Impact of Technopreneurs on National Economic Development

By

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Abstract

This research investigates the role of technopreneurs in driving national economic development. Specifically, it evaluates how both technology-based and innovative entrepreneurs contribute to sustainable economic growth. The study utilized a survey design, applying a structured questionnaire built on a five-point Likert scale. A sample size of 335 respondents was determined using Krejcie and Morgan's sample size table. Data analysis was conducted through the Partial Least Squares–Structural Equation Modelling (PLS-SEM) approach, where the measurement model assessed validity and reliability, while the structural model tested hypotheses. Results revealed a statistically significant and positive relationship between innovative entrepreneurship and economic development, as well as between technology entrepreneurship and economic development. The study concludes that fostering innovation and technology-oriented entrepreneurship is critical to achieving long-term economic growth. It recommends that governments and institutions support innovation ecosystems by creating innovation hubs, incubators, and collaborative networks involving entrepreneurs, universities, and research centers. Additionally, investment in digital infrastructure, particularly the provision of high-speed internet and access to modern technologies in underserved regions, is strongly advised.

Keywords: Technopreneurs, Innovation, Technology, Entrepreneurs, Economic Development

1.1 Introduction

Rapid technological advancement has reshaped global economies and given rise to a new class of entrepreneurs who combine conventional business expertise with deep knowledge of technology and innovation. These technopreneurs and innovative entrepreneurs are central to promoting economic growth (Zaki et al., 2021). Technopreneurs harness technology-based solutions to create new business opportunities, while innovative entrepreneurs introduce disruptive approaches that enhance productivity and competitiveness. Innovation, in this context, entails implementing a new or significantly improved product, service, process, or organizational practice.

Technopreneurship blends technology with entrepreneurship, describing individuals who exploit technological progress to design novel products, services, or business models. Such entrepreneurs are adept at identifying market gaps and applying technology to address them creatively (Singh et al., 2022). With innovation at its core, technopreneurship is characterized by a drive to challenge existing systems and transform industries through technology. These entrepreneurs embrace change, treat challenges as opportunities, and generate value through pioneering products and services that have revolutionized sectors such as finance, health, transportation, and communication.

Innovative entrepreneurship, on the other hand, involves introducing and applying new ideas, products, services, or models that disrupt industries and drive growth. Unlike traditional entrepreneurs who often replicate existing ventures, innovative entrepreneurs design unique solutions that address unmet needs and improve efficiency. They embrace risk-taking, utilize advanced technologies, and consistently refine their innovations to remain competitive. Through creativity and technological progress, they generate jobs, raise productivity, and support national development. Innovative ventures either provide new goods and services or employ fresh methods to deliver existing ones more cost-effectively. Such innovation-driven enterprises have been shown to produce greater economic impact across many regions of the world (Amini et al., 2022).

National economic development refers to steady improvements in a nation's economy, reflected in better living standards, expanded employment opportunities, and enhanced societal welfare. It includes industrial expansion, infrastructure growth, and technological progress that enhance stability and productivity. According to Amri and Sihotang (2023), key indicators of development include GDP growth, income distribution, poverty alleviation, education access, and healthcare availability. Governments play a central role by formulating policies that encourage investment, entrepreneurship, and innovation. A strong economy attracts foreign investors, generates employment, and boosts international competitiveness. Ultimately, national economic development improves quality of life, reduces inequality, and ensures long-term prosperity.

Combining technology and innovation as core variables in measuring technopreneurship creates a comprehensive framework for understanding its influence on industrial and economic transformation (Kahpi et al., 2024). Technology provides the foundation for new business models, while innovation applies this foundation creatively to produce groundbreaking solutions. Together, these elements enhance productivity, disrupt conventional industries, and drive sustainable economic growth. Their synergy fosters competitiveness and ensures adaptability to evolving market conditions, positioning technopreneurship as a vital engine of contemporary economic development. This study therefore seeks to examine how these entrepreneurial activities contribute to national economic growth.

1.2 Statement of the Problem

Technopreneurs, who are at the forefront of innovation and technological advancement, have the capacity to reshape national economies by developing new business models, boosting productivity, and supporting growth. Despite their rising significance, the precise extent of their impact on crucial economic indicators such as GDP expansion, job creation, and industrial transformation has not been sufficiently clarified. Although innovation and technology serve as the backbone of technopreneurship, empirical studies quantifying their influence on economic development are limited. Furthermore, obstacles including poor infrastructure, restricted funding opportunities, and weak government backing prevent technopreneurs from reaching their full potential. This study therefore seeks to examine the impact of technopreneurship—measured through technology and innovation—on national economic development, with the goal of providing practical insights and policy directions to build a more enabling environment for technopreneurs.

