

EDITORIAL

From the traditional economy to the digital economy: challenges and transformations

De la economía tradicional a la economía digital: retos y transformaciones

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Abstract

The digital economy represents a structural transformation that redefines the foundations of economic theory through the convergence of big data, artificial intelligence (AI), digital platforms, and disruptive technologies. This shift impacts production, trade, macroeconomic measurement, logistics, education, and the labor market. E-commerce is gradually displacing physical markets and poses regulatory challenges, while indicators such as GDP show limitations in capturing the value of intangible assets, data, and free digital services. Consequently, metrics such as GDP-B and the inclusion of data capital in national accounts have been proposed. Sectors like agriculture and healthcare are adopting AI and machine learning to optimize processes and reduce costs. The labor market is being reshaped by automation, remote work, and the platform economy, creating opportunities in digital jobs while also increasing risks of precarious work, which requires policies focused on training and technological reskilling. Education, in turn, must foster digital skills and critical thinking through tools like Google Colab and EdTech platforms. Reducing the digital divide, ensuring equity, and updating regulatory frameworks are key conditions for inclusive development in the digital economy of the 21st century.

Keywords: Digital economy, productivity and employment, e-commerce, public policies.

Resumen

La economía digital representa una transformación estructural que redefine los fundamentos de la teoría económica mediante la convergencia de big data, inteligencia artificial (IA), plataformas digitales y tecnologías disruptivas. Este cambio impacta en la producción, el comercio, la medición macroeconómica, la logística, la educación y el mercado laboral. El comercio electrónico desplaza gradualmente a los mercados físicos y plantea desafíos regulatorios, mientras que indicadores como el PIB muestran limitaciones para captar el valor de activos intangibles, datos y servicios digitales gratuitos. Por ello, se proponen métricas como el PIB-B y la inclusión del capital de datos en la contabilidad nacional. Sectores como agricultura y salud adoptan IA y machine learning para optimizar procesos y reducir costos. El mercado laboral se transforma con la automatización, el teletrabajo y la economía de plataformas, generando oportunidades en empleos digitales y riesgos de precarización, lo que exige políticas de capacitación y reconversión tecnológica. La educación, por su parte, debe fomentar competencias digitales y pensamiento crítico mediante herramientas como Google Colab y plataformas EdTech. Reducir la brecha tecnológica, garantizar equidad y actualizar la regulación son condiciones clave para un desarrollo inclusivo en la economía digital del siglo XXI.

Palabras clave: Economía digital, productividad y empleo, comercio electrónico, políticas públicas.

1. Challenges of the digital economy

In microeconomics, traditional markets based on perfect competition are insufficient to describe environments dominated by digital platforms that concentrate power through network externalities. Platforms such as Amazon and Alibaba employ algorithms to personalize real-time pricing, altering the rules of competition (Varian, 2019). In macroeconomics, one of the most significant challenges is the measurement of economic value. GDP, designed for the industrial economy, does not adequately capture the value generated by free digital goods or by intangible assets such as algorithms, software, and data (Brynjolfsson, Collis, & Eggers, 2019). Metrics such as GDP-B have been proposed, incorporating the welfare derived from digital services, as well as the inclusion of data capital and software in national accounts (Coyle & Mitra-Kahn, 2020). Likewise, aggregates such as consumption and investment must incorporate digital production, e-commerce, and information flows, given that they represent a growing component of global economic value (OECD, 2019).

The digitalized informal economy adds complexity to this scenario. Transactions through social networks, unregulated payments, and informal employment on digital platforms generate opportunities but also fiscal and labor risks. Governments must design policies that promote formalization without hindering innovation (UNCTAD, 2023). The labor market, in turn, faces profound transformations with the expansion of remote work, the platform economy, and the automation of production processes. While opportunities are being created for specialized digital jobs, there is also a growing risk of precarious work and the substitution of routine tasks by technology, which demands policies focused on training and labor reconversion. At the sectoral level, the transformation is evident with the incorporation of digital technologies that optimize logistics processes, reduce costs, and improve traceability, driving efficiency and sustainability in supply chains.

In agriculture, the use of AI and satellite analysis makes it possible to optimize irrigation, predict pests, and increase productivity in strategic crops, particularly in Andean regions where sustainability is a priority (OECD, 2019). In healthcare, predictive models based on big data make it possible to identify risks of chronic diseases and design personalized treatments, improving the efficiency of public spending (Brynjolfsson & McAfee, 2014). Finally, in education, digitalization demands a profound transformation. The traditional model centered on memorization is being replaced by methodologies that develop technological skills and critical thinking (Goldin & Katz, 2008). EdTech platforms such as Coursera and Khan Academy democratize access to knowledge, while environments such as Google Colab allow for the practical teaching of econometrics and machine learning. However, the digital divide and the lack of teacher training represent barriers that require inclusive policies and strategic funding.

2. Conclusions

The digital economy is redefining microeconomic and macroeconomic theory, incorporating dynamics based on data, algorithms, and automation. In microeconomics, markets dominated by digital platforms are emerging, with network externalities and pricing algorithms, challenging the model of perfect competition. At the macroeconomic level, new metrics such as GDP-B and the inclusion of data capital are required to reflect the value of intangible assets and digital services. In econometrics, the use of big data and advanced models (nonlinear and machine learning) allows for the analysis of complex patterns of consumption, e-commerce, and employment, overcoming the limitations of traditional methods. The labor market is being transformed by the expansion of remote work, the platform economy, and automation, generating both opportunities in digital jobs and risks of precarious employment. Reducing the digital divide and strengthening education in digital and analytical skills is key to ensuring an inclusive transition to the digital economy.

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