

ENTREPRENEURIAL FRAMEWORK CONDITIONS AND ECONOMIC GROWTH: INSIGHTS FROM MIDDLE-INCOME ECONOMIES

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ABSTRACT

This article implements correlation analysis and a fixed effects model to assess the influence of entrepreneurial framework conditions (EFCs) on economic growth in middle-income countries. The implemented panel data set for EFCs is unearthed from the Global Entrepreneurship Monitor website and that for gross domestic product (GDP) per capita, a surrogate for economic growth, is extracted from the World Bank website over the observation period 2001 – 2021. We have discovered that there are statistically significant positive correlations between GDP per capita and ‘entrepreneurial finance’ and ‘post-school entrepreneurial education and training’, and statistically significant negative correlations between GDP per capita and ‘taxes and bureaucracy’, ‘internal market openness’, and ‘physical and service infrastructure’. Moreover, we have exposed that EFCs positively and significantly impact economic growth in middle-income countries. This article contributes to the discourse on the connection between economic growth and conditions for entrepreneurship in middle-income economies. As a recommendation, policymakers should consider EFCs when developing policies to kindle economic growth in middle-income economies. Further, the study results could assist policymakers in selecting and applying suitable measures to eradicate the impediments in the businesses where entrepreneurs operate.

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1. INTRODUCTION

Economic growth is a crucial objective to be achieved by both developing and developed countries. Nonetheless, countries face a big challenge to stimulate economic growth after the Great Depression (i.e. the 2007 – 2009 global crisis) and the COVID-19 pandemic. They continue to feel the economic effects of the Great Depression and the COVID-19 pandemic. Their recovery has been slow. The COVID-19 pandemic activated the severest downturn in the world economy since the 2007 - 2009 crisis ([International Monetary Fund, 2022](#)). Against this backdrop, the critical issue is how economies can stimulate economic growth. In practice, a multiplicity of frameworks, strategies, and policies has been designed to stimulate economic growth in developing and developed countries. Nevertheless, economies face a problem of recognising the determinants of economic development and growth ([Stoica, Roman & Rusu, 2020](#)).

Interestingly, existing literature indicated that entrepreneurship is one of the key drivers of economic development and growth ([Matenda & Sibanda, 2023a](#); [Matenda & Sibanda, 2023](#); [Matenda & Sibanda, 2022](#); [Gomes et al., 2022](#); [Nwagu & Enofe, 2021](#); [Stoica, Roman & Rusu, 2020](#); [Urbano & Aparicio 2016](#)). It influences economic growth in a number of ways, such as, job creation, knowledge spillovers, and innovation promotion ([Wang & Shao, 2023](#); [Vatavu et al., 2021](#); [Stoica, Roman & Rusu, 2020](#); [Savrul, 2017](#)). Therefore, in reality, the role of entrepreneurship cannot be ignored. [Gomes et al. \(2022\)](#) propounded that the influence of entrepreneurship on economic growth is a topic that is under continuous scrutiny and, due to endless changes as a result of globalisation, it is regarded as one of the apposite studies. Nevertheless, several authors indicated that not every entrepreneurship results in growth (see, for instance, [Gomes et al., 2022](#); [Xu, Yu & Li, 2021](#); [Dvoulety, Gordievskaya & Prochazka, 2018](#); [Naude, 2013](#)), since regions and countries are associated with diverse entrepreneurial behaviour and attitudes, entrepreneurial framework conditions (EFCs), and there are varied classes of entrepreneurship ([Stoica, Roman & Rusu, 2020](#); [Acs et al., 2018](#); [Stam & Van Stel, 2011, 2009](#)). Entrepreneurial attitudes and behaviour denote the behaviour and attitudes of individuals regarding entrepreneurship and EFCs signify contextual issues of the economic atmosphere ([Matenda & Sibanda, 2023a](#)). [Bosma et al. \(2008\)](#) pronounced that EFCs are ‘the necessary oxygen of resources, incentives, markets, and supporting institutions to the growth of new firms’. The interdependence of contextual variables of the economic atmosphere, the entrepreneur and the entrepreneurial venture is referred to as the entrepreneurship ecosystem ([Gomes, Ferreira & Lopes, 2023](#); [Steigertahl & Mauer, 2023](#); [Pita, Costa & Moreira, 2021a](#); and references therein). [Stam & Spigel \(2016\)](#) specified that an entrepreneurial ecosystem is ‘a set of

interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory'. Moreover, some studies (see, for instance, Urbano & Aparicio, 2016; Van Stel, Carree & Thurik, 2005) indicated that the association between entrepreneurship and economic growth cannot be well-defined except when particular circumstances are encountered. This indicates that, in the extant literature, there is no harmony on the influence of entrepreneurship on economic growth. Therefore, understanding the association between entrepreneurship and economic growth still needs clarification.

