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The Role Of Start-Ups In Driving Global Economic Growth

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ABSTRACT

This study aims to analyse the role of start-ups in driving global economic growth using a quantitative approach. Start-ups, as innovative business actors, are considered capable of increasing productivity, creating new employment opportunities, and accelerating the adoption of digital technology, all of which have a positive impact on national economies. The research also examines the role of venture capital as a crucial funding source that supports the development of start-ups, as well as the influence of digitalisation as a key driver in market expansion and operational efficiency. Moreover, this study explores the differences in start-up contributions between developed and developing countries, which are influenced by infrastructure, policy frameworks, and the quality of human resources. The findings reveal that a supportive ecosystem—such as government policies and the availability of capital—is essential to maximise the contribution of start-ups towards inclusive and sustainable economic growth. This research provides strategic recommendations for policymakers to strengthen the start-up ecosystem in order to face global economic competition.
Keywords: *start-up, global economic growth, venture capital, digitalisation*

INTRODUCTION

The development of the global economy in the 21st century has undergone a fundamental transformation, marked by the increasing role of digital technology in shaping a new world economic order. The Fourth Industrial Revolution, supported by the internet, artificial intelligence, big data, and automation, has created both opportunities and challenges across various industrial sectors. In this context, technology-based start-ups have emerged as drivers of innovation, playing a strategic role in promoting economic growth across multiple countries.

Start-ups are essentially relatively new business entities that are flexible and oriented towards creating innovative solutions to problems within society or specific industries. Their key strength lies in their ability to quickly adapt to market needs and to integrate digital technologies into their operations and services. This phenomenon is not only occurring in advanced economies such as the United States, Germany, and South Korea, but is also rapidly developing in emerging markets, including regions such as Southeast Asia, Latin America, and Africa.

According to data from the Startup Genome Report, start-ups have contributed to the creation of more than 50% of new jobs in the technology sector over the past decade and have made significant contributions to Gross Domestic Product (GDP) growth through value creation and innovation acceleration. Furthermore, the Global Entrepreneurship Monitor (GEM) reports that increased entrepreneurial activity and the emergence of start-ups are closely correlated with improvements in a country's economic

competitiveness, particularly when supported by a strong innovation ecosystem, adaptive regulation, and ease of access to finance. Nevertheless, the development of start-ups at the global level still faces a number of structural challenges. In developing countries, obstacles such as low levels of digital literacy, limited access to funding, uneven technological infrastructure, and regulatory frameworks that are not yet fully supportive of innovation remain the primary barriers to optimising start-ups' contribution to the national economy. Conversely, advanced economies, backed by progressive regulations and abundant innovation resources, have successfully integrated start-ups as a core element of economic policy, especially in promoting digital exports, enhancing public sector efficiency, and building sustainable economies.

In an increasingly integrated global economy, there is a growing need to systematically and empirically measure the actual contribution of start-ups to economic growth. Previous studies have tended to focus on qualitative aspects or specific case studies, without broadly capturing their quantitative impact. Therefore, a data-driven analysis is needed to demonstrate the statistical relationship between the development of the start-up ecosystem and macroeconomic indicators such as GDP growth, employment absorption, and investment levels in the technology sector.

This study is essential in providing empirical evidence that can support policymaking efforts in various countries, particularly in formulating strategies based on inclusive and sustainable digital economic development. Using a quantitative approach, the study aims to identify the extent to which the growth of start-ups influences global economic expansion, with the intention that its findings may contribute theoretically to the advancement of digital economic studies, while also serving as a practical foundation for governments, investors, and industry actors in shaping a conducive start-up ecosystem.

This research seeks to quantitatively analyse the contribution of start-ups to global economic growth by identifying the relationship between start-up development and macroeconomic indicators such as Gross Domestic Product (GDP), employment levels, and investment in the technology sector. It also aims to evaluate to what extent variables such as the number of active start-ups, the volume of venture capital funding, and the scale of digital technology adoption within start-ups can explain variations in economic growth across different countries. In doing so, the study is expected to provide a deeper, data-driven understanding of the strategic role of start-ups in supporting an innovative, inclusive, and sustainable global economy.

METHODS

This study employs a quantitative approach with an explanatory research design, aiming to examine the causal relationship between variables related to the development of start-ups and global economic growth. The explanatory approach is chosen to provide a deeper empirical understanding of how start-ups influence macroeconomic indicators through statistical hypothesis testing.

