

## ORIGINAL ARTICLE

# Techno-Feudalism and Socioeconomic Transformation: Implications for Latin America and Other Countries.

## Tecnofeudalismo y transformación socioeconómica: implicancias para América Latina y otros países

María de las Nieves Navarro-Mozo\*

Universidad Europea Miguel de Cervantes, España; ORCID: 0000-0002-4635-2584

\*Correspondence to email: [nnavarro@uemc.es](mailto:nnavarro@uemc.es)

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### Abstract

This article addresses the significance of technological development and Artificial Intelligence (AI) for humanity, and its importance in macroeconomic areas such as industry and financial matters, as well as in everyday life. This is done by considering the positions of experts such as Sam Altman and Mike Zuckerberg. The aim is to highlight this emerging reality, which is here to stay and brings contributions with positive implications that, currently, are dominated by a few nations, leaving room for improvement in other countries so that they can join these advancements in the future. A qualitative methodology is used, based on the use of materials such as a review of books, scientific and opinion articles, and data from organizations such as the World Economic Forum and ECLAC. The results reveal exponential advances in the aforementioned areas and in others such as education. However, as with almost everything, there is a negative side, such as the existing gaps in the area of security, which truly entails dangerous consequences at both the individual and geopolitical levels. It is concluded that these technologies, however much they achieve, need to overcome structural, regulatory, and other challenges.

**Keywords:** Artificial intelligence, technofeudalism, technology, development, leadership, teaching.

**JEL Classification:** O33; D40; P10.

### Resumen

Este artículo se ocupa de la trascendencia del desarrollo tecnológico e Inteligencia Artificial (en adelante IA) para la humanidad, y su importancia en áreas macroeconómicas como la industria o las cuestiones económico-financieras así como en la vida ordinaria, y esto se hace considerando posicionamientos de expertos como Sam Altman o Maik Zuckererger. El objetivo del mismo es dar a conocer esta incipiente realidad que ha venido para quedarse y que conlleva aportaciones con implicaciones positivas que hoy por hoy unas pocas naciones acaparan, dejando patente espacios de mejora en otros países para que en un futuro puedan unirse a estos progresos. Para ello se utiliza una metodología cualitativa, basada en el uso de materiales tales como el examen documental de libros, artículos científicos y de opinión, o de datos de organismos como el Foro Económico Mundial o el CEPAL. Los resultados descubren avances exponenciales en materias antes nombradas o en otras como educación, pero como casi todo tiene una parte negativa, tal es el caso de las lagunas existentes en el área de la seguridad, algo que verdaderamente entraña consecuencias peligrosas a nivel individual y geopolítico. Se concluye que estas tecnologías, por más que obtengan logros, requieren alcanzar desafíos

estructurales, normativos, y otros.

**Palabras clave:** Inteligencia artificial, tecnofeudalismo, tecnología, desarrollo, liderar, enseñanza.

**Clasificación JEL:** O33; D40; P10.

## 1. Introduction

AI affects numerous areas of life, including teaching and learning processes, which can be positive for the professional lives of university students (Martínez-Rivera, 2024, 1–17; Sánchez-Bayón et al, 2024, 2025 and 2026). However, there are skeptical opinions regarding research using tools like chatGPT, which eliminates the need to read books or scientific articles (Agudelo, 2022, 7–17). It has also created problems in assessment methods, leading to measures such as subjecting<sup>1</sup> students to multiple-choice exams. But while we try to prevent the overuse of AI, critical thinking skills are being lost in Generation Z. And what about Generation X, which came before? Is it a lost generation in terms of what these technological advances mean?

We are experiencing a sociological and anthropological revolution (Valero and Sánchez-Bayón, 2018), which, together with the technological revolution, leads us to define what intelligence is. If AI can reach complex reasoning while people are required to give binary answers, as discussed above, this could cause the human species to regress. Therefore, if we use this technology to make our lives easier, it is a positive thing (Sánchez-Bayón, 2019, 2020 and 2021), but if these techniques are also endowed with a kind of human dignity, it becomes negative, and we would arrive at the question of whether this AI is a subject of rights, which would lead us to consider whether what is sought is an *ambitiopecuniae* or an *ambitiodignitatis* (Sánchez-Bayón, 2010, 2013 and 2022). Following Maslow's pyramid approach, one would have to question whether the needs for self-actualization might not be in conflict with the needs for recognition.