1.3 Research Questions

Arising from the issues highlighted above, this study seeks to answer the following questions:

1. In what ways do technology entrepreneurs contribute to national economic development?
2. How do innovative entrepreneurs enhance national economic development?

1.4 Research Objectives

This study is guided by the following objectives:

1. To evaluate the role of technology entrepreneurs in national economic development.
2. To investigate the contributions of innovative entrepreneurs to national economic development.

1.5 Research Hypotheses

H_{01}: Technology entrepreneurs have no significant positive effect on national economic development.

H_{02}: Innovative entrepreneurs have no significant positive effect on national economic development.

Literature Review

Concept of Technopreneurship

The term *technopreneurship* combines "technology" and "entrepreneurship." Just as technology is vital for economic advancement, so too is entrepreneurship (Masenya, 2021). Entrepreneurship involves organizing production resources, assuming risks, and combining factors of production to create value and profit. With the technological revolution of the third industrial revolution and the far-reaching influence of digital innovations in the fourth, technology and entrepreneurship have become inseparable, giving rise to technopreneurship.

Different scholars describe it using terms like "technology-based entrepreneurs," "high-technology entrepreneurs," or "high-tech ventures," referring to businesses that merge entrepreneurial ability with technology (Chinenye & Onuoha, 2022; Isa et al., 2024; Renko et al., 2002). Research by Osademe et al. (2023) and Machmud et al. (2022) stresses that technopreneurship emerges when individuals combine technical expertise with entrepreneurial skills to design and commercialize innovations. Unlike conventional entrepreneurship, technopreneurship places technology and innovation at its core, enabling entrepreneurs to disrupt markets, create jobs, and significantly contribute to economic development.

Technology

Technology refers to the structured knowledge, methods, and tools humans employ to manipulate their environment and meet needs. It can also be understood as the systematic application of scientific and socio-cultural knowledge to solve problems and enhance living conditions (Ojikutu et al., 2023). Across industries, technology is increasingly deployed to disrupt existing business practices, develop new solutions, and promote sustainability (Neligan et al., 2023).

Broadly, technology encompasses both mechanical and digital tools, systems, or devices that support or replace human effort. It has transformed business operations, allowing small firms to compete with larger corporations. Companies leverage technologies ranging from mobile devices to cloud systems to gain competitive advantage (Denga et al., 2022). Consumer perceptions and purchasing patterns have also been reshaped by technological change, even though many remain unaware of the extent to which emerging technologies shape product development, manufacturing, and distribution (Adiningrat & Warda, 2023).

Kurniawati (2022) notes that technology significantly influences business growth and performance in areas such as convenience, cost reduction, enhanced functionality, improved

learning and marketing, instant communication, better customer service, higher productivity, and overall efficiency.

Innovation

Ferlito and Faraci (2022) define innovation as the development and commercialization of new ideas, processes, or methods that sustain business competitiveness. It encompasses activities such as research, new product or service development, process improvement, and business expansion (Suherlan, 2023). Innovation represents creative initiatives in designing or refining products and services, ensuring that businesses adapt and satisfy customer demands.

Innovation can be described as introducing a product or process significantly different from previous ones, made available to users (product) or applied internally (process) (Rammer, 2022). Effective innovation requires strong awareness of markets and user needs to guide product development. Its main aim is to sustain competitiveness by creating improved or upgraded offerings (Oyedele & Oyero, 2022). Innovation increases productivity, profitability, and growth, giving firms a competitive edge. It also allows organizations to anticipate customer needs and market trends.

Collaborations between research institutions, universities, incubators, and businesses are essential for building innovation ecosystems in developing economies (Rafiana, 2024). Such partnerships enhance competition, stimulate continuous learning, and strengthen development.

National Economic Development

National economic development is the steady improvement of a country's economy, measured by increased productivity, industrial diversification, job creation, rising living standards, and equitable distribution of wealth. It often extends beyond economic factors to encompass social and political changes aimed at enhancing citizens' quality of life. Governments seek to achieve stability, full employment, and sustainable growth through fiscal and monetary policies, trade regulations, and tax strategies (Gong et al., 2023).