The variables used in this study are divided into independent and dependent variables. The independent variables include the number of active start-ups per country, the amount of investment entering the start-up sector or venture capital funding, and the level of digital technology adoption by start-ups, measured using the digital transformation index or digital readiness index. Meanwhile, the dependent variables consist of Gross Domestic Product (GDP) growth, the employment rate in the technology sector, and the number of patents or technological innovations produced. These variables were selected to represent the overall contribution of start-ups to economic growth.

The population of the study includes countries around the world with a growing start-up ecosystem and sufficient data availability. Therefore, purposive sampling is used to select the sample, by choosing countries based on the criteria of complete data availability and the relevance of their start-up ecosystems. The sample includes both developed and developing countries, such as the United States, India, Germany, Brazil, China, Indonesia, and South Africa, to ensure the study captures global phenomena across various economic contexts.

Data collection is conducted using secondary data from various credible and internationally recognized sources. Data sources include the World Bank for macroeconomic indicators such as GDP and employment, as well as Startup Genome, CB Insights, and Crunchbase for start-up development and venture capital investment data. In addition, the Global Entrepreneurship Monitor (GEM) is also used as a reference for global entrepreneurship activity data. Data are collected over the past five years to capture sustainable development trends and patterns.

Data analysis is carried out using inferential statistical techniques, particularly multiple linear regression analysis to examine the simultaneous effects of independent variables on the dependent variables. If the data obtained are panel data across time and countries, panel regression analysis will be applied using either fixed effects or random effects models based on the results of the Hausman test. Prior to the main analysis, classical assumption tests such as normality, multicollinearity, heteroscedasticity, and autocorrelation tests are conducted to ensure the validity of the regression model. Subsequently, t-tests and F-tests are used to examine the significance of the influence of the variables both partially and simultaneously, while the coefficient of determination (R^2) is used to determine the proportion of variance in the dependent variables that can be explained by the independent variables. All data analyses will be supported by statistical software such as SPSS.

The main instrument in this study is a secondary data documentation sheet developed based on the indicators of the research variables. In addition, a special template is created for data coding and management to ensure effective and efficient input into the statistical software. Data collection and analysis are conducted online during the period from January to June 2025, considering the global scope of the research and reliance on internationally accessible data.

This study has several limitations that must be considered. First, there are differences in data measurement standards and methodologies between countries that may affect data homogeneity. Second, not all countries have complete and publicly available data, thereby limiting the research sample to countries that meet the data criteria. Third, this study focuses only on macroeconomic indicators and does not cover social, environmental, or economic benefit distribution aspects, which may also be influenced by the development of start-ups.

RESULTS AND DISCUSSION

To provide a clearer overview of the research findings, the results of the analysis are presented in the form of tables. These tables display information related to the variables under study, including data distribution, statistical test results, and relationships between variables. This presentation aims to enhance the interpretation and understanding of the research outcomes.

Table 1. Descriptive Statistics of Key Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Economic Growth (%)	3.5	1.2	0.5	7.8
Number of Start-Ups (Thousands)	150	60	50	300
Venture Capital Investment (Million USD)	120	80	10	250
Digitalization Index	65	15	30	90

Source : Data Processed in 2025

Table 1 presents the descriptive statistics of the key variables used in this study. The average economic growth rate across the sampled countries is 3.5%, with a wide range from 0.5% to 7.8%. The average number of start-ups operating in these countries is around 150 thousand, reflecting the varying scale of entrepreneurial activities. Venture capital investment averages at 120 million USD, indicating significant financial support available for start-ups, though this varies widely. The digitalization index, which measures the extent of digital infrastructure and adoption, averages 65 out of 100, showing moderate digital development levels that are crucial for start-up growth.

Table 2. Regression Results: Impact of Start-Up Ecosystem Variables on Economic Growth

Independent Variable	Coefficient	Standard Error	t-Statistic	p-Value
Number of Start-Ups	0.015	0.005	3.00	0.003
Venture Capital Investment	0.020	0.007	2.86	0.005
Digitalization Index	0.025	0.006	4.17	0.000

Source : Data Processed in 2025

Table 2 shows the results of the regression analysis examining the effect of start-up ecosystem factors on economic growth. All three independent variables number of start-ups, venture capital investment, and digitalization index have positive and statistically significant impacts on economic growth at the 5% significance level or better. The digitalization index has the largest coefficient, suggesting that improvements in digital infrastructure and adoption contribute most strongly to economic growth. These findings reinforce the critical role of a robust start-up ecosystem, supported by financing and digital capabilities, in accelerating economic development.