It should be noted that robotics for household tasks is included within AI, representing a significant improvement in the quality of life for many people. It is also worth mentioning the quantum computer, which outperforms traditional computers and allows for very rapid calculations, which, combined with AI, leads to a powerful symbiosis (Parada, 2024).

There is no doubt that, from an educational perspective, generative AI and chatGPT (Rouhiainen, 2024, 20–100) level the playing field, as it makes it difficult to distinguish those who strive for excellence from those who merely use this technique. Ultimately, the focus is on utility and speed, but the process is forgotten, leading to the question: where is this utilitarianism leading us? Generative AI can create content from the data it has been trained on, potentially raising doubts about the authenticity of the generated material (IONOS Editorial Team, 2025). Questions also arise as to whether generative AI represents technological determinism, given that these new devices emerge autonomously from society, or whether it is a social construct resulting from the pressure exerted by certain social actors (Lópezdel Castillo, 2024, 1–23).

It is difficult to address the issue of AI without mentioning Alan Turing, considered the father of AI. This English mathematician, in the first half of the 20th century, conceived of a machine with stored memory and the so-called Turing test, an ability test that demonstrates human-like behavior. In this century, Sam Altman—CEO of OpenAI—reflects on AI and, challenging any futuristic fantasies, predicts that this technology will eventually surpass humans in capabilities, that is, superintelligence. However, he also warns of potential ethical and security challenges (Jackson, 2025; Cuadros, 2024; Sánchez-Bayón et al., 2025).

We seem to be headed towards a new AI economy; it is the emergence of a new era. If we look back to other times, e.g., in the Middle Ages there was the relationship of man with God with a theocentric conception of life, while in the Renaissance anthropocentrism prevailed where the person was the center, but at this time that place has been taken over by money and time.

1. Verbi gratia or v.gr. ∴ Latin phrase meaning for example.

On another note, the question remains which country is leading technological development, with doubts surrounding whether it's the US or China, although some believe China is winning the race. Indeed, upon closer examination, the US has a deeply mercantilist profile, characterized by monopolies like Google and Microsoft, which inevitably leads to a slowdown in technological progress.

In light of this introduction, there are several fronts that can be addressed, and to focus on one of them, it is worth stating that the objective of this study is to address technofeudalism, its conceptualization, its geographical dimension, and its effectiveness as a new world order, which, given the novelty of the subject, adds relevance to its still developing knowledge.

Regarding the structure of this article, it is divided into sections that provide organization to the analysis, primarily following a qualitative methodology of reviewing sources, materials, and versions that justify the relevance of this study. The results obtained will then be presented, followed by a discussion phase that substantiates the findings. Finally, the conclusions will summarize the research and offer recommendations based on the foregoing.

## 2. Literature review

Despite the exposure *ab initio* (Sánchez-Bayón, 2025), there are organizations such as the World Economic Forum, which advocates as professions of the future in the short-medium term those of the agricultural sector, laborers, delivery drivers, van drivers or construction employees (Banking and Business, 2025).

figure in technology, has become a large landowner (Acebal, 2021), believing in climate change as he refers to it in "My Green Manifesto" (XL Semanal, 2021), and he also identifies four dangers that threaten humanity, one of which is the aforementioned climate change, and the other three are bioterrorism, unregulated AI (since it will sideline humans in fields as important as work, education and medicine, although he also values it for solving many problems), and the prevailing political and social polarization (Perfil, 2025).

