the impact of the digital economy on innovation and entrepreneurship in Ecuador. This analysis will focus on identifying the barriers that limit technological adoption, as well as evaluating the opportunities offered by digitalization for the development of new business models and job creation in emerging sectors. In addition, it will evaluate the current state of digital infrastructure in Ecuador and its impact on the competitiveness of companies. It will also identify the main barriers faced by small and medium-sized enterprises (SMEs) in adopting digital technologies. Finally, it will analyze the impact of digitalization on innovation and entrepreneurship in key sectors of the Ecuadorian economy.

MATERIALS AND METHODS

The present study employed a rigorous methodological approach to analyze the impact of the digital economy on innovation and entrepreneurship in Ecuador. The analytical-synthetic method was used, which made it possible to describe and identify the main characteristics and benefits associated with the digital economy. Complementarily, an exhaustive literature review was carried out, supported by specialized tools and databases recognized in the scientific field.

To ensure the validity and relevance of the information, a systematic process of study selection was carried out using tools such as Scopus, Redalyc, and Dialnet, which are highly valued for their coverage in economic and technological sciences.

Initially, the search yielded a total of 25 relevant articles. However, to ensure that the selected documents were appropriate for the objective of the study, a careful screening of the database was performed. Articles that did not come from official secondary sources or that were not directly related to the topic under investigation were discarded.

This preliminary filtering was carried out by reading the titles and abstracts of the articles, prioritizing those that showed an h-index greater than 10, which guaranteed greater scientific relevance and a significant impact in the field of the digital economy.

Subsequently, the initial 35 articles were reduced to a more manageable set of 25 documents, organized by order of importance according to their academic impact and relevance in the context of the digital economy. This process was supported by the evaluation of the impact indexes and citations of the studies, in order to ensure that the selected articles made a significant contribution to the research.

Once the most relevant articles had been selected, a detailed review of the first 20 publications was carried out, which showed a direct alignment with the evaluation parameters established for

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the study. The review of these works was key to identifying the roles played by the digital economy in economic growth and innovation in key sectors.

The analysis of these articles was based on the inductive-deductive method, which made it possible to draw general conclusions about the impact of the digital economy on entrepreneurship and innovation. From this analysis, common patterns and trends in the selected studies were identified, which allowed the development of a comprehensive understanding of the topic and its applicability in the Ecuadorian context.

RESULTS

The relevance of the digital economy lies in its capacity to generate new economic opportunities (4). In this sense, digital data have the potential to be used in development initiatives and in the solution of social problems, even addressing those linked to the Sustainable Development Goals (SDGs) (6). Consequently, it acts as a driver of growth in terms of innovation and productivity.

In the business sphere, the digital transformation of sectors and markets can favor the production of higher-quality goods and services at lower costs (5). In the public sphere, the implementation of e-government ensures efficiency, democratization of information, and transparency (7). In addition, digitalization makes it possible to reconfigure value chains and open new channels for the creation of added value, facilitating significant structural changes.

Current state of digital infrastructure in Ecuador and its impact on the competitiveness of companies

Table 1. Digital infrastructure in Ecuador and its impact on company competitiveness

Indicator	Value	Interpretation
Internet access in urban areas (%)	75%	Despite relatively high access in urban areas, a significant gap still exists in rural areas, limiting digital reach.
Fixed broadband penetration (%)	12%	Low broadband penetration reduces companies' possibilities of adopting advanced digital technologies.
Investment in ICT infrastructure	0.7% of GDP	Investment in technological infrastructure is insufficient compared with other countries in the region, limiting sustained technological development.
Digital Readiness Index	55/100	Ecuador is at the global average, but well below the most advanced economies in terms of infrastructure and technological readiness (9).

The results show that Ecuador faces important challenges regarding digital infrastructure, particularly low fixed broadband penetration and limited investment in technology. These shortcomings prevent many companies, especially small and medium-sized enterprises (SMEs), from fully taking advantage of the opportunities of digitalization. The lack of adequate connectivity in rural areas also restricts access to the benefits of the digital economy, affecting the country's competitiveness in the global environment.