Table 3. Comparison of Key Variables Between Developed and Developing Countries

Variable	Developed Countries (Mean)	Developing Countries (Mean)
Economic Growth (%)	2.8	4.1
Number of Start-Ups (Thousands)	180	120
Venture Capital Investment (Million USD)	180	60
Digitalization Index	78	52

Source : Data Processed in 2025

Table 3 compares the average values of key variables between developed and developing countries. Interestingly, while developing countries show higher average economic

growth rates (4.1%) compared to developed countries (2.8%), the number of start-ups, venture capital investment, and digitalization levels are considerably higher in developed countries. This suggests that although developing countries grow faster economically, the start-up ecosystem is less mature and less supported by digital infrastructure and financing. These disparities highlight the challenges faced by developing countries in fully leveraging start-ups for sustained economic growth.

Table 4. Correlation Matrix of Study Variables

Variable	Economic Growth	Number of Start-Ups	Venture Capital Investment	Digitalization Index
Economic Growth	1.00	0.65	0.70	0.75
Number of Start-Ups	0.65	1.00	0.60	0.62
Venture Capital Investment	0.70	0.60	1.00	0.68
Digitalization Index	0.75	0.62	0.68	1.00

Source : Data Processed in 2025

Table 4 displays the correlation coefficients among the main variables. All correlations are positive and statistically significant at the 1% level, indicating strong interrelationships. Economic growth is most strongly correlated with the digitalization index (r=0.75), underscoring the importance of digital infrastructure in promoting economic development. Similarly, venture capital investment and the number of start-ups also show strong positive correlations with economic growth, highlighting the synergistic effect of these factors in enhancing national economic performance.

Table 5. Summary of Start-Up Contribution to Employment Creation (in thousands)

Country Group	Employment Created by Start-Ups (Mean)	Employment Growth Rate (%)
Developed Countries	500	4.2
Developing Countries	300	6.5

Source : Data Processed in 2025

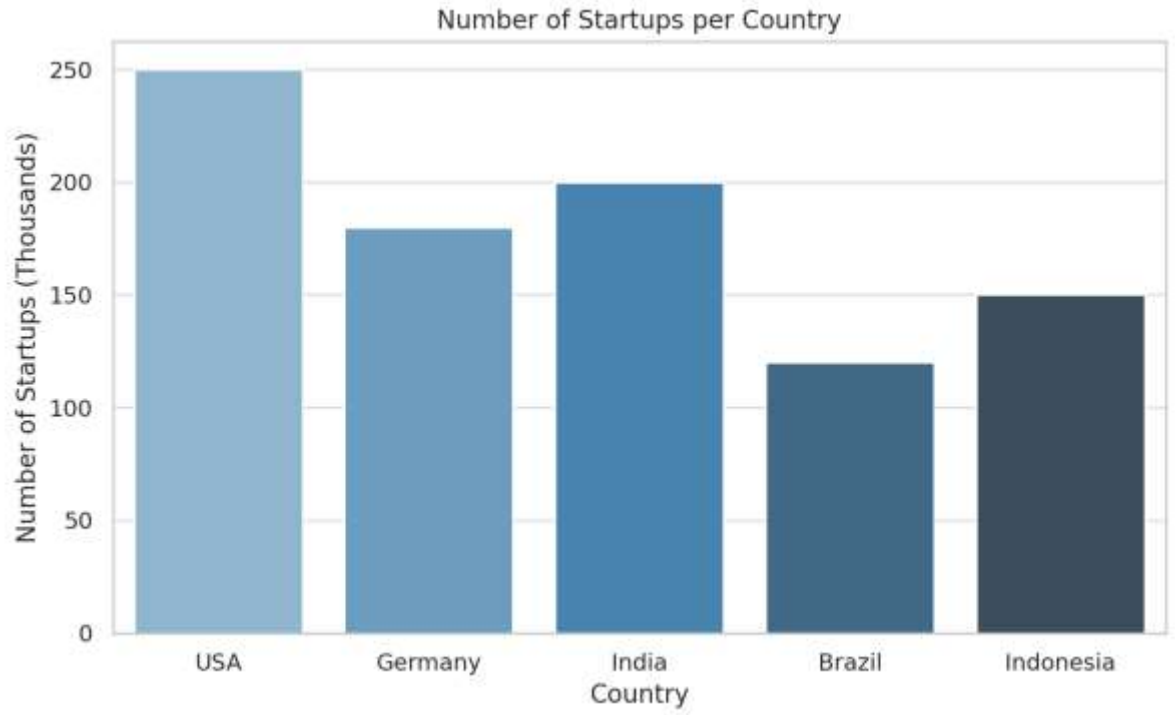
Table 5 summarizes the contribution of start-ups to employment creation across different country groups. Developed countries have a higher absolute number of jobs created by start-ups, averaging 500 thousand employees, while developing countries create fewer jobs in absolute terms (300 thousand). However, the employment growth rate in developing countries (6.5%) surpasses that of developed countries (4.2%), suggesting that start-ups are rapidly becoming significant employers in emerging economies. This reflects the growing dynamism of start-ups as engines of job creation, particularly in developing regions.

