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ORIGINAL ARTICLE

Effects of economic innovation on growth and development in OECD countries

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Abstract

Economic and macroeconomic policy study to analyze how innovation and digitization have impacted developed economies, resulting in key factors to improve their level of well-being. After presenting a synthesis of the main theoretical frameworks in this regard, we proceed to systematize and compare the results obtained during the fourth industrial revolution, by addressing variables such as the level of digitization, R+D+i and its institutional framework. It is thus intended to clarify a series of paradoxes about the digital transition, as well as the study of new tools in the digital financial field, such as the case of cryptocurrencies or crypto actives. Economic policies have been very diverse within these countries, where models such as liberal, conservative, or social democrat are mostly taken, with different effects on their economic results. In addition, we will also make a brief reference to the influence that the use of some intelligence tools is having in some OECD countries, and determine if its effects are being adequate, or if it is necessary to continue working to achieve the goals proposed by different political programs. Following the analysis carried out, we will make a series of decisions about whether the OECD countries are obtaining the desired results.

Keywords: Innovation, development, growth, technology, economic welfare, and economic policy.

1. Introduction

The subject of study in this article is focused on determining how new technologies and R+D+i have enabled different countries in the OECD to improve their levels of economic growth and development.

We will conduct a detailed analysis in which we will examine how those countries that have chosen to incorporate economic policies based on digitization, innovation, and R+D+i have been able to achieve higher levels of production, significant economic and social development, lower unemployment rates, and excellent levels of productivity and economic well-being. We will consider the following points:

- Explain the essence of innovation, growth, and development, representing their effects on the economic and social levels.
- Analyze the existing relationship between digitization and economic well-being, distinguishing the effects on productivity and talent growth.
- Determine the theoretical frameworks in which OECD member countries have operated, observing why significant differences exist among various states.
- Measures implemented by different OECD countries in the areas of innovation and development, where a comparison will be made across the following continents: Europe, Asia, America, and Oceania.

- Formulate a hypothesis in which we will verify whether innovation levels allow for the construction of much stronger economies than those that do not allocate resources to digitization, R+D+i, and new technologies.
- Compile all the data obtained and draw relevant conclusions in accordance with the presented study.

2. Materials and Methods

The study carried out throughout this work corresponds to the disciplines of Political Economy and Public Finance, and Economic Policy, with special attention to the areas of State Welfare Economics and Digital Economics.

Regarding the theoretical framework, we consider the following three economic frameworks (Huerta de Soto et al., 2021; Sánchez-Bayón et al., 2022): the Austrian School, whose economic thought is based on minimal state intervention in the economy and its corresponding privatization at general levels; neo-Keynesianism, where state intervention and the public sector form the basis for creating an economy with a multitude of public resources; and finally, neoinstitutionalism (Public Choice, Law & Economics, Constitutional Economics, etc.), which advocate for the presence and complementarity of the public and private sectors in the economy.

As for the methodological framework, in this work, we will employ the historical framework, which will allow us to trace the evolution of data over time, facilitating a more comfortable comparison and enabling us to draw different conclusions based on the observations made.

Therefore, thanks to these two methodologies, the analysis of innovation in the growth and development of countries will be carried out, where digitization will enable us to determine the technological advancements implemented throughout history.

In general, the state of the question primarily focuses on the evolution of innovation and development in OECD countries in recent years. To this end, various articles and journals have been consulted: a) Paradigmatic Change and Copernican Revolution in Economics (Sánchez-Bayón, 2019a, 2020a-c, 2021a-d, and 2022a-b; Sánchez-Bayón et al., 20022a-b); b) Digital Transformation and Labor Relations (García Vaquero et al., 2021; Sánchez-Bayón, 2019b-g, and 2020d-e; Sánchez-Bayón y Trincado, 2021a-b); c) Crisis of the State Welfare Economics and Transition to Personal Welfare Economics (Alonso et al., 2021; García Vaquero et al., 2021; Sánchez-Bayón, 2020f, 2021e-f); d) The Impact of Digitization on the Economy (Santor, E, 2020; Siuta-Tokarsa, B, 2020; Zmija, K, 2020); e) The Rise of Artificial Intelligence and Its Influence on the Economy (Cordon, O, 2018; Ruiz, J, 2020; Sánchez JL, 2020; Bernal, C, 2020; Robles, A, 2022; Onieva, L, 2022; Bejines, C, 2022).

Based on the information gathered from these various articles, several additional contributions to their theoretical concepts were made. For instance, I provide a practical analysis (not exclusively theoretical) of the consequences of implementing digitization and innovation. Additionally, I discuss the different outcomes observed in recent years and the potential improvements to be implemented in the coming years. Furthermore, I include some practical cases, such as the economy of El Salvador adopting cryptocurrencies as its official currency for transactions, as well as the implications that artificial intelligence may have on the current and future economy.