In the US, the technological mecca is Silicon Valley, home to companies like Apple, Netflix, Facebook/Meta, Google, and Microsoft, where a similar ideology and power circles are shared. This conglomerate can be said to have originated with William Shockley and David Packard, who, somewhat influenced by Stanford University professor Frederick Terman, started Hewlett-Packard (HP). Everett M. Rogers et al.'s description of this in their book, *\*Silicon Valley Fever\**, is particularly interesting.

Returning to the US vs. China duality, in the latter case, there are programmatic results, but from a humanistic perspective, the cost-benefit analysis must also be considered. However, if we limit ourselves to technological products, we must also consider the population of each country: 1.4 billion in China versus approximately 350 million in the US. Therefore, with a marginal adjustment, one might conclude that the US leads this competition. Nevertheless, opinions are divided on this point. While some believe that the Asian country leads due to its creativity, others interpret China as simply replicating what it learns and then copies from the US, and that even with numerous patents, this could hinder its open-source creativity (Bustelo, 2025; Vidal & Tuset, 2024; Dans, 2024).

Although Big Tech<sup>2</sup> isn't intimidated by China's DeepSeek<sup>3</sup>, the latter could still pose a challenge. In fact, early 2025 saw a major upheaval in Silicon Valley when the Asian giant released an AI model that could compete with the most advanced American technology, DeepSeek. DeepSeek was cheaper, open-source, and delivered equal or better results, leading to stock market crashes and financial losses for several companies, including venture capital firms like Sand Hill Road<sup>4</sup>. Faced with this threat, Mike Zuckerberg, head of META, is trying to stay ahead by acting as a true headhunter, while Sam Altman has launched the improved ChatGPT Agent. Although this DeepSeek is similar to generative AI tools, capable of interacting in a way similar to humans, and which are tools developed in the US

2. Bigtech refers to the large American technology companies, namely Apple, Microsoft, Amazon, Facebook, and Google.

3. Deepseek is an open-source, AI-powered search platform, and therefore users can perform keyword searches, but with better results than other search engines.

4. Sand Hill Road is a road in western Silicon Valley.

such as OpenAI's ChatGPT, Anthropic's Claude, Microsoft's Copilot, Google's Gemini, or Meta's Llama, this Chinese DeepSeek does not inspire confidence in Europe for two reasons: security, as it lacks real-time controls over its responses, which could generate erroneous content; and data storage, since, being a Chinese company, it is subject to different legislation, and confidentiality is allegedly not guaranteed with this chatbot.

It should be added that at a Google event, where Sergei Brin, co-founder of Google, and Demis Hassabis, CEO of Google DeepMind, were present, the former expressed his desire for Google to create the world's first AGI before the year 2030<sup>5</sup> (Morales, 2025).

Back at the World Economic Forum in Davos in 2025, the topic of AI and its impact on the economy was discussed, along with potential risks, such as cybersecurity risks if it is not used responsibly, and the need to ensure that this technological tool does not contribute to inequality. However, this economic framework also views AI as the engine of the economy and society, creating thousands of jobs (Marr, 2025).

In light of this, this new era marked by technofeudalism brings together large companies, making them elements of *de facto* power, influencing economic policies while monopolizing data globally, and it only raises the question of how this new reality influences Latin American countries.

Before continuing with this topic, it is necessary to contextualize and define what is meant by technofeudalism as a new, emerging form of humanity, before delving into this complex issue. As FernándezPrados explains, referring to the approach taken by economist Yanis Varoufakis, it is a system that silently occupies the space formerly held by capitalism, consisting of a series of digital fiefdoms controlled by powerful technology corporations. It also includes the struggle between the US and China to secure the top spot in the global arena (Fernández, 2024). Technofeudalism is yet another economic theory that replaces ownership-based capitalism with a technocapitalism based on the control of digital and data technology. This control is concentrated in the hands of oligarchs who own the most cutting-edge and expansionist digital companies, revealing a reality that not so long ago might have seemed dystopian.

This new situation of digital change, which leaves no corner of the globe indifferent, obviously includes the countries of Latin America, where, due to social idiosyncrasies, structural differences, and the depressive economic situation, it has a special impact on the vast majority.