Xu, Yu & Li (2021) postulated that numerous research articles revealing that entrepreneurship drives economic growth are usually directed toward advanced countries and regions. Under the same line of reasoning, Cao & Shi (2021) indicated that entrepreneurial ecosystem research has been essentially static and theoretical, and has stereotypically devoted to advanced economies. In developing nations, entrepreneurship and entrepreneurial ecosystem are basically poorly researched. Since advanced and developing economies are dissimilar (Gomes et al., 2022; Cao & Shi, 2021; Crowley & McCann, 2018; Roundy, 2017), results found in advanced economies do not reflect a true depiction of what is the state of affairs in unadvanced economies (see, for example, Cao & Shi, 2021). Some studies indicated that there are significant variations in the determinants of economic growth in developing and advanced countries (Farinha, Ferreira & Nunes, 2018; Valliere & Peterson, 2009).

Existing literature has also indicated that several studies have assessed the impact of entrepreneurship on economic growth at the industry or firm stage and that studies that examined the connection between economic growth and entrepreneurship at the economy level are generally limited (see, for instance, Munyo & Veiga, 2022; Savrul, 2017; Acs, Autio & Szerb, 2014). One of the reasons is the problem of measuring and defining entrepreneurship (see Gomes & Ferreira, 2022; Wong, Ho & Autio, 2005). Therefore, Farinha et al. (2020) and Stoica, Roman & Rusu (2020) opined that further studies with massive and more diverse samples are needed to assess the effect of entrepreneurship on economic growth at the economy or national stage.

Against this backdrop, this article implements correlation analysis and a fixed effects model to analyse the influence of EFCs on economic growth in middle-income economies. In this article, we answer this research question: How can EFCs influence the economic growth of middle-income countries? The implemented panel data set for EFCs is extricated from the Global Entrepreneurship Monitor (GEM) website and that for gross domestic product (GDP) per capita, a surrogate for economic growth, is extracted from the

World Bank website over the observation period 2001 – 2021. We discover that there are statistically significant positive correlations between GDP per capita and ‘entrepreneurial finance’ and ‘post-school entrepreneurial education and training’, and statistically significant negative correlations between GDP per capita and ‘taxes and bureaucracy’, ‘internal market openness’, ‘physical and service infrastructure’ and ‘cultural and social norms’. Moreover, we expose that EFCs positively, significantly impact economic growth in middle-income countries.

This research article adds a voice to the discourse on the connection between economic growth and entrepreneurship by tendering insights into EFCs’ effects on economic growth at the economy stage in middle-income countries. First, we comprehensively assess the connections between EFCs and economic growth over an elongated observation period of 21 years, i.e. 2001 – 2021. Second, we implement panel data for 17 middle-income countries in our effort to analyse the influences of EFCs on economic growth in middle-income economies. We employ the 2021 classification by the World Bank. To the finest of our knowledge, no such study was conducted before.

The rest of the article is arranged as follows. Section 2 is devoted to literature review, and Section 3 outlines data and methodology issues. Section 4 articulates the study results, which are discussed in Section 5. Last of all, Section 6 presents the conclusions of the study, and provides study recommendations, limitations and areas for further research.

2. LITERATURE REVIEW

2.1 The concept of entrepreneurship

It is challenging to design a single entrepreneurship definition (Gomes & Ferreira, 2022). Therefore, in the existing literature, there is no accord when it comes to the definition of entrepreneurship (see Peprah & Adekoya, 2020 and references therein). Several definitions have been proposed in the literature. Gomes & Ferreira (2022) proposed that entrepreneurship ‘can be understood as the intention or action aiming to generate value through products, new methods or through new businesses’, and Xu, Yu & Li (2021) postulated that entrepreneurship may be defined as the ‘enterpriser’s spirit of adventure, reform and innovation to maximize profits and introduce new economic opportunities and economic ideas into the market under the condition of uncertain risks’. Naudé (2011) indicated that entrepreneurship can be described using three components: new enterprise formation, innovation and resource coordination. Since it is difficult

to define entrepreneurship and there is not accord in the extant literature on how entrepreneurship can be defined, [Gomes & Ferreira \(2022\)](#) posited that it is not easy to unearth a sound entrepreneurship measure that permits comparisons among economies. The authors ([Gomes & Ferreira, 2022](#)) further pronounced that this challenge is worsened by the presence of several global databases that implement different dimensions and measures of entrepreneurial activity.