3. Literature Review

3.1 Conceptual Aspects

3.1.1 Innovation

Innovation has been a differentiating factor for many companies throughout the 20th century, synonymous with competitiveness and growth. One of the most influential authors in this concept was undoubtedly Joseph Schumpeter, who observed how the incorporation of new technologies into the economy favored the development of nations. According to Schumpeter, innovation would encompass the following areas:

- The introduction of a new product in a specific market, characterized by being unknown to consumers, thus forming a new class of goods.
- The emergence of new methods of production, stemming from the Second Industrial Revolution, where industrial mechanization was a significant advancement in facilitating new studies.
- The opening of new markets in a specific country, thereby increasing competitiveness in the economy.
- The acquisition of new raw materials, enabling the creation of new markets.
- The emergence of alternative market structures, including monopolies or oligopolies.

Therefore, the concept of innovation has been explained by various authors with a multitude of arguments and reasoning over the past decades. It leads us to the conclusion that all countries that decide to invest in their levels of R+D+i have highly competitive economies to face any adversity, be it political, social, or economic. Additionally, these investments allow countries to have infrastructures and patents at both national and international levels. Contrarily, countries with insufficient resources in terms of innovation have fewer opportunities to create prosperous economies and face more challenges in various aspects. With the evolution of the concept of innovation throughout history, multiple classifications have been made. We will focus on the classification provided by the Oslo Manual (2005), developed by the OECD itself, which distinguishes four types of innovation: product innovation, process innovation, organizational innovation, and market innovation.

- **Product Innovation**: The Oslo Manual mentions that for a specific product to be considered innovative, its basic characteristics must be significantly better than those of previous designs, qualifying them as innovative in marketing terms.
- **Process Innovation**: When referring to process innovation, we are talking about the incorporation of new methods of distribution and production, allowing for the management of raw material distribution.
- **Organizational Innovation**: When we talk about incorporating innovation into organizational processes, we are referring to the adoption of new strategies, new knowledge systems, innovative team structures, and decentralized measures, including international relationships.
- **Marketing Innovation**: As seen in the previous section, J. Schumpeter defined innovation as the creation of new markets, a concept later updated by Johne to include market improvements through the use of marketing. Within this branch, we can distinguish the so-called 4Ps: Product, Price, Distribution, and Promotion.

In summary of this section, we can affirm that the innovation process is quite complex to understand, as multiple factors are involved, and decisions are often not made in isolation. Furthermore, for a country to be efficiently innovative, it must meet the four assumptions mentioned earlier to have a higher probability of achieving excellent results.

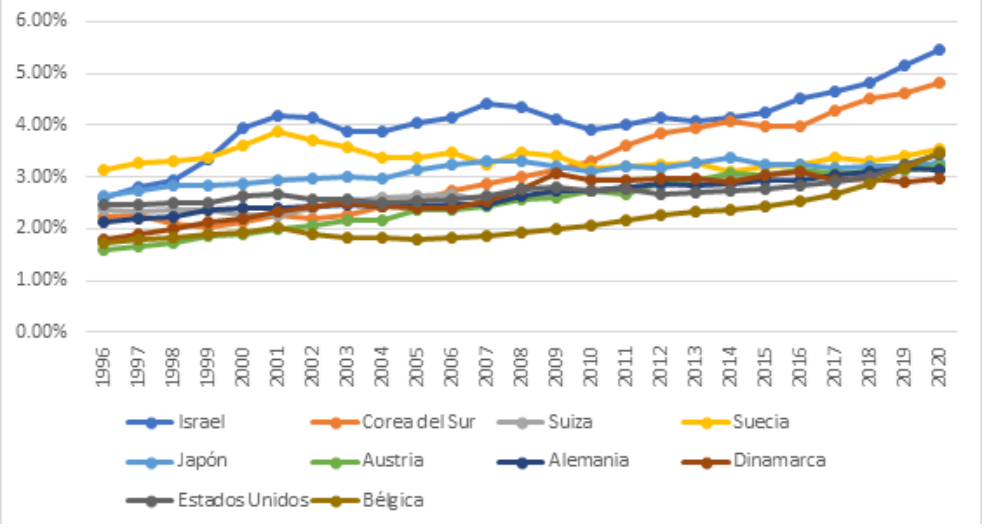
To formulate various public policies, it is essential to measure innovation accurately. While measures of innovation have been implemented in the business world, they may not be precise enough to determine real levels of economic innovation, requiring further exploration.

For this reason, the OECD has been working over the past decades to create more comprehensive and precise indicators, collecting data from individual, business, and organizational domains. Close relationships have been confirmed between patents and R+D+i, leading to companies with greater growth, development, value, and productivity. Additionally, we must mention the role of new technologies (ICT) and improvements in business organization, which have also favored the innovation process.

Another relevant measure for our study is undoubtedly intangible assets, those with a longer duration (R+D+i, software, workforce, equipment, etc.), which have provided greater productivity to their economies.

To conclude this section, we should take a look at the countries with the highest innovation indices and the countries with the highest levels of R+D+i investment as a percentage of GDP among OECD countries, as shown in Figure 1.

Figure 1. Higher R+D+i Expenditure 1996–2020 in OECD Countries as a Percentage of GDP



Source: Author's own elaboration based on data from the UNESCO Institute of Statistics.