The consequences of digital platform capitalism affect consumption, as well as work and working conditions (Mora-Salas et al., 2024, 1-17). Regarding employment, if we consider a future scenario with universal basic income (UBI), advocated by some political ideologies, which aims for the elusive goal of social justice, it would lead to a reduction in poverty. However, conversely, it could also mean a reduction in the demand for employment, as basic needs would be met (BarraguéetMartínez, 2017, 159-183). Following this imaginative line of reasoning, UBI combined with cutting-edge technology would represent a turning point in work and the economy—for better or for worse? As with everything, it would likely elicit opposing views. Looking back at economic history, during the second industrial revolution towards the end of the 19th and beginning of the 20th centuries... In the 20th century, there was a recession in the primary sector and a boost in transport and energy systems such as gas or oil (Sánchez-Bayón, 2019 and 2020); currently with these technological advances, the so-called quaternary sector has a long way to go, in that process maximum digitalization could be sought, the Australian case serves as an example where a field such as mining, which *a priori* seems anchored in exploitation and development systems of the past, however, it is already possible to talk about mining 4.0, which includes maximum technology such as AI providing safety and efficiency (Gorroño, 2021).

In relation to the above, not all estimates point in the same direction. Some believe that this technological upheaval will lead to job losses, although new jobs with different profiles will be created, as has happened in past revolutions. The question here is whether the population will be able to retrain as quickly as these technological advances. Then there is a somewhat apocalyptic view that focuses solely on the negative aspects, such as job losses, and considers the aforementioned universal basic

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5. AGI is an advance in AI, as its purpose is to equal human intelligence.

income the only solution to prevent citizen uprisings.

In this digitized world and in the face of these techno-feudal lords, in Latin American countries with the fragile economy that sustains them in quantitative terms and in general, in order not to be definitively left behind in new technologies, the approach is to practice a competitive market economy with minimal state intervention as advocated by the Chicago School (Azpurúa, 2005, 25-35), or to follow the guidelines of the Cambridge School giving the state a primary role in correcting possible deviations and thus ensuring economic efficiency (Rabasa, 2011, 157-180).

Given the birth, institutionalization, and advancement of digital technology, regulations of all kinds and their updating are urgently needed. Specifically, with the dependence on US platforms, it is necessary to gain ground and implement actions that advocate for computational autonomy with watertight regulations, which will presumably benefit Latin American countries.

The following graphs illustrate which elements make these countries uniquely affected in this techno-feudal stage where the use of ICTs (Information and Communication Technologies) is a reality, in what aspects of life this new era has an impact, and what opportunities Latin America has in this scenario:

**Table 1. Countries affected by the techno-feudal stage**

| <b>Factors that may make Latin America weak in the face of technofeudalism.</b>                                                                                             | <b>Consequences of digital platform capitalism in Latin America.</b>                                                                                                                | <b>Does digitization help Latin America?</b>                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| There are social and economic differences, which cause certain sectors of society (individuals with few resources and/or small businesses) to suffer from low connectivity. | Exclusivity of digital power in a closed list of external companies is equivalent to concentrating wealth in foreign capital without necessarily bringing internal economic growth. | The emergence of these technologies brings with it a wide range of threats and weaknesses that must be addressed, but it also highlights a country's strengths and opportunities for improvement (SWOT Analysis). |
| The Economic Commission for Latin America and the Caribbean speaks of an internal digital divide (ECLAC, 2022) and of boosting systemic competitiveness.                    | The era of online news brings with it disinformation and information manipulation, although this aspect is not exclusive to Latin America.                                          | In the face of imperialism in terms of digital platforms, there is the unity of Latin American countries that should agree on economic strategies.                                                                |
| Latin America is also dependent on digital platforms for employment.                                                                                                        | In the labor market, new jobs are created, which does not mean stability or solidity in their performance.                                                                          | Time to educate inclusively in digital skills and the proper use of ICTs.                                                                                                                                         |
| Large corporations dominate the cyber market.                                                                                                                               | Digitalization brings with it a new kind of crime.                                                                                                                                  | Regulatory approval that guarantees proper digital use.                                                                                                                                                           |