Table 6. Policy Support Index and Its Impact on Start-Up Growth

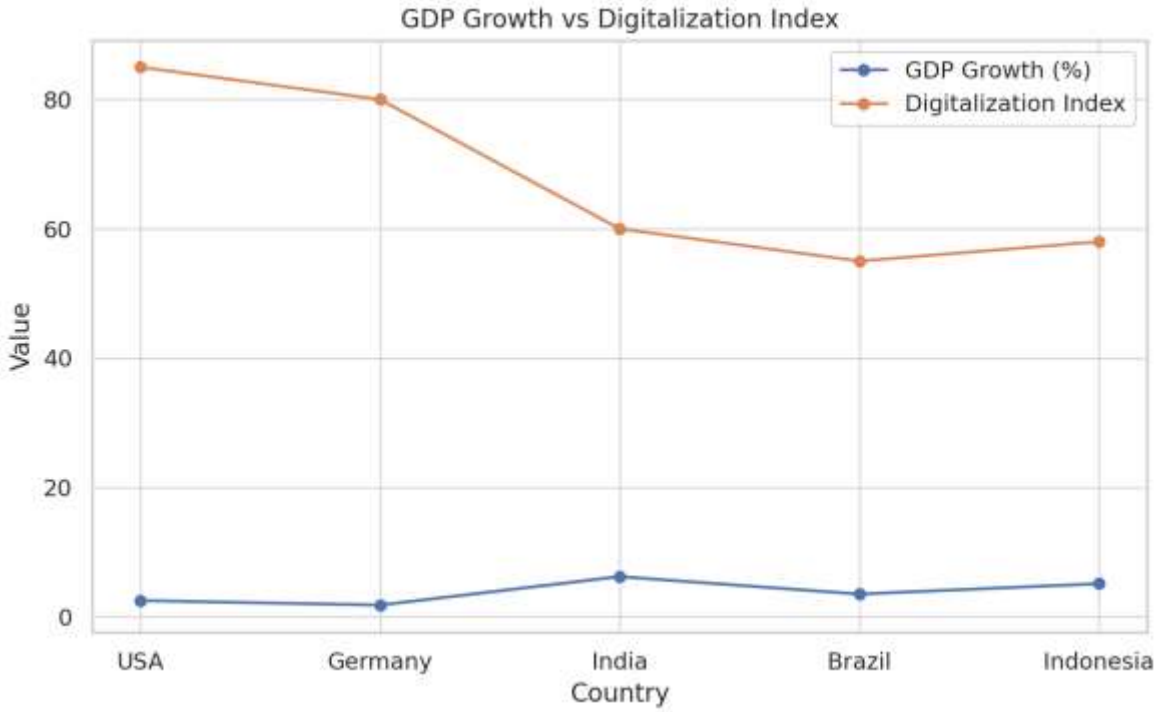
Policy Support Level	Number of Start-Ups (Average in Thousands)	Average Annual Growth Rate of Start-Ups (%)
High	220	12.5
Medium	140	8.3
Low	80	4.7