Barriers faced by SMEs in adopting digital technologies

Table 2. Barriers faced by SMEs in adopting digital technologies

Barrier	% Affected	Interpretation
Lack of financing	65%	The majority of SMEs lack the financial resources necessary to invest in technological infrastructure and training.
Low technological training	70%	A high percentage of SMEs lack personnel trained in the use of ICT, which limits the adoption and effective use of technologies (10).
Resistance to change	45%	There is significant resistance to change, especially in traditional companies that fear the risks associated with digitalization.
Lack of government support	55%	The perception of a lack of public policies that promote digitalization is a critical factor affecting SMEs in Ecuador (11).

The lack of financing and low training in digital skills are the most important barriers faced by SMEs in Ecuador. These barriers prevent small and medium-sized enterprises from taking advantage of the opportunities offered by the digital economy to innovate and improve their competitiveness. The lack of government support and resistance to change also contribute to making the adoption of digital technologies slower in this sector.

Impact of digitalization on innovation and entrepreneurship in key sectors of the Ecuadorian economy

Table 3. Impact of digitalization on innovation and entrepreneurship in key sectors of the Ecuadorian economy

Sector	Innovation	Entrepreneurship impact	Interpretation
E-commerce	50% growth in the last 3 years	Increase in the number of startups dedicated to e-commerce	Digitalization has allowed e-commerce to grow rapidly, generating new business opportunities (12).
Manufacturing industry	Implementation of automation (25%)	Creation of new SMEs dedicated to technological solutions	Although slow, the manufacturing sector is adopting automation technologies, driving technological ventures (13).
Financial services	Innovation in fintech and digital banking	New startups in digital financial services	The financial sector has been one of the most innovative in Ecuador, with the growth of fintechs and digital banking services.
Agriculture	Limited use of technology	Scarce development of digital ventures in this sector	The agricultural sector is one of the least digitalized, which limits entrepreneurship and innovation in this crucial sector (14).

The key sectors of the Ecuadorian economy are experiencing different levels of innovation and entrepreneurship as a result of digitalization. E-commerce and financial services are the most dynamic sectors, with a significant increase in the creation of digital startups. However, sectors such as manufacturing and agriculture face greater difficulties in adopting technology, which limits innovation and entrepreneurship in these areas.

Benefits of the digital economy

• It allows free access to different markets, such as education and the trade of different types of products, at more competitive prices (13).

• It offers greater flexibility for workers. In this sense, remote work allows schedules to be freely organized in order to achieve a better balance with personal life (13).

• It enables the growth of emerging businesses. The application of ICT facilitates efficient processes that, at the same time, make greater growth possible in less time. The digital economy requires less initial investment and therefore allows more capital to be allocated to improving other processes of the emerging company (16).

• It has a good capacity to adapt to changes in consumer habits. At present, consumer behavior has changed, and in all processes the digital economy shows high adaptability.

DISCUSSION

The digital economy is characterized by the digital transformation of commercial processes, production, distribution, and consumption, using digital platforms, electronic networks, and advanced digital technologies (23).

In this context, e-commerce plays a crucial role, allowing companies and consumers to carry out online transactions, eliminating geographical barriers and providing access to global markets. In addition to e-commerce, the digital economy encompasses a diversity of sectors, from online financial services and digital entertainment to the development of emerging technologies such as artificial intelligence, the Internet of Things, blockchain, and virtual reality (24).

The digital economy has given rise to the creation of new business models, driving innovation and efficiency in the production and delivery of goods and services. Digital platforms, such as mobile applications and websites, facilitate interaction between companies and consumers, creating online markets that efficiently connect sellers and buyers (25).

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CONCLUSIONS

The analysis carried out shows that the digital economy has profoundly transformed innovation and entrepreneurship in Ecuador. The adoption of digital technologies has allowed the emergence of new business models and has facilitated job creation in emerging sectors such as e-commerce and fintech. However, this transformation has not been homogeneous, since sectors such as agriculture and manufacturing have had a slower adoption of technologies.

Digitalization offers a platform for business development, but its success depends on the capacity of companies, especially SMEs, to adapt rapidly to technological changes. The obstacles these companies face, such as lack of financing, low technological capabilities, and resistance to change, limit their entry into the digital economy and their capacity to compete in the international market.

On the other hand, digital products in this country, such as broadband, are costing a great deal of money, and that money is being invested in well-known products. As a result, many organizations are forced to use online services that are affecting the company's performance in global competition.

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