Therefore, when comparing the previous table and graph, we can conclude that countries that allocate more resources to R+D+i have a higher GDP compared to countries that do not invest in this area. With a high GDP, countries can generate wealth and well-being for their citizens. It is evident that countries with higher investments in R+D+i have higher levels of innovation, productivity, and resource generation in the economy.

3.1.2 Economic Growth and Development

Economic growth is defined as the increase in a country's production of goods and services over a specific period. For example, if investments, exports, imports, or the production of goods and services increase, we can say that a country has experienced economic growth.

In this way, the entire population will benefit, as their levels of economic well-being will be satisfactorily increased. It is clear that to measure economic growth, we need several indicators, including:

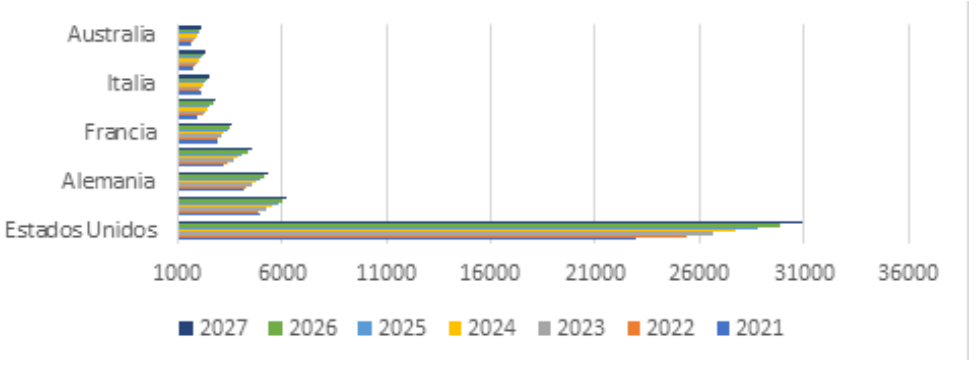
- **Gross Domestic Product (GDP)**: This is one of the most commonly used indicators to determine whether a country is experiencing growth or recession. It includes the total value of goods and services produced in a year.
- **GDP per capita**: This indicator is closely related to GDP but provides specific information about the wealth or quality of life of the members of a nation.
- **Inflation**: Another popular concept when discussing a country's growth. Inflation measures the overall increase in the prices of goods and services, and the Consumer Price Index (CPI) is used to determine the exact price evolution.
- **Unemployment rate**: This rate helps us understand the level of the population that is unemployed and the different conditions of individuals.
- **Human Development Index**: This measure, established by the United Nations (UN), helps determine whether countries are developed, underdeveloped, or in the process of development.

- **Per capita income**: This is the average income received by a taxpayer and is calculated by dividing a nation's income by the total number of inhabitants.
- **Inequality**: To understand the levels of inequality in an economy, we use two sub-indicators: the Lorenz curve and the Gini coefficient. The Lorenz curve shows income inequality in a country.

Both economic growth and development are closely related because growth increases production, and development involves different transformations to improve a country's economic structure. It is a complex process in which incorporating development without growth is very challenging.

Next, we will see which countries experienced the highest economic growth and development during the past year within the OECD and what their future expectations are, as shown in Figure 2.

Figure 2. Countries with the Highest GDP Growth and Future Expectations 2021–2027 According to the World Bank (GDP in billions of dollars)



Source: Author's compilation based on 2022 Statista data

As a conclusion to this section, we must mention that both growth and development are essential for building a robust country. They promote productivity, exports, imports, community and non-community investments, services offered, and the production of goods and manufactures. If a country can be efficient in these areas, its economy will have no trouble continuing to generate growth and development for its citizens, and it will have excellent economic indicators as explained earlier.

3.2 Theoretical Framework

Regarding theoretical frameworks, the countries that make up the OECD have proposed various ideals. It is evident that not all countries have implemented these frameworks in the same way. Therefore, we will closely examine the main characteristics of these frameworks and their impact on levels of growth, development, innovation, and digitization. The three currents we will analyze are as follows: Mainstream (classical, neoclassical, and interventionist), Mainlane (institutionalists), and Critics (socialists, social democrats, and communists).

3.2.1 Mainstream Approach

The mainstream approach encompasses classical, neoclassical, and institutionalist authors. It is clear that classical and neoclassical economists share most of their ideals, unlike interventionists who have an alternative view on economic matters.

In terms of outcomes, the liberal countries that have achieved better results in recent years include New Zealand, Australia, and Switzerland. Their economic policies are based on reducing taxes to allow individuals to have higher levels of income and privatizing sectors, so that the state has minimal involvement in economic policy.

As for the analysis of the mainstream or liberal approach, its main virtues include the freedom individuals have in their private lives, whether in the political, social, or economic sphere, in the face of

any authoritarian threat. From a political perspective, everyone has the complete freedom to choose their representatives in elections; in the social realm, each individual has the choice to live their life without restricting the freedoms of others; and in the economic sphere, saving, entrepreneurship, and innovation are encouraged.