Source: own elaboration

Another issue directly related to digitalization is CBDCs (Central Bank Digital Currencies), or central bank digital currencies. These are currencies that a country's central bank can issue to facilitate commercial transactions. Following suggestions from the Bank for International Settlements, some Latin American central banks are developing their own CBDCs to create a payment system for their citizens to use instead of cash or cryptocurrencies. It appears that this project is still in its preliminary stages, and if we look at specific countries, Brazil and Uruguay are leading the way (Mata et Castillo, 2025, 1-11). This brings us closer to a gamified world following Chinese standards, as China offers added services through its payment platforms. For example, the Alipay mobile payment system, commonly used there, provides added gamified features (Villén, 2020, 133-156). But this, which might seem agile and with certain doses of fun, raises doubts about whether its practicality would not be free of complementary problems or of a rigid state control, and in this line of argument it could be referenced that Marx & Engels in their Communist Manifesto of the mid-19th century proclaimed, which was the abolition of private property and the centralization of the means of production in the state (Marx et Engels, 2018).

The development of the technologies we are discussing involves a massive financial investment and a great deal of talent (Sánchez-Bayón et al., 2024), making it a paradigm in which centralization, *a priori*, has more room than decentralization. This contrasts with the approach advocated by the School of Salamanca (Sánchez-Bayón, 2022 and 2024), which envisioned a global society acting collaboratively even if its leaders did not share this attitude. In an ideal world, it would be beneficial to forge alliances between the two technological giants, the US and China. However, given the characteristics that define the Asian nation, this seems unlikely. Nevertheless, in truth, if these countries, which hold this license to operate with impunity, were to create a freer market, devoid of ideologies, it would help prevent its stifling.

In this scenario, the European continent cannot be ignored. The outlook is that the old continent, with its hyper-regulatory, protectionist vision of free competition and its burden of bureaucracy, finds itself in a complicated position. Europe comprises a group of developed countries that, on the one hand, should not lag behind the major technological powers, but on the other, are determined to safeguard their citizens from the adverse consequences of any monopoly. Furthermore, the European Union (EU) occupies a dominant position in the global economy, but militarily it does not hold a preponderant position. This is compounded by its role as a continent that guarantees rights. This combination of factors has left the EU reeling; it is, in a sense, already late to join the exclusive club of techno-fiefdoms. Despite this, although a position of subservience to the new technological leaders is now apparent, this does not mean it should surrender (Pérez, 2025). In the results and discussion section, a brief reference will be made to other countries such as Germany, the United Kingdom, France, and some others that stand out in certain elements of AI, according to a ranking by the Stanford University AI Institute.

### 3. Materials and methods

This research was conducted using a primarily qualitative methodology, focusing on technofeudalism and its global impact. The study specifically examines its relation to Latin America and adopts a cross-disciplinary approach, given the diverse aspects of technology and digital development. It addresses the monopoly held by two superpowers, the US and China, which have dominated the technological engineering that has shaped global economies and daily life for years. This research highlights the following:

The considerations provided by international organizations such as the World Economic Forum.

Key to its development were the beginnings of Silicon Valley, home to the world's largest technology corporations as well as other emerging companies, and the role played in it by Shockley & Packard.

The impact of China's transformative Deep-Seek is discussed, which has taken a further step in what AI means.

The arguments of figures with significant influence in the global economy and technology, such as Bill Gates, Zuckerberg, and Altman, are specified; they represent the Western world in technology versus the Eastern world, with China at the forefront, and they do not want to be left behind in this struggle.

The perspective of economist YanisVaroufakis on this techno-feudal political and economic process is presented. The revolutionary Marxist ideology is also clearly laid out on the economic front, and the positions of the Chicago School versus the Cambridge School, as well as the arguments of the School of Salamanca, are discussed.

Within the deterministic idea of what AI means for society, there is AGI and Hassabis' description of it as a dominant model.