For long, quantitative metrics have been implemented to assess entrepreneurship, with the quantity of new companies and the self-employment rate normally implemented in this respect ([Acs & Szerb, 2010](#); [Carree & Thurik, 2007](#)). Nonetheless, quantitative measures are associated with several shortcomings and they do not give us a true picture because entrepreneurship is a complex and multi-dimensional phenomenon (see, for instance, [Kim et al., 2022](#); [Gomes & Ferreira, 2022](#); [Doran, McCarthy & O'Connor, 2018](#); [Baliamoune-Lutz, 2015](#)). To address the shortcomings of the quantitative entrepreneurship metrics, more than a few novel entrepreneurship measures have been designed, e.g. EFCs indicators, and entrepreneurial attitudes and behaviour ([Acs & Szerb, 2010](#); [Doran, McCarthy & O'Connor, 2018](#); [Vatavu et al., 2022](#)).

2.2 Entrepreneurial ecosystem

The ecosystem for entrepreneurship or entrepreneurial ecosystem concept is fairly novel ([Walsh & Winsor, 2019](#); [Malecki, 2018](#)). There is no extensively shared definition of it ([Stam, 2015](#)), since among other issues, ecosystems are defined in diverse manners, at diverse levels, and with diverse research data and designs, and there are numerous diverse types of ecosystems, of which the entrepreneurial ecosystem is one of them ([Malecki, 2018](#); [Acs et al., 2017](#); [de Vasconcelos Gomes et al., 2016](#)). Therefore, numerous diverse definitions were designed in the existing literature by different scholars (see, for instance, [Malecki, 2018](#) and references therein). [Malecki \(2018\)](#) further indicated that numerous definitions of an entrepreneurial ecosystem highlight the interconnection of elements, usually through networks, resulting in common cultural morals that promote entrepreneurial action.

Ecosystems of entrepreneurship are societies comprising of numerous separate players, e.g., governments, universities, investors, media, mentors, service providers, and huge corporates that can significantly partake in the advancement of and stage of entrepreneurial action for a particular area ([Hechavarría & Ingram, 2019](#)). The ecosystem comprises of elements that influence the system's condition. The GEM pronounced that these factors include 'entrepreneurial finance', 'government support and policies', 'taxes and bureaucracy',

‘government programmes’, ‘basic school entrepreneurial education and training’, ‘post-school entrepreneurial education and training’, ‘research and development’, ‘commercial and professional infrastructure’, ‘internal market dynamics’, ‘internal market openness’, ‘physical and service infrastructure’, and ‘cultural and social norms’. Hechavarría & Ingram (2019) proffered that such factors generate multifaceted interdependences among actors that stimulates them to design an entrepreneurial community. From the above discussion, it can be seen that an entrepreneurial ecosystem is an independent and dynamic web of numerous diverse kinds of interdependent factors and actors that can promote productive entrepreneurship. Summarily, the ecosystem of entrepreneurship concept highlights that entrepreneurship occurs in a society of inter-reliant factors and parties.

Of late, research focus has been devoted to entrepreneurial ecosystems since they provide a framework that promote economic growth in an economy or region through encouraging and exploring entrepreneurial opportunities that can lead to entrepreneurial business actions (see, for example, Gomes, Ferreira & Lopes, 2023; Gomes et al., 2022; Farinha et al., 2020; Sitaridis & Kitsios, 2020; Lopes & Franco, 2019). Economic growth refers to a recurrent improvement in an economy’s GDP over a particular time period (Matenda & Sibanda, 2023). However, some scholars, such as, Alaassar, Mention & Aas (2022), Lux, Macau & Brown (2020), and Xie et al. (2021), indicated that entrepreneurial ecosystems can hinder the exploring and discovery of business opportunities. This indicates that there is no harmony in the extant literature regarding the bearing of entrepreneurial ecosystems on economic growth. In the same vein, Roundy & Lyons (2023) and Yan & Guan (2019) indicated that the effect of ecosystems of entrepreneurship on entrepreneurs recognising business prospects, organisational performance and structures, and the achievement or nonachievement of competitive edges is indistinct. Moreover, Gomes, Ferreira & Lopes (2023) postulated that the impact of EFCs on entrepreneurial ecosystems and economic growth is indistinct as well. Therefore, there is a need for further analysis, especially examining the impact of entrepreneurial ecosystems on economic growth. This will help policy-makers, governments, and decision-makers to formulate effectual and efficient interferences to encourage economic growth.

2.3 Connection between entrepreneurship and economic growth

In the existing literature, the connection between entrepreneurship and economic growth has been widely examined. The hunt of economic growth is a central goal for many economies (Peprah & Adekoya, 2020; Wenekers & Thurik, 1999).