3.2.2 The Mainlane Approach

Regarding the mainlane approach, we can include institutionalists. The main ideals of this school of thought focus on the creation of institutions, habits, and new rules that allow for economic progress. The institutionalist approach shifts from ideas belonging to individuals and economic processes to ideas related to economic institutions and the types of economies that exist.

One of the most prominent examples of institutionalism is found in North American countries, where the United States stands at the forefront behind China. Institutionalism has led to significant economic advancements in these countries. The United States, in particular, has one of the world's most complex economies, with substantial investments in innovation, research, development, and the digitization of the economy.

Nations can base their growth on sustaining inclusive institutions, which can generate employment opportunities for their citizens, provide adequate public services for the population, and ensure a more or less equitable income distribution throughout society. However, institutions must also oversee an efficient private system that guarantees citizens' private property and promotes processes of industrialization and high-level technological education.

On the other hand, countries like China and Russia operate under an extractive institutional system, characterized by higher taxes and lower levels of industrial and technological development. Consequently, these countries are not advancing at the same pace as those with inclusive institutions.

3.2.3 The Critics' Approach

Within this approach, we find the left-leaning ideologies, with socialism, social democracy, and communism as its main proponents. During the Cold War, critical approaches were prevalent in opposition to the classical or liberal current. This gave rise to what is known as the New Economy, characterized by a more modernized form of socialism and an alternative to Marx's communism from the previous century. Thus, from the 1980s, some changes such as market liberalization and the dismantling of the USSR took place, but many countries continued to practice public policies in which the state played a fundamental role in achieving economic growth and development.

The most notable examples in the social democratic currents are the Nordic countries such as Iceland, Norway, Denmark, or Sweden. These countries have effectively managed their public spending, implementing public policies that generate sufficient revenue to invest in various public sectors. Additionally, they have achieved high levels of digitization compared to other global economies that have not adopted the nation-state model. However, not all countries that have embraced socialist policies have had positive outcomes, as seen in most Latin American countries. The large-scale extraction of gold by major countries has led Latin America into a chronic state of poverty, with many of its countries colonized by the United States and the United Kingdom during the 17th and 19th centuries.

Analyzing the advantages of the critics' approach, we find the following: a greater role for the state in the economy, aiming to provide most public services to its population; a reduction in inequality levels through measures that promote greater wealth redistribution, and prioritizing collective welfare over exclusive benefits for certain groups.

4. Results

4.1 Relationship between Digitalization and Economic Well-being: Productivity and Talent

In this section, we will analyze in detail the most significant effects of digitalization on economic well-being, leading to the emergence of new talents and increased productivity in various economic

sectors. It is worth noting that the advances made in recent years have been positive and have allowed many economies to become more competitive.

4.1.1 Digital Transition in Business and Employment

To analyze how labor relations have evolved, it is necessary to go back to the socialist era. With the advent of the Second Industrial Revolution, many activities in the primary sector took a back seat, as companies and industrialization led to increased productivity. Many citizens migrated from rural areas to large cities during this period. It wasn't until the late 1970s that the tertiary sector experienced significant growth in economic well-being, with workers in the private sector, public companies, and sophisticated factories. Regarding human capital, the United States and Asian countries have positive feedback..

4.1.2 Influence of New Technologies and Digitalization on General Well-being

The digital transition has become one of the new phases of the digital economy, allowing for the construction of a model based on entrepreneurship, talent, and well-being. Economic digitalization has primarily focused on the development of digital currencies, such as cryptocurrencies.

It is crucial that new technologies become a part of our lives, enabling access to new job opportunities that did not exist decades ago and continuing to invest in new technologies to improve existing infrastructure and streamline production processes for the future.

Cryptocurrencies or digital currencies are decentralized units that can be used as an alternative method of payment to traditional means. One characteristic of these currencies is that they are not regulated by any economic entity, although several countries have sought their approval as a means of payment, with El Salvador being a notable example. The functioning of cryptocurrencies is based on the implementation of blockchain technologies, where a series of digital blocks are recorded.

Today, cryptocurrencies have revolutionized our economies in the face of the fading traditional banking system, offering new alternatives for customers who have not yet gained access to the banking system. This is why if banks want to survive in the future, they must take a step further through digitalization and continue to invest in cryptocurrencies and blockchain technologies.

Digital currencies also offer multiple advantages, such as reducing transaction costs. The inclusion of these technologies has allowed international financial markets to have positive profitability compared to traditional instruments. Another advantage of cryptocurrencies is that they bring value to the system for customers, sometimes without having to pay fees. The last advantage we mention is the speed and simplicity of transactions. With this project, we would be promoting the development of new technologies, economic globalization, and the streamlining of the economy.

4.1.3 Effects of Minimum Wage on Well-being and the Digital Economy

The COVID-19 crisis has become the new current crisis, inheriting the 2008 financial crisis. After the outbreak of the pandemic, various forms of protectionism and trade wars emerged (such as the case of the United States and China), causing debt to increase progressively in 2020. As a result, the EU had to approve the non-compliance clause of economic growth and stability pacts. In the wake of this crisis, the debate arose in many global economies about the need to increase the minimum wage, a measure that can benefit many people but can have detrimental effects on other economic agents and overall well-being.