It has been shown that it could hit the bullseye in the labor field regarding the perhaps predictable destruction of jobs, and without it being entirely appropriate to say whether some roles will be able to be replaced by others or not with the necessary speed.

Reference is made to the controversial and widely criticized UBI linked to a fully technological reality.

The issue of digital currencies is brought to light, as could not be otherwise.

For all of the above, a literature review has been conducted based on academic articles, bibliography, and specialized news.

#### 4. Results and discussion

The evaluation of results begins with an objective interpretation, based on data from neutral sources, or from sources that, even though they may suffer from some bias, are counterbalanced because they are diverse on both sides, as is the case with those who advocate that China is leading technological advancement or those who understand that it is the US.

To discuss the problem of Latin American underdevelopment, among other countries, various disparate economic theories are used, championed by the Chicago School or the Cambridge School. Different historical periods or other economic models are brought up to compare them with technofeudalism, such as the Middle Ages, the Renaissance, or capitalism.

Technofeudalism is based on elements that occur in the two major technology companies and that do not occur in the rest of the nations, and to demonstrate this, information is taken into consideration from primary sources such as news from the World Economic Forum or from CEOs and creators of technology companies, and from secondary sources such as studies by seasoned economists or professional technicians.

AI is generating concern, and prominent figures like Geoffrey Hinton, Nobel laureate in Physics, believe that society is not prepared for the risks of AI's advancement and highlight the need for appropriate governance. The reasons for these concerns, as well as its advantages, are numerous and are outlined below (Agel, N. and PratPubill Q., 2024):

Benefits include: biomedical advantages, detection of financial fraud, in logistics planning, and as virtual assistants.

And as dangers: algorithmic biases, extinction of humanity, uncontrollable technology, speed in its advance (which requires a time lag), security and privacy problems, gaps in terms of responsibilities, insufficient regulation.

Given the acceleration of the two technological giants—the US and China—to lead the technological race, it remains to be seen which of them will ultimately claim the top spot. There are reasons to support one or the other, but there are also characteristics of other countries, even those not directly involved in the race, that place them among the top ten states in AI according to a 2024 ranking by the Stanford University AI Institute. The following charts illustrate all of this:

A significant part of the analysis focuses on Latin America. As mentioned above, the reasons for the pressing problems facing the region regarding AI have been outlined. While it is possible to assess which countries are experiencing the greatest growth in this technology and the reasons behind it, the following data, based on the results of the 2024 Latin American Artificial Intelligence Index presented by the Chilean National Center for Artificial Intelligence and the Economic Commission for Latin America and the Caribbean, is presented below. The most prominent countries are listed below:

The graph shows Chile as the leader with 73.07 points out of 100, and measures both the level of preparedness and areas for improvement, so that:

Other countries that stand out in AI in the Latin American environment are Costa Rica, Panama and the Dominican Republic, but without reaching the status in the region of the six states discussed above.

It is clear how new technologies with AI have been the object of analysis, maintaining an upward evolution, and it is not yet known how far its use can go, although what can be affirmed is the speed in its trajectory (Arocena and Sansone, 2022, 301–326).

Two countries make up this reign, the US and China, although due to biases that could affect the assessments, there are doubts about which one occupies the first position.

Numerous factors underpin the content of technological and AI advances, and can be grouped into:

This matter must be given legal coverage, without forgetting ethics, with rules that guarantee legal certainty.