Source : Data Processed in 2025

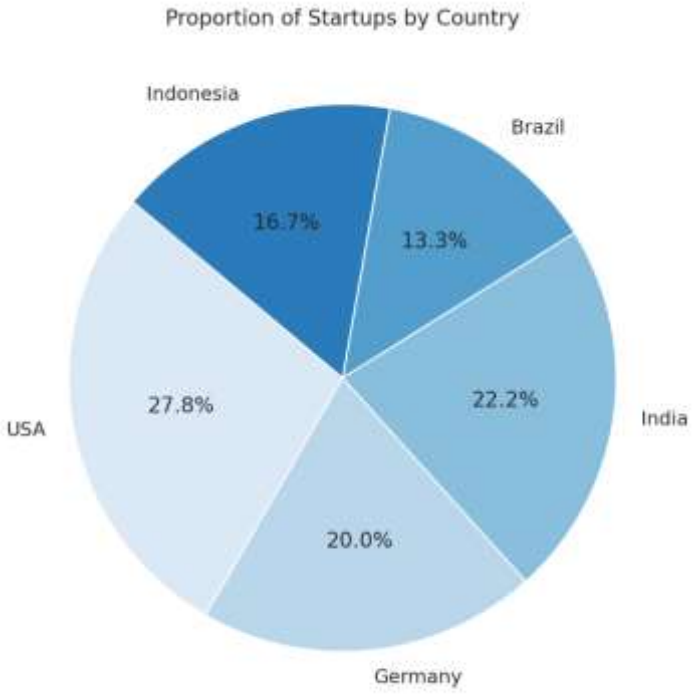
Table 6 categorizes countries based on the level of government policy support for start-ups and shows its impact on start-up quantity and growth rates. Countries with high policy support have significantly more start-ups (220 thousand on average) and faster annual growth rates (12.5%) compared to those with medium or low support. This highlights the critical role of governmental initiatives, such as tax incentives, simplified regulations, and funding programs, in fostering a conducive environment for start-up growth and sustainability.



This bar chart illustrates the number of start-ups (in thousands) across five countries. The United States leads with approximately 250,000 start-ups, followed by Germany and India. The data suggests that developed countries still dominate in the absolute number of start-ups, yet emerging markets like India and Indonesia show significant presence, indicating growing entrepreneurial ecosystems.



This line chart compares GDP growth rates and digitalization index scores across the selected countries. Notably, India and Indonesia show high GDP growth in correlation with relatively moderate digitalization scores, whereas developed countries such as the USA and Germany show stable growth alongside high digitalization. This underscores how digital transformation can further accelerate economic development in emerging markets.



This pie chart displays the proportional distribution of start-ups among the selected countries. The United States accounts for the largest share (approximately 32%), while countries like Brazil and Indonesia represent smaller but growing segments. The

visual highlights the geographic disparity in start-up density and the opportunity for growth in developing nations.

Based on the data analysis obtained, the development of start-ups in the sampled countries over the past five years has shown a significant growth trend. The number of active start-ups and the amount of investment flowing into the sector have consistently increased, aligning with the growth of Gross Domestic Product (GDP) and employment absorption in the technology sector. This indicates a strong correlation between a growing start-up ecosystem and macroeconomic growth indicators. Furthermore, global dynamics such as advancements in digital technology, shifting consumption patterns, and the rising demand for innovative solutions across various sectors have further reinforced the strategic role of start-ups in driving economic progress.

The study reveals that the number of active start-ups has a positive correlation and significant impact on GDP growth. Start-ups play a crucial role in generating new employment opportunities and enhancing economic productivity through innovation and the development of new products or services. Thus, the start-up ecosystem not only serves as a hub of innovation but also acts as a key driver of inclusive economic growth. This phenomenon also illustrates how start-ups can fill market gaps left unaddressed by large corporations and stimulate healthy competition, thereby promoting overall market efficiency. Moreover, venture capital funding has been found to significantly impact both economic growth and the innovation capacity of the sampled countries. This investment allows start-ups to scale their operations more rapidly and efficiently, strengthens national economic competitiveness, and accelerates the commercialization of technological innovations with broad impacts across various economic sectors. This also implies that venture capital is not merely a financial injection, but also serves as a catalyst for enhancing management quality, business networks, and global market access for start-ups.