The term *national economy* covers all economic activities within a country, including production, distribution, and consumption of goods and services, both domestically and internationally. It is evaluated using indicators such as GDP, inflation, unemployment, and trade balance. Multiple factors—such as government policies, market dynamics, technology, natural resources, and global trade—shape national economies. Through policy interventions,

governments attempt to stabilize inflation, boost growth, and reduce unemployment while ensuring long-term prosperity.

Theoretical Review

This study is anchored on **Schumpeter's Theory of Innovation and Creative Destruction**. The theory posits that innovation is the primary force through which entrepreneurs drive economic development by reshaping existing markets with new products, services, or business models. Technopreneurs, who merge technological expertise with entrepreneurial skills, embody this concept by introducing innovations that disrupt and transform industries, thereby stimulating economic progress. Through the adoption of breakthrough technologies and innovative practices, technopreneurs contribute to the creation of new industries, employment opportunities, and overall economic expansion. Schumpeter's framework thus provides a solid foundation for explaining the critical role of technopreneurs in shaping contemporary economies.

Empirical Review

Nanda (2023): Conducted a study in Indonesia on "Technopreneurship Strategy to Grow Entrepreneurship Career Options for Students in Higher Education." The research involved reviewing and analyzing 28 journal articles, which were summarized in tabular form. It revealed a gap between students' knowledge and the skills required for technopreneurship across disciplines. The study found that integrating entrepreneurship education and incubator-based technopreneurial training into higher education curricula significantly shapes students' character and mindset toward becoming technopreneurs.

Oyedele et al. (2019): Investigated the influence of technopreneurship on the performance of agro-businesses in Abeokuta, Ogun State, Nigeria. Using a survey and quantitative research design, the researchers applied Yamane's formula to select 126 respondents out of 183 agro-businesses, achieving a 74% response rate. Data were gathered with a structured questionnaire and analyzed with linear regression via SPSS (version 20). Results demonstrated that technological innovation positively affects competitiveness and that technological opportunities strongly enhance operational efficiency.

Odeyemi (2023): Examined "Leveraging Innovation and Technological Entrepreneurship in Achieving Economic Growth in Nigeria." The study, based on a qualitative review method, assessed the landscape of technological entrepreneurship in Nigeria, identifying barriers such as limited infrastructure, policy challenges, and funding gaps. It further analyzed government initiatives and global best practices to highlight opportunities and strategies for fostering technopreneurship in Nigeria.

Oyedele et al. (2020): Explored technopreneurship as a means of ensuring sustainable performance in Nigerian SMEs. The research, carried out in selected parts of Abeokuta, adopted a survey method. A sample of 126 respondents was selected using Taro Yamane's formula and random sampling. Data collected through structured questionnaires were analyzed using linear regression. Findings showed that intellectual property rights significantly influence profitability, while research and development, along with innovation, directly and positively affect business revenues.

Maragita (2024): Studied the role of technopreneurs in addressing global sustainability challenges using a mental accounting perspective. Employing a literature review approach, the study demonstrated that innovation and eco-friendly technologies help solve waste problems and increase efficiency. Social media and e-commerce were also found to enhance market reach at minimal cost. Mental accounting was shown to influence resource allocation, adoption of digital tools, innovation, and risk management.

Overall, the reviewed works highlight a positive relationship between technopreneurship and economic or business performance. However, inconsistencies in findings and methodological differences reveal gaps in the literature, which this study aims to address by applying a distinct methodological approach.

Research Methodology

Research Design

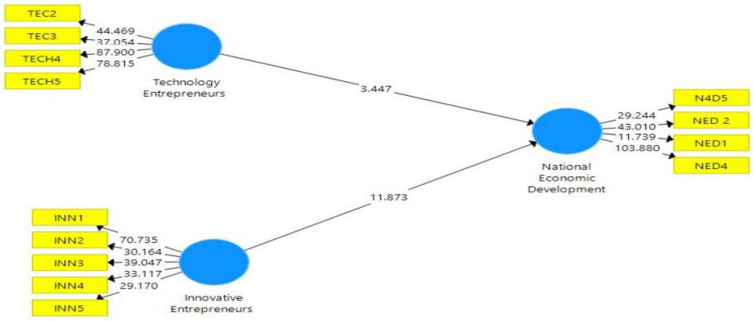
This study adopted a **survey research design**, relying on primary data collected directly from the field. The research was conducted in Nigeria, with a particular focus on Zamfara State, which, according to the National Population Commission (2022), has a population of 216,783,400. The sample size of 335 respondents was determined using the Krejcie and Morgan sample size determination table.