Table 2. States that excel in AI. Ranking by the Stanford University AI Institute

| Reasons why the US leads in AI                                                                                                                  | Reasons behind the rise of AI in China                                                    | United Kingdom                                  | India                                                                                        | United Arab Emirates                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| It leads quality research with private equity investments.                                                                                      | He stands out in academic publications, in specialized journals.                          | It is an example in terms of AI research.       | A country with great emerging potential in AI, it has academic publications on this subject. | It stands out for its inclusive idea of AI in terms of gender equality in the labor market . |
| He is at the forefront of creating outstanding machine learning models. He has made significant contributions to patents.                       | It excels in AI patents.                                                                  | He excels in private research in AI.            |                                                                                              |                                                                                              |
| It has institutions like Stanford and MIT and companies like OpenAI and Google that reaffirm this country as the world's hub for AI innovation. | It stands out in AI research, with significant government support.                        | He has spear-headed initiatives in AI security. |                                                                                              |                                                                                              |
| It stands out for hiring specialized talent.                                                                                                    | However, its biggest challenge compared to the US lies in its lack of private investment. |                                                 |                                                                                              |                                                                                              |

Source: Information extracted from De María, S. (2024), United States leads the world in Artificial Intelligence development: which countries make up the top 10, infobae. The charts are original.

Research must be conducted using scientific publications that bring the new challenges closer to the public and allow for a better understanding of the subject.

Investment is needed in specialized human talent.

AI should be pragmatic and applied to sectors such as health, as it is a tool that faces complex global challenges by analyzing large amounts of data in real time (Castaño, 2025, 1-12), financial services, manufacturing industry, agriculture.

We must encourage the granting of patents.

The presence of solid infrastructure is important.

Importance of investing private capital.

Need for government support.

A national strategy is needed.

Structural deficiencies must be addressed, as is the case in Latin America where the transformation that AI is causing is clear, although there are limiting elements for its full development, among others already mentioned (Jung et Katz, 2025, 1-47).

These circumstances concern the countries vying for leadership, and highlight the strengths of other countries that are lagging behind, and testify to the challenges that all of them should overcome.

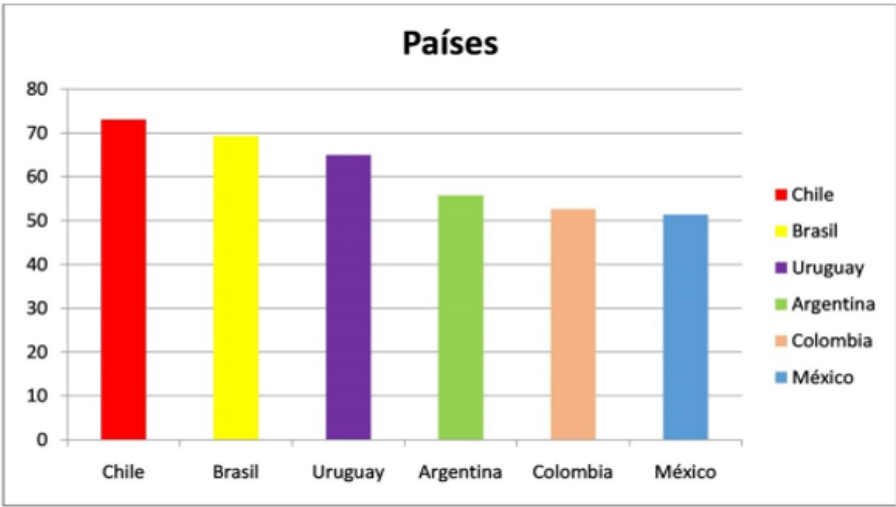
The limitations of this study are a consequence of the fact that we are dealing with an embryonic topic that has a long way to go.

Table 3. States that excel in AI. Ranking by the Stanford University AI Institute (Continued from Table 2)

| South Korea                                                   | Germany                                                                                           | Japan                                                   | Singapore                                                                                                                      | France                                                                                                                                                                                                |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| It highlights the implementation of AI as a national strategy | A leading country in the treatment of AI from an ethical perspective.                             | Their national strategic approach to AI is commendable. | It is noteworthy in three aspects: the foundational open access models, the AI hiring rate, and having a national AI strategy. | Its role is prominent in foundational open access models, in a national AI strategy, in its educational program on AI, and in promoting gender diversity in the AI workplace with inclusive policies. |
| Its legislative regulation on AI is also noteworthy.          | Their approach to developing technologies that enhance safety and social well-being is important. |                                                         |                                                                                                                                |                                                                                                                                                                                                       |
|                                                               | Private investment in this field is significant.                                                  |                                                         |                                                                                                                                |                                                                                                                                                                                                       |

Source: Information extracted from De María, S. (2024), United States leads the world in Artificial Intelligence development: which countries make up the top 10, infobae. The charts are original.