There are many fallacies that claim that the minimum wage brings benefits to improving working conditions, but in reality, the one who benefits is the state or the public sector. The Nordic countries have shown how the minimum wage does not have positive effects on workers but benefits the state to increase its revenue levels. However, not only does this happen, but workers also lose purchasing power and see a substantial increase in public debt.

The increase in the Minimum Wage (SMI) also affects entrepreneurs and self-employed individuals, who will have to allocate more resources to their employees, resulting in lower levels of productivity as

they hire fewer workers and have to invest in robots or software programs to facilitate work. Another negative effect of raising minimum wage levels would be an increase in the prices of goods and services, which is detrimental to a country's economy and has repercussions for future generations.

Therefore, we can affirm that the Minimum Wage is a deceptive tool used by populist parties, informing people that their well-being will improve, but in reality, it brings a decrease in productivity, reduced hiring by large companies or organizations, higher inflation rates (IPC), increased public debt and deficit, and reduced revenue.

4.1.4 Effects of Digitalization on Labor Relations and Production Processes

Digitalization has changed the traditional labor market as we historically knew it, through the incorporation of new forms of work such as telecommuting, allowing greater flexibility for workers as well as new job opportunities for many.

Friedrich Hayek was one of the most influential economists of the last century, and he analyzed how savings impacted real wages and how an increase in wages above productivity levels would cause various imbalances. He also studied economic cycles and the theory of capital. Hayek's statements reference David Ricardo to explain why there were distortions in productivity levels due to wage variations.

Therefore, we conclude that it is essential for countries to manage their budgets well to drive digitalization today. If states do not decide to digitize their economies, there will likely be greater difficulties in promoting various areas of research.

4.2 Comparison of Measures Implemented in Innovation and Digitalization by OECD Members

Next, we will closely examine the measures proposed by different OECD countries in recent years regarding innovation and digitalization on the continents and assess the results in their economies, evaluating whether they have been positive, negative, or if further changes are needed. To do this, we will look at the economic budgets established to implement these plans and policies.

4.2.1 Innovation and Digitalization in European OECD Countries

The European Union has positioned itself as one of the leading continents that allocate significant resources to research and innovation to build a future in Europe. Investment in innovation aims to address various economic challenges with the intention of improving the well-being of all European citizens.

These measures have the primary objective of enhancing both collective and individual well-being. The Treaty of Lisbon (2007) strengthened the EU's research field and aimed to create a European Research Area.

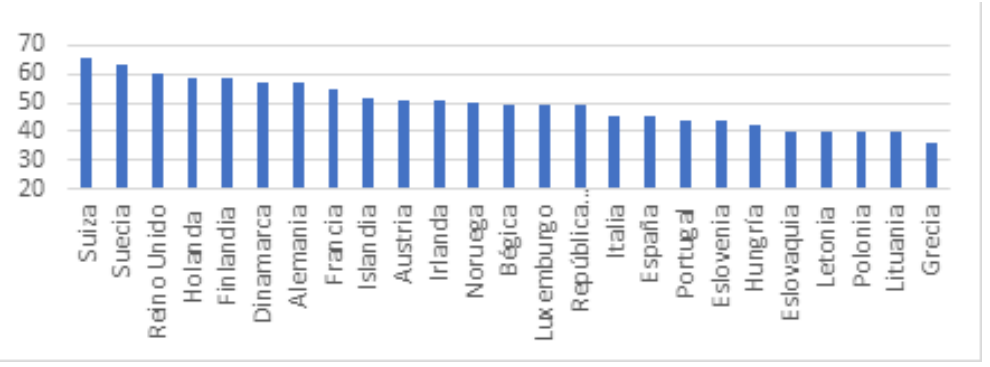
The EU has numerous funding programs to support its research and development initiatives, including efforts to strengthen the EU in the field of science, build a new digital industrial revolution, invest in new technologies, and support the creation of new businesses.

Regarding digitalization, new technologies are positively changing the lives of European citizens, enabling the generation of new businesses and striving to become a climate-neutral continent by 2050.

Next, we will look at which countries in the European continent, within the OECD framework, have achieved better results in recent years and which ones have not invested sufficiently in innovation and digitalization, as shown in Figures 3 and 4:

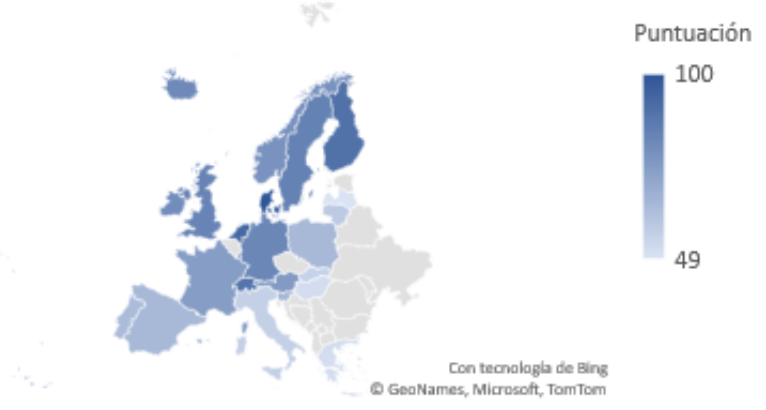
If we analyze innovation and digitalization, we can see that the Nordic countries stand out as one of the great examples in this continent. This demonstrates that their public policies of investment in research, development, innovation, and new technologies have allowed them to achieve higher economic growth and levels of well-being. In general, most European countries are highly developed, with the presence of major research centers and companies with high technological capabilities.