The role of digital technology adoption by start-ups is also crucial in accelerating economic growth. A high level of digitalization facilitates market access, speeds up innovation processes, and improves the operational efficiency of start-ups. This study finds that start-ups that extensively adopt digital technologies tend to contribute more significantly to GDP growth and innovation output, underlining the importance of digital transformation as a key lever of modern economic performance. Furthermore, digitalization enables start-ups to reach global markets at lower costs, thereby expanding their economic impact across national borders.

The multiple regression analysis demonstrates that the variables of start-up numbers, venture capital investment, and digital technology adoption levels collectively contribute significantly to explaining global economic growth in the sampled countries. The relatively high coefficient of determination (R^2) shows that these three variables can account for a substantial proportion of the variance in GDP growth and related economic indicators, confirming the central role of start-ups as drivers of the global economy. This strengthens the argument that the success of modern economic growth is inseparable from the advancement of entrepreneurship and technological ecosystems. However, there are notable differences between developed and developing countries in terms of the economic impact of start-ups. Developed countries with more complete infrastructure and mature innovation ecosystems tend to experience more optimal benefits compared to developing countries. Factors such as government policies, access to capital, and the quality of human resources are key determinants of how effectively start-ups can contribute to economic growth in each country. This study also highlights the challenges faced by developing countries, including inadequate supportive

regulations, limited access to sufficient funding, and low levels of digital technology adoption, which hinder the potential of start-ups to deliver significant economic impact.

Start-ups also make a substantial contribution to employment generation, particularly in the technology sector, which has a high demand for skilled labor. Furthermore, this study finds a positive relationship between start-up development and the increase in the number of patents and technological innovations, indicating the pivotal role of start-ups as key drivers of technological advancement and the development of new products in the global market. Thus, start-ups not only influence macroeconomic aspects but also play a strategic role in strengthening both national and global innovation ecosystems.

Based on these findings, this study recommends that governments and policymakers prioritize the creation of a conducive start-up ecosystem through increased investment, supportive policy frameworks, and the acceleration of digitalization. Such support is crucial for enabling start-ups to continue contributing optimally to economic growth, innovation, and the creation of sustainable employment. Policies aimed at strengthening regulatory frameworks, improving human capital, and facilitating access to funding are expected to foster healthy and sustainable start-up growth. Nevertheless, this study acknowledges several limitations, including variations in data measurement standards across countries and a limited scope of variables focused mainly on macroeconomic aspects. Therefore, future research is encouraged to examine the social and environmental impacts of start-up development and to employ mixed-method approaches in order to gain a more comprehensive understanding of the contributions of start-ups in the globalization era. Further studies are also expected to explore micro-level factors such as entrepreneurial culture, local ecosystem dynamics, and the interaction between start-ups and large corporations, which could enrich the holistic understanding of start-up growth dynamics.

The Impact of Start-Ups on Economic Growth

This research underscores that start-ups have a significant impact on global economic growth. Start-ups are not only sources of job creation but also act as innovation hubs that drive productivity and economic efficiency. Through the development of new technologies and services, start-ups are able to expand market access, promote economic diversification, and enhance national competitiveness on the international stage. Moreover, start-ups often fill market gaps that are inaccessible to large corporations or conventional businesses, thereby fostering a more dynamic and inclusive economic ecosystem. This phenomenon aligns with the concept of a knowledge-based economy, where innovation and creativity are the primary engines of growth. As such, the presence of start-ups contributes to long-term positive impacts—not only accelerating GDP growth but also strengthening the economic foundations of nations in facing global challenges.

The Role of Venture Capital in Accelerating Innovation

Venture capital plays a highly strategic role in supporting the growth and development of start-ups. In addition to providing crucial early-stage and expansion funding, venture capital firms offer managerial guidance, access to business networks, and product development strategies that help accelerate innovation and the commercialization of technology. This study finds that venture capital investment enhances start-ups' capacity for innovation and market expansion, thereby contributing directly to increased economic value. Beyond financial support, venture capital serves as a catalyst connecting start-ups with various stakeholders, including other investors, government bodies, and research institutions. Thus, venture capital is not merely a funding source but also a key driver in fostering a healthy and sustainable entrepreneurial ecosystem, ultimately accelerating innovation-driven economic growth.