Data collection was carried out through the administration of structured questionnaires designed on a five-point Likert scale. The response options included: *Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1).*

Data analysis employed the **Partial Least Squares–Structural Equation Modelling (PLS-SEM)** technique. The analysis was conducted in two stages:

1. **Measurement Model:** Used to evaluate the reliability and validity of the constructs.
2. **Structural Model:** Applied to test the research hypotheses.

Structural Model



Source; SmartPLS output 2025

Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Innovative Entrepreneurs	**0.926**	**0.931**	**0.944**	**0.772**
National Economic Development	**0.871**	**0.896**	**0.914**	**0.728**
Technology Entrepreneurs	**0.917**	**0.933**	**0.941**	**0.799**

Source; SmartPLS output 2025.

Reliability Analysis (Measurement Consistency)

The values of Cronbach's Alpha and Composite Reliability (CR) for all three constructs were found to be above 0.9, which demonstrates a very high level of reliability. This indicates that the items grouped under each construct are strongly correlated and consistently measure the same concept. Additionally, the rho_A values, ranging between 0.896 and 0.933, provide further evidence of strong internal consistency. This stability implies that repeating the measurement under similar conditions would likely yield comparable outcomes.

Convergent Validity Analysis (Representation of Constructs)

The Average Variance Extracted (AVE) values for each construct exceeded 0.7, surpassing the minimum acceptable benchmark of 0.5. This result suggests that the constructs explain a substantial proportion of variance in their indicators, confirming strong convergent validity. In other words, the constructs are clearly defined and effectively capture the concepts they were designed to measure.

Overall, the strong reliability and validity outcomes confirm that the constructs—Technology Entrepreneurs, Innovative Entrepreneurs, and National Economic Development—were accurately measured, ensuring trustworthy findings. These results reinforce the argument that technopreneurs play a critical role in economic advancement, particularly through innovation-driven activities. With such evidence, policymakers and business leaders are better positioned to direct investments into technopreneurship as a driver of national development, emphasizing initiatives such as startup funding, digital infrastructure improvements, and innovation-oriented policies. The findings thus provide a solid foundation for economic strategies anchored on technology-driven entrepreneurship, highlighting its importance in promoting sustainable growth.

R Square

	R Square	R Square Adjusted
National Economic Development	0.852	0.848

Source; SmartPLS output 2025

R-Square Analysis

The R Square (R^2) value of 0.852 for National Economic Development shows that 85.2% of the variation in the dependent variable is explained by the independent variables. This reflects strong explanatory power, suggesting that the model effectively identifies the key factors influencing economic development.

The Adjusted R Square value of 0.848 adjusts for the number of predictors in the model, helping to prevent overfitting. Its closeness to the R^2 value further indicates that the model is both stable and generalizable, even if additional predictors were considered.

The high R^2 result demonstrates that the independent variables—Technology Entrepreneurs and Innovative Entrepreneurs—are strong predictors of National Economic Development. This confirms that technopreneurs make a significant contribution to economic growth. The Adjusted R^2 value (0.848) reinforces the model's reliability, ensuring that the strength of the relationship is not exaggerated by the number of variables included.

These findings suggest that policymakers and business leaders can confidently promote technopreneurship through targeted initiatives such as funding programs, innovation-driven policies, and startup support systems, all of which are likely to accelerate economic progress.

Parth Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Innovative Entrepreneurs -> National Economic Development	1.309	1.293	0.110	11.873	**0.000**
Technology Entrepreneurs -> National Economic Development	1.436	1.420	0.126	11.447	**0.001**

Source; SmartPLS output 2025

Path Coefficients

The **Original Sample (O) value** of 1.309 shows a positive link between Innovative Entrepreneurs and National Economic Development. This indicates that as the number of innovative entrepreneurs grows, national economic development also improves. The **Sample Mean (M) value** of 1.293, which is close to the original sample, demonstrates stability in the results. The **Standard Deviation (STDEV) of 0.110** reflects very little variation across the resampled data, further supporting reliability. A **T-Statistic of 11.873**, well above the 1.96 benchmark, confirms the relationship is statistically significant and not due to chance. The **P-value of 0.000**, which is below the 0.05 threshold, leads to the rejection of the null hypothesis and confirms that innovative entrepreneurship has a significant positive effect on economic development.