Figure 3. Innovation Index of European OECD Countries



Source: Own elaboration with data from Cornell University, 2021

Figure 4. Digitalization in European OECD Countries in 2021



Source: Own elaboration based on DIGIX data, 2021

4.2.2 Innovation and Digitalization in Asian OECD Countries

Turning our focus to the Asian continent, the levels of innovation achieved in recent decades have surpassed those of their closest competitors. The investment in I+d+i e and the number of patents created make Asia one of the continents with the highest number of unicorn companies worldwide, although it is surpassed by Europe. China, Japan, South Korea, Singapore, and Hong Kong are the countries leading the way in innovation, followed by less developed countries like Vietnam and India, which are just beginning to work in this sector.

One of the primary reasons why Asian countries have decided to allocate a significant portion of their budget to innovation is to build an efficient economy capable of dealing with potential new financial crises or global political conflicts that could affect other countries. For this purpose, innovation is being sought to create an attractive economy for national and international investors, as well as highly skilled labor to promote sustainable economic growth and avoid economic deficiencies.

If we focus on the levels of digitalization achieved by Asian countries, the results obtained have been very positive in recent years. Most Asian companies are taking advantage of advances in artificial intelligence, robotics, cryptography, and data utilization in the digital economy. Asia is also addressing these new technological challenges, combining them with other sectors and not causing shortages in those sectors. Digitalization has also brought about advances in the emergence of new digital sectors,

providing opportunities for new talents and increasing the productivity of their economies.

Asian agents are experiencing very good levels of growth in digitalization, along with other countries that are not yet sufficiently digitalized. The opening of new digital businesses and financial technology are sectors in which Asia leads the world, allowing for sustainable levels over time.

We can say that Asia is one of the continents that has achieved the most innovation in recent years, and this is the result of wise investments in the creation of new companies and policies that promote entrepreneurship and economic growth, in addition to having a sophisticated public healthcare system, as is the case in South Korea. Its levels of digitalization have been extraordinary in recent decades, being leaders in the production of new intelligent technological devices, as well as being one of the main digital product producers and exporters worldwide.

4.2.3 Innovation and Digitization in OECD American Countries

Regarding innovation in the countries of North America, the United States, Canada, and Mexico have made significantly positive advances over the past decades. In 1972, a cooperation agreement in research and science was signed between the United States and Mexico to promote science, technology, and economic growth, aiming to provide multiple solutions to citizens and continue developing their skills.

In 1994, the three North American countries signed a new agreement to strengthen their respective key economic sectors, emphasizing sustainable transportation improvement.

In 2004, another agreement was signed between Mexico and Canada to reinforce their economies, involving both public and private entities. One of the main measures approved was to incentivize e-commerce, allocate more resources to innovation, and promote national and foreign investment. The commitment to enhancing technological infrastructure and having highly qualified research centers to be leaders in science and technology continues.

In 2013, the United States and Mexico would sign two new agreements. The first of these took place in May, where the creation of a forum related to education, research, and innovation was agreed upon, with the goal of transforming North America into a region with a highly skilled human capital to further economic growth and development. In September, the Mexico-United States Council was established to promote competitiveness within the country, allowing companies to establish themselves freely, with particular emphasis on the private sector in the United States.

When analyzing the levels of digitization in North America, the United States and Canada are the two leading countries in the American ranking, with the former being the most influential. The transformation in various economic sectors has been quite notable in recent years, so let us now examine the various proposed measures in these sectors:

- **Banking Sector**: Many users opt for the use of digital applications to carry out their transactions and no longer require conventional means. Consequently, American banks have had to innovate in recent years to meet customer needs.
- **E-commerce**: Most of the companies are striving to transform their businesses to boost their digital operations.
- **Healthcare Sector**: The United States is characterized by a large number of companies dedicated to healthcare sciences, making their investment in digitization significant.
- **Transportation Sector**: The growing concern for our environment has led many companies to invest in new technologies to combat climate change and build a more sustainable planet.
- **Restaurant and Supermarket Sector**: Large American food chains are also adapting to digital transformation. For instance, Wegmans is a chain that allows its customers to scan and package their groceries while shopping, thus expediting the process.
- **Insurance Sector**: Undoubtedly, one of the most influential sectors in the United States, with technological changes improving the customer experience.
- **Manufacturing Sector**: Construction companies are reducing production costs through the implementation of digital transformations.

In the case of Latin America, different countries have made progress over the past twenty years to address poverty, both in the microeconomic and macroeconomic spheres. However, they still have a long way to go to continue growing and reduce levels of inequality.

