Innovation and Technology Management: A Major Pending Issue for the Development of Latin America and the Caribbean—Some Ideas for Research

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Abstract

The 2025 Nobel Prize in Economic Sciences emphasizes the importance of innovation and technology management for a country's economic growth. However, Latin America and the Caribbean show low and uneven levels of innovation based on the Global Innovation Index (GII). Innovation and technological development can help address the region's major challenges, such as sustainable development, climate change, and the integration of new technologies like artificial intelligence and robotics. This situation prompts us to propose research ideas to develop policies and programs that boost innovation in this region.

Keywords: innovation, technology management, Nobel Prize, Global Innovation Index, Latin America and the Caribbean, research agenda.

Introducción

In October 2025, we received exciting news for the field of technology management and innovation: the Nobel Prize in Economic Sciences was awarded to researchers "for having explained innovation-driven economic growth," with one half going to Joel Mokyr "for having identified the prerequisites for sustained growth through technological progress," and the other half jointly awarded to Philippe Aghion and Peter Howitt "for the theory of sustained growth through creative destruction."[1]

This award is highly valuable for the discussion on the development of our society, because it positions innovation as a key driver of economic development. First, Joel Mokyr highlights innovation as the engine of prosperity; specifically, he points out that technological changes over the last two centuries have enabled sustained economic growth, thereby improving people's quality of life. This has not always been the case throughout history, because although technologies replaced older ones and improved the quality of life, they often stabilized. For their part, Philippe Aghion and Peter Howitt examined how innovation and technological changes drive sustained growth. Specifically, they formalized the concept of destructive creation: when a new and better product enters the market (creation), companies that sell older products suffer (destruction). Clearly, the message is straightforward and has broad implications across various fields, including politics, economics, business, and society: innovation is a vital driver of a country's development, and therefore, its promotion and support should be ongoing and amplified.

In the context of reevaluating innovation as a driver of economic growth, the Journal of Technology Management and Innovation asks: What is the level of innovation in less developed and emerging economies, such as those in Latin America and the Caribbean? What could be some research ideas to contribute to promoting and developing innovation in Latin America and the Caribbean?

Regarding the level of innovation in Latin America and the Caribbean, according to the Global Innovation Index (GII), it should first be noted that this region has made some specific, scattered progress, alongside a more widespread lag that has become evident over time. Moreover, in the 2025 ranking, only two countries are close to the top 50, with Chile leading the region at 51st place, followed by Brazil (52), Mexico (58), Uruguay (68), and Colombia (71). Meanwhile, countries like Ecuador (113), Honduras (119), Guatemala (123), Nicaragua (130), and Venezuela (136) rank lower (WIPO, 2025).

To examine the innovation landscape in Latin American and Caribbean countries in greater detail, we turn to the pillars of the Global Innovation Index (Table 1). First, regarding the "institutional pillar," which measures political stability, regulatory quality, and government effectiveness, these are essential factors for fostering an environment conducive to innovation. In the region, we observe heterogeneity, and this pillar is among the weakest. In fact, its institutional ranking is often lower than its GII ranking, with Brazil (107), Mexico (104), and Argentina (120) standing out. Overall, the region has an institutional gap that limits its innovative potential. Without stable regulatory frameworks, low corruption and informality, and predictable policies, it is hard to attract investment, promote public-private cooperation, or develop strong innovation ecosystems (Alatrista, 2022; Díaz-Pérez & Arechavala-Vargas, 2008; Heredia et al., 2017).

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Table 1. Pillars of Global Innovation Index (2025).

Economy	Overall GII	Institutions	Human capital and research	Infrastructure	Market sophistication	Business sophistication	Knowledge and technology outputs	Creative outputs
Chile	51	50	56	49	37	54	63	65
Brazil	52	107	48	60	71	39	50	50
Mexico	58	104	67	77	68	72	54	49
Uruguay	68	31	93	46	103	115	73	81
Colombia	71	86	62	74	75	60	78	72
Costa Rica	72	57	85	63	89	70	55	88
Argentina	77	120	57	80	100	81	79	59
Peru	80	93	42	68	51	120	95	79
Panama	82	84	110	48	91	132	90	68
Jamaica	83	64	100	102	115	101	117	51
Barbados	84	56	89	121	127	51	61	90
Dominican Republic	97	54	111	81	112	87	113	97
El Salvador	98	92	122	113	87	122	104	73
Paraguay	103	94	119	58	111	104	122	93
Bolivia	111	134	41	124	40	106	126	106
Ecuador	113	117	96	86	113	109	94	110
Trinidad and Tobago	114	80	74	110	98	135	121	127
Honduras	119	130	113	107	94	126	96	122
Guatemala	123	112	134	117	99	118	114	119
Nicaragua	130	135	129	118	92	67	115	135
Venezuela	136	139	25	138	135	105	137	115

The "human capital and research pillar" assesses educational quality, investment in higher education, and R&D efforts, which determine a country's capacity to generate knowledge and transform it into innovation. The results show that Latin America and the Caribbean still lag significantly behind developed economies. In addition, Table 1 shows that some of the highest-ranked countries in the GII are decreasing in this dimension, including Chile, Brazil, Colombia, and Peru. The region must strengthen its educational and scientific ecosystem by promoting collaboration among universities, businesses, and governments and by ensuring that human talent drives innovation, particularly in new technologies such as artificial intelligence and robotics (Heredia et al., 2022; Mikhailov et al., 2024).