Similarly, the **Original Sample (O) value** of 1.436 indicates a strong positive association between Technology Entrepreneurs and National Economic Development. This means that higher participation of technology entrepreneurs contributes to improved national economic performance. The **Sample Mean (M) of 1.420**, close to the original sample, shows stability across repeated samples. The **STDEV of 0.126** suggests a slightly larger variation than that of innovative entrepreneurs, but it still reflects reliability. A **T-Statistic of 11.447**, higher than the 1.96 cutoff, confirms statistical significance. The **P-value of 0.001**, well below 0.05, provides strong evidence of a significant positive relationship between technology entrepreneurship and national economic development.

Discussion of Findings

The results of the study demonstrate that both innovative and technology entrepreneurs significantly and positively influence national economic development. Specifically, innovative entrepreneurship exhibits a strong relationship with economic growth,

emphasizing its role in boosting productivity, generating jobs, and advancing technology. This implies that countries investing in research and development (R&D), business incubation programs, and intellectual property rights are more likely to achieve sustainable growth. These outcomes are consistent with earlier studies such as Xiao et al. (2022), Pan et al. (2024), and Botelho et al. (2021), which highlight how innovation fosters new industries, competitiveness, and wealth creation.

Technology entrepreneurs also show a significant positive contribution to economic development, confirming that technology-driven businesses play an essential role in economic transformation. Their impact points to the importance of investment in digital infrastructure, funding access, and supportive regulatory policies. These findings align with the works of Usman et al. (2024) and Stephenson et al. (2021), which demonstrate that technology-based enterprises drive economic change through digital innovation, automation, and the creation of high-value employment opportunities.

For long-term growth, it is crucial for policymakers to ensure that technology and innovation are made inclusive and aligned with national priorities. Collectively, the findings highlight that both innovative and technology entrepreneurship are indispensable for sustainable development, competitiveness, and prosperity.

Conclusion

The study concludes that **Innovative Entrepreneurs** and **Technology Entrepreneurs** each have a positive and statistically significant effect on National Economic Development. For innovative entrepreneurs, the T-Statistic of 11.873 and P-value of 0.000 confirm their strong contribution to national growth through improved productivity, job creation, and technological progress.

Technology entrepreneurs also display a significant impact, with a T-Statistic of 11.447 and P-value of 0.001. Though slightly less pronounced compared to innovation-driven entrepreneurship, their influence remains important, contributing through new technologies, digital jobs, and efficiency gains.

Overall, both innovative and technology entrepreneurship are recognized as key drivers of economic development. These findings stress the importance of fostering entrepreneurial activities rooted in innovation and technology to support sustainable economic growth.

Recommendations

Based on the conclusions of the study, several recommendations are put forward. For innovative entrepreneurs, governments and institutions should prioritize the development of innovation ecosystems by establishing hubs, incubators, and fostering collaborations between entrepreneurs, research centers, and universities. In addition, adequate funding support in the form of grants, tax incentives, and subsidies for research and development (R&D) projects is essential to encourage creativity and groundbreaking initiatives. Entrepreneurship education should also be fully integrated at all academic levels to prepare future entrepreneurs with the necessary skills to transform ideas into marketable products. Furthermore, strengthening intellectual property protection is vital to safeguard innovations and promote a dynamic entrepreneurial environment where innovators feel secure in advancing their work.

For technology entrepreneurs, significant investment in digital infrastructure is crucial to ensure access to reliable high-speed internet and modern technology, particularly in underserved areas. Partnerships between startups and established technology firms should be encouraged to provide mentorship and resources that help smaller firms scale more effectively. Governments and financial institutions should also establish venture capital programs to provide financial support for early-stage technology businesses. Additionally, simplifying regulatory frameworks and introducing tax incentives can create a more favorable environment for the growth of technology-driven enterprises.

By supporting both innovative and technology entrepreneurs through these measures, governments can stimulate sustainable economic growth, foster job creation, and strengthen national competitiveness in the global economy.

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