Figure 1. Latin American AI Index 2024



Source: Information extracted from Muñoz, R. (2024), These are the leading countries in Artificial Intelligence in Latin America, Mercado. The graphic is original.

5. Conclusions

Artificial intelligence and other virtual technologies are a viable option for citizens’ daily lives, as they simplify routine tasks, streamline work, and make life easier. It’s also worth noting the vast potential

**Table 4. Leading countries in AI 2024**

| Chile                                                           | Brazil                                                                                              | Uruguay                                        | Argentina                                                                                     | Colombia                                             | Mexico                                                                                                                           |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Invest in technological infrastructure.                         | Its technological infrastructure stands out.                                                        | It excels at adopting AI technologies.         | AI advancements in agriculture, industry, and services.                                       | Advancement of AI in the public sector.              | Advance in academic research.                                                                                                    |
| Support innovation.                                             | It excels in R&D (Research and Development) in AI.                                                  | It stands out in technological infrastructure. | Growth in publishing at a scientific level.                                                   | Investment in technological infrastructure.          | Progress in training specialist talent.                                                                                          |
| Develops specialist talent.                                     | AI technology for manufacturing, healthcare, and finance industries.                                | Develop the research area.                     | One area for improvement is to create regulations that are appropriate to the subject matter. | Investment in training to acquire specialist talent. | Use of AI in the manufacturing and finance sectors.                                                                              |
| AI technology for health , education and public administration. | High patent rate .                                                                                  | Ability to attract talent in AI .              | OtherAn area for improvement is to strengthen the technological infrastructure.               | One area for improvement is research .               | An area for improvement in governance with public policies that prioritize ethics in AI.                                         |
| Ethical AI governance with appropriate regulation.              | Its area for improvement lies in governance (it has challenges in the adoption of public policies). | Private investment in startups.                | Another area for improvement is training specialist talent.                                   | Another area for improvement is AI governance.       | Another area for improvement is to approve regulations that promote legal certainty for private companies and the public sector. |

Source: Information extracted from Muñoz, R. (2024), These are the leading countries in Artificial Intelligence in Latin America, Mercado. The graphic is original.

for practical applications that is opening up before us, as progress seems unstoppable and accelerating rapidly.

As has historically been the case, no substantial change brings advantages without drawbacks that will have to be faced sooner rather than later, and the challenges come from different directions:

There is a need to implement public policies that address security issues, limit illegal practices, and establish quality controls to determine responsibility, so that incidents like the one involving the young man who allegedly committed suicide following advice from the well-known ChatGPT do not occur (Duffy, 2025). It is essential that AI be developed ethically and sustainably over time (Brunet, 2023, 57-66).

AI impacts the economy and the labor market, which requires preparing workers for the jobs of the future (Pinto et Granja 2023, 50-62).

There is a need to approve regulations that provide legal certainty without hindering progress. The lack of practicality in countries like Spain or continents like Europe, which resist change with excessive regulations that stifle innovation, is unacceptable (Pedreño, 2022, 70-76).

There is a need for investment from governments, and ideally also from the private sector, to undertake rigorous research. Some countries will lead the technological race, but this measure aims to close the gap, as seen in the case of Latin America. Even though Latin America has countries with immense wealth potential and some territories at the forefront of their respective regions, the disparity between the two blocs is considerable when compared to the US or China, as is the case in Europe.

The need to create infrastructures that provide solidity and do not remain on a theoretical level, but rather make them competitive in an emerging market, which could attract specialized talent.

It is necessary to obtain patents, which give countries a position with specific weight on the international stage.

**Author's contribution**

María de las Nieves Navarro-Mozo: [Conceptualization, methodology, formal analysis, research, original draft](#)

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