The infrastructure pillar evaluates the technological, logistical, and energy environments that support innovation, including digital connectivity, access to information technologies, green infrastructure, and sustainability. In Latin America, this pillar highlights one of the most significant structural challenges to the development of knowledge-based economies. The region should prioritize smart, sustainable infrastructure that connects innovation to the digital and ecological transition. Investing in connectivity, logistics, digital technologies, and clean energy not only enhances competitiveness but also promotes knowledge sharing and collaboration among actors in the innovation ecosystem (Ferrer, 2009; Castillo-Vergara et al., 2025).

The "pillar of market sophistication" and the "pillar of business sophistication" bridge structural capabilities and value creation through innovation. They show heterogeneity and low rankings in general, especially in countries as Paraguay, Ecuador, and Guatemala (Table 1). The first measures access to credit, capital investment, and ease of doing business; the second measures companies' ability to absorb knowledge, forge links with universities, and adopt innovative practices. Both are essential for transforming knowledge into economic development. Together, these two pillars reveal that the region needs a more ambitious, productive transformation agenda that combines macroeconomic stability with real incentives for innovation. Market

and business sophistication is the link that connects science with competitiveness and access to financial support; without strengthening it, Latin America's innovative potential will remain limited to isolated efforts, failing to scale up to the systemic level required for sustainable development (Heredia et al., 2019; Tamayo-Galarza et al., 2025).

The pillar of "creative outputs" reflects the tangible results of innovation efforts: scientific output, intellectual property, technological creation, and knowledge dissemination. In short, it is the indicator that translates investment in innovation into concrete results for the economy and society. In Latin America and the Caribbean, creative outputs are declining in countries with the highest GII rankings (Table 1). These results are supported by the fact that the number of patents originating in the region remains almost unchanged between 2015 (7,500) and 2023 (7,320), with a peak of 8,610 in 2016, accounting for nearly 2% of the global total[2].

Although there are different theoretical and practical approaches to identifying new research and development challenges to promote and strengthen innovation in Latin America and the Caribbean, the Global Innovation Index analysis allows us to focus on those areas where the region needs to improve. However, it is necessary to consider that solutions must not only account for the diversity of countries with different institutional, educational, business, and social developments, but also for the diversity within countries themselves, across different territories and industrial sectors.

Some ideas for future research to promote innovation in America Latina and the Caribbean

Examining the background of the pillars of innovation based on the Global Innovation Index raises important research questions. These questions could focus on assessing the benefits of policies and programs aimed at strengthening each pillar, such as institutions, human capital and research, infrastructure, market and business sophistication, knowledge products, and technologies. However, it is necessary to address why these pillars have not been more fully developed in the region as well.

In addition, it is important to examine the own characteristics in our region that influence innovation, such as informality, corruption, weak institutions, and low levels of interorganizational cooperation. Furthermore, in this same vein, it is important to understand how these and other factors specific to each country and region are consistent with the different theoretical approaches used to analyze innovation, which often form the theoretical basis for developing public policies and programs, such as national and regional innovation systems, clusters, triple helix, and innovation ecosystems.

Questions also arise about how new technologies such as artificial intelligence, digitization, robotics, nanotechnology, and personalized medicine can drive innovation to help us address major regional challenges, such as competitiveness, sustainable and inclusive development, climate change, natural resource exploitation, and poverty.

At the organizational level, questions also arise about how to promote innovation and innovative entrepreneurship in companies, especially within Latin America and the Caribbean.

In fact, companies and organizations are the primary drivers of innovation. They need access to financing, collaboration with other agents, the development of flexible and adaptable resources and capabilities, and effective innovation and technology management.

Undoubtedly, there are many ideas for research and generating new technological developments. For this reason, we do not expect this to be an exhaustive list, but rather one that contributes to the debate on generating research. Perhaps the most important challenge is to create a regional culture that values innovation and all the agents and individuals behind it, as actors who contribute to the development of developing and emerging economies such as those in Latin America and the Caribbean. In fact, we believe that the 2025 Nobel Prize in Economic Sciences inspires us to take a fresh look at our own development: if innovation is the engine of sustained growth, then investing in research, development, and innovation (R+D+I) is not just an option, but an essential strategy for the well-being and competitiveness of the region. It challenges us at the Journal of Technology Management and Innovation to remain part of this by continuing to publish high-level research.

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[2] WIPO - World Intellectual Property Organization

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