It's also worth noting that Latin America allocates minimal resources to innovation, research, and development, leading to various challenges among political entities. In this regard, it is essential to establish technology investment programs to continue building competitive economies.

On the other hand, digitization in South America is at intermediate levels when compared to other global powers. Its position is superior to that of Africa and the Asia-Pacific region, but despite the progress made in recent years, it still lags behind North America and Europe, which have digitized more rapidly and incorporated more technological resources into their economies. If we examine the digitization growth rate, it is moderate and stagnant, indicating that recent advancements have not been reflected in recent years.

There is a clear difference between North and South American countries. Focusing on North America, Canada and the United States have a significant entrepreneurial landscape, allowing them to generate large companies and provide greater employment opportunities for their citizens.

4.2.4 Innovation and Digitization in Australia and New Zealand

One of the programs implemented on this continent is "Backing Australia's Ability," which has the primary objectives of generating and commercializing new ideas. Through this program, funding for innovation is increased each year, promoting the development of sectors such as technology and biotechnology. The governments of both countries insist that cooperation must be considered for the measures adopted in their political programs to be fruitful.

Another strategy implemented was the "Growth and Innovation Framework," recognizing the government's role in aspects related to the functioning of the economy, such as international investment, business competitiveness, and the strengthening of sectors like education, research, and industry. This innovation strategy is directly linked to governmental policies, being an essential factor for economic growth and development.

Regarding digitization, Oceania has made significant advances in recent years, although it lags behind Europe and Asia. Australia has one of the governments that has made substantial progress in digitization, achieving very positive results. This was achieved starting in 2012 when the Australian government launched a strategy called "Government 2.0" to address new technological challenges. The model is primarily based on linking new technologies with emerging political paradigms.

In the case of Australia and New Zealand, their funded innovation programs have proven to be successful, enabling them to establish research centers in science and the creation of competitive companies that maintain close relationships with larger continents, such as Europe and America.

4.2.5 Innovation and Digitization in Spain

In regards to our country, the European Union classifies us as a moderately innovative nation, according to the report published by the European Council in 2020, due to the fact that the necessary resources for R+D+I are not allocated as in some other European countries. Nevertheless, Spain has made progress in innovation in recent years, thanks to the increase in the number of graduates in fields such as science and research.

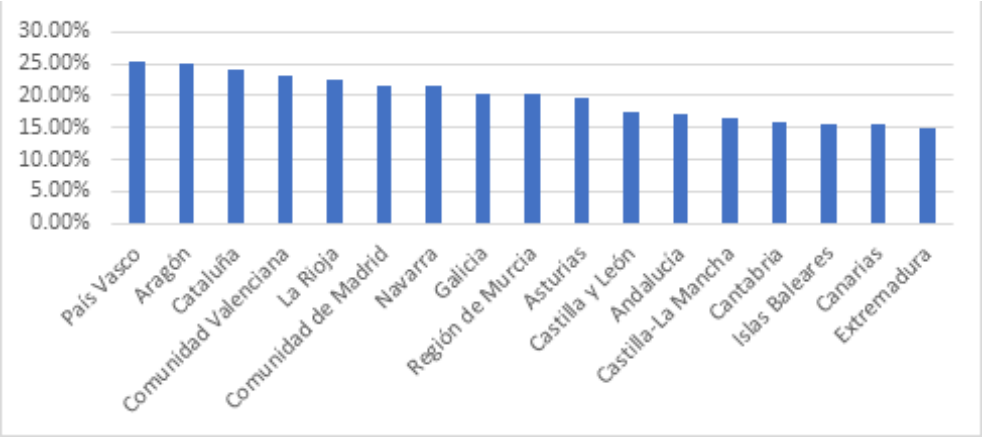
On the other hand, European funds have been a great ally to our country over the past decade, with the Horizon 2020 program being a notable example. This program, approved in 2020, received funding exceeding 1 billion euros, incentivizing new projects related to health and well-being.

Turning to the context of digitization, both government administrations and companies in our country continue to work towards improving digitalization levels through the optimization of new technologies. According to the Digital Economy and Society Index (DESI), which compares digitalization levels among European countries, Spain ranks 9th. This places Spain above the European average but considerably behind other countries, such as the Nordic giants or the Netherlands. Spain's

most advanced areas in terms of digitalization are the provision of public services and the deployment of fiber optic networks in recent years.