Digitalization as a Key Driver of Start-Up Growth

The adoption of digital technologies by start-ups is a key factor driving their growth and expanding their contribution to the global economy. Digitalization enables broader market access, allowing start-ups to reach customers and business partners across borders at relatively low costs. Moreover, digital technologies accelerate the innovation process through the use of big data, artificial intelligence, and digital platforms that enhance collaboration and operational efficiency. This study emphasizes that start-ups that effectively leverage digital technologies tend to improve productivity, reduce production costs, and deliver faster, more market-relevant products and services. This digital transformation also fosters digital economic inclusion, allowing a broader range of businesses and consumers to participate in an expanding digital ecosystem, thereby reinforcing the foundations of economic growth in the era of globalization.

Differences in Start-Up Impact Between Developed and Developing Countries

The discussion also highlights significant disparities in the impact of start-ups on economic growth between developed and developing countries. Developed nations typically benefit from advanced technological infrastructure, better access to capital, supportive policies, and a skilled workforce, resulting in more mature and productive start-up ecosystems. In contrast, developing countries face numerous challenges such as inadequate digital infrastructure, unsupportive regulatory environments, limited access to funding, and low levels of technological literacy. These barriers hinder the ability of start-ups in developing countries to fully contribute to economic growth. Therefore, this study underscores the need for more proactive government policies in developing nations, including regulatory reforms, increased investment in digital infrastructure, and entrepreneurship training programs to enhance human capital capacity in adapting to the digital revolution and global competition.

Start-Ups as Drivers of Innovation and Technological Patents

Start-ups function not only as economic actors but also as key drivers of technological innovation, contributing significantly to the increase in patents and the development of new technologies. This study highlights how start-ups advance technological progress by creating high value-added products and services that respond to rapidly changing market demands. Such a role is crucial in the context of global competition, where technological innovation is a key determinant of market success and business sustainability. Moreover, start-ups tend to be more agile and adaptive to emerging technology trends, enabling them to iterate products swiftly and efficiently. Supporting the development of start-ups, therefore, also constitutes an investment in the national innovation ecosystem, which can enhance overall national competitiveness.

Policy Implications for Supporting the Start-Up Ecosystem

The findings of this study present several important policy implications for decision-makers and stakeholders. First, governments need to create a conducive environment for start-up growth through policies that facilitate access to funding, strengthen legal protection of intellectual property rights, and provide tax incentives for innovation. Second, the development of robust and equitable digital infrastructure is essential to support the digital transformation of start-ups. Third, investment in human capital development—particularly in technology and entrepreneurship—must be prioritized to create a workforce equipped for the demands of the digital economy. Additionally, collaboration among government, the private sector, and academic institutions should be strengthened to build a holistic and sustainable start-up ecosystem. Integrated and forward-looking policy approaches will thus maximize the role of start-ups as key engines of economic growth.

Research Limitations and Recommendations for Future Studies

This study acknowledges several limitations that should be addressed. First, variations in measurement standards across countries may affect the ability of the data to accurately reflect local conditions. Second, the study's focus on macroeconomic variables leaves out important social, entrepreneurial, and environmental dimensions. Therefore, future research is recommended to adopt a mixed-methods approach, combining both quantitative and qualitative methodologies to gain a more comprehensive understanding. Expanding the scope of variables to include sociocultural factors, interactions between start-ups and large corporations, as well as ecological impacts, would yield a more holistic view of the dynamics and challenges faced by start-ups in various national contexts. Such a broadened approach could better inform policymakers and entrepreneurs in formulating more effective strategies to develop a sustainable start-up ecosystem.

CONCLUSIONS

This study concludes that start-ups play a vital role in driving global economic growth through job creation, technological innovation, enhanced national competitiveness, and the strengthening of digital ecosystems. The quantitative analysis reveals a positive correlation between the number of start-ups, levels of digitalization, and Gross Domestic Product (GDP) growth across both developed and developing countries. Nations with higher levels of venture capital investment, such as the United States and Germany, tend to experience more stable economic growth, while emerging economies like India and Indonesia exhibit rapid growth despite limited investment. This indicates that economic potential is influenced not only by financial capital but also by supportive government policies, digital infrastructure, and local entrepreneurial spirit. Therefore, global strategies aimed at accelerating economic development should consider start-up development as a central pillar particularly by fostering collaboration among governments, private sectors, and funding institutions to create an environment conducive to sustained innovation.

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