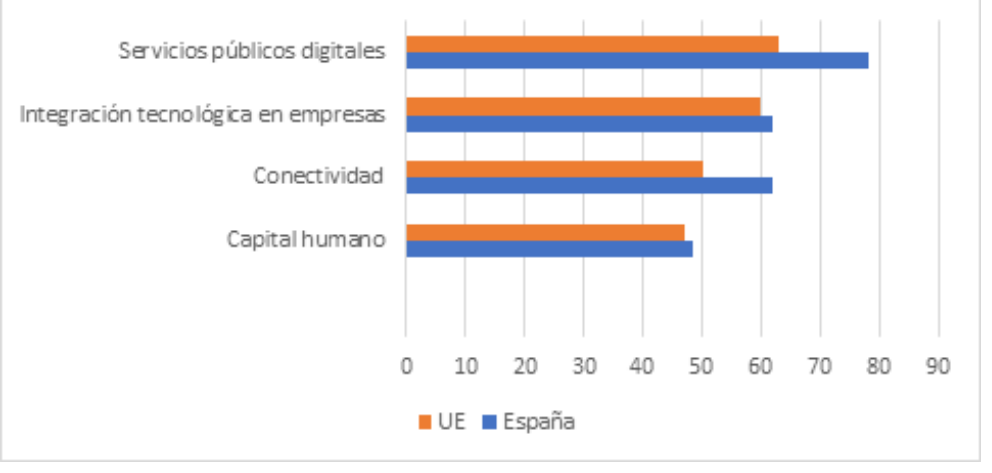
Next, we will briefly explain two graphs that reflect Spain's innovation and digitization in recent years, as shown in Figures 5 and 6:

Figure 5. Most Innovative Spanish Companies by Autonomous Communities 2017–2019 (Percentage)



Source: Own elaboration with data from INE 2019

Figure 6. Levels of Digitization in Spain Compared to the European Average in 2021



Source: Self-generated based on DESI data from 2021

When analyzing the levels of innovation and digitization, it becomes evident that Spain is a country that has not invested sufficiently in innovation. Consequently, it possesses limited resources in science and research. Additionally, its economic structure heavily relies on the services sector, making it vulnerable to economic recessions, as exemplified by the outbreak of the COVID-19 pandemic.

Innovation in today's economies has sparked a debate about the primary theoretical frameworks within which economies operate. This discussion arises due to the disparities observed among countries in terms of their growth and development. Therefore, it is imperative to investigate which policies should be adopted to construct competitive economies and address potential imbalances that may arise in political economics.

Firstly, we encounter classical or neoliberal authors and institutionalists, whose policies focus on the privatization of economic sectors and reduced state intervention in economic matters. Their ideals regarding growth and development center on incentivizing private enterprises, fostering a highly skilled workforce, with the citizen at the core of the economy, while relegating the public sector to a secondary role as the main economic engine. Liberal economic models have yielded positive results in countries such as Switzerland, Singapore, Australia, and New Zealand. These countries, through reduced public spending, have been able to invest in areas like new technologies and digitization, as well as enabling private research centers with proficient professionals. Within the institutionalist category, we mention the United States, whose economic policies have been liberal but also include the creation of global institutions. Results have also been quite positive in terms of I+d+i, growth, and digitization.

Secondly, we have Keynesian, neo-Keynesian, and institutionalist authors who advocate for a greater role of the state in the economy to address emerging issues and do not promote private services as much as more liberal economies do. The outcomes of this doctrine have been somewhat mixed. In Latin American countries, progress has been insufficient, with high levels of poverty and inequality compared to European and Asian continents. On the other hand, countries that applied economic policies more aligned with social democratic ideals, such as the Nordic powers (Norway, Finland, Sweden, and Denmark), have managed their growth progressively. Their policies have allowed them to offer a greater range of public services, particularly in education, with excellent academic results and the development of future talent. Notable advancements have also been achieved in innovation and digitization, with the Nordic countries standing out as the leading nations in terms of innovation and new technologies in recent years compared to other European countries.

Therefore, numerous theoretical frameworks have emerged throughout history, and the results obtained vary across different continents. The liberal approach has brought about increased private investment in innovation in private enterprises and research centers. This is why countries implementing these policies tend to have high levels of development, growth, and well-being when compared to countries adopting alternative approaches.

As for the socialist perspective, in which the state plays a more significant role in the economy, the results have been more debatable and subject to criticism. Firstly, we have the Nordic countries, which have managed their economies well over the past decades with an interventionist economic model, extensive provision of public services, high wages, and significant tax revenue. This has allowed them to excel in innovation and growth. However, Latin American countries have faced very negative consequences due to their socialist models, hindering their ability to achieve optimal economic growth and innovate in various fields such as science and research.

5. Discussions

Regarding discussions arising from this research, countries with higher levels of growth owe it to the resources they have allocated to innovation, as well as economic policies that promote investment and entrepreneurship through innovation. Meanwhile, countries that do not promote innovation or digitization are struggling to develop their economies and grow progressively. Additionally, the emergence of new concepts like artificial intelligence and new technologies prompts a debate about their necessity for the growth and development of OECD countries.

6. Conclusions

In conclusion, innovation and digitization are two essential tools that all countries should consider in their political programs, as their influence has generally been positive on a global scale. Furthermore, the adoption of new digital currencies or artificial intelligence tools (such as ChatGPT) is expected to increase in the coming decades. This will enable various OECD members to encourage people to develop their skills in the field of new technologies and improve the structural characteristics of international economies.

This study has shown how many countries have effectively worked to become leaders in innovation and digitalization, resulting in increased productivity and competitiveness. Meanwhile, other countries have lagged behind in the rankings. However, if they begin to digitize and innovate their economies in this decade, they could become more attractive to investors, multinational corporations, and eventually lead the rankings within the OECD, establishing themselves as globally prestigious economies.

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