Economic growth studies indicate that economic growth can be explained using the following theories: classical growth theory, neoclassical growth theory, new growth theory, and endogenous growth theory. The neoclassical growth theory shows how economic growth results when labour, technology, and capital come into play. Solow (1999) postulated that the neoclassical growth theory posits that the build-up of labour and capital is the driver of economic growth, whereas productivity and technological advancement augment the rate of economic growth. The endogenous growth theory postulates that economic growth is affected by interior issues, including innovation, human capital investment, innovation, and public sector role (Rijal, Idrus & Ahmad, 2023). Basically, the endogenous growth model postulates that economic growth is caused by endogenous factors and contrasts with the neoclassical growth theory which specifies that economic growth is caused by external factors. The new growth theory proposes that the growth and productivity of the economy are connected straight to people, particularly to what they need and want. The idea behind this theory is that the needs and wants of people stimulate their investing and purchasing decisions, whereas investing and purchasing drive the economy, i.e. investments and purchases of people result in the increase of real GDP per person. Lastly, the classical growth theory suggests that the economic growth of an economy will decline with a rising population and restricted resources.

Since economic growth can lead to augmented marginal productivity, resulting in higher incomes, more spending, and enhanced quality of life, the focus of governments worldwide is on how they can stimulate economic growth. Of late, research by scholars and policymakers devoted to the detection of factors that influence economic growth has been on the increase. Further, given the sophistication of global problems, e.g. the COVID-19 pandemic and the 2007 – 2009 crisis, it is essential for economies to design efficient and effective strategies to stimulate economic growth.

In reality, economic growth is determined by many issues. One of them is entrepreneurship. Entrepreneurship enacts a substantial part in promoting economic growth. The idea that entrepreneurship promotes economic growth initially arose at the start of the 19th century (see, for instance, Schumpeter, 1911). Recently, several researchers confirmed a positive connection between entrepreneurship and economic growth and development (Gomes et al., 2022; Munyo & Veiga, 2022; Sagar et al., 2023; Tahir & Burki, 2023; Wang & Shao, 2023; Lopes, Antunes & Rodrigues, 2018; Urbano & Aparicio, 2016; Raofi, Afghah & Hoshyar, 2014; Stefanescu, 2012). Bosma et al. (2018) combined entrepreneurship, institutions, and economic growth employing a parsimonious growth model in a three-stage least squares setup and discovered that productive

entrepreneurship results in economic growth. Existing literature indicated that entrepreneurship impacts economic growth in a multiplicity of ways embracing competition, job formation, productivity, industrial agglomeration, employment, knowledge spillovers, and innovation promotion (Kim et al., 2022; Tahir & Burki, 2023; Wang & Shao, 2023; Gaba & Gaba, 2022; Vatavu et al., 2021; Xu, Yu & Li., 2021; Stoica, Roman & Rusu, 2020; Savrul, 2017; Galindo & Mendez, 2014).

Tahir & Burki (2023) examined the link between economic growth and entrepreneurship in BRICS economies over the observation period 2002 – 2021. This article employed the following estimation techniques: fixed effects, generalised least squares, pooled least squares, and two stages least squares. The authors discovered that entrepreneurship is significantly, positively linked to economic growth. Khyareh (2023) assessed the moderating influence of governance quality incorporating six sub-indices (i.e. political stability, voice and accountability, rule of law, government effectiveness, control of corruption, and regulatory quality) premised on a data set of 54 economies over the sample period 2008 – 2020. This study revealed that the governance quality augments the positive link between economic growth and entrepreneurial activity. Implementing the Method of Moments Quantile Regression technique, Chikh-Amnache & Mekhzoumi (2023) examined the connection between female entrepreneurship and economic growth in Southeast Asian economies. The authors observed that the female entrepreneurship stimulates economic growth. Savrul (2017) examined the influence of entrepreneurial actions on economic growth at national level implementing a data set for 35 countries for the period 2006 - 2015 and revealed that, in the long term, entrepreneurship is positively connected to economic growth. Employing the DOLS squares model, Gaba & Gaba (2022) adopted a data set for the BRICS economies over the observation period 2014 - 2018 to analyse the connection between economic growth, and total early-stage entrepreneurial activity, entrepreneurial intention, established business ownership rate, and high job creation expectation rate. This article revealed that entrepreneurial intention is a substantial determinant of economic growth in the BRICS economies.

However, it should be noted that several scholars (see, for instance, Chhabra et al., 2023; Gomes et al., 2022; Dvoulety et al., 2018; Xu et al., 2021) articulated that it is not always the case that entrepreneurship leads to economic growth. Xu et al. (2021) postulated that not all entrepreneurship results in growth. Gomes et al. (2022) proffered that several articles which have assessed the connection between entrepreneurship and regional economic growth have confirmed this to be valid. Over the sample period 2004 – 2014, Zaki & Rashid (2016) assessed

the link between economic growth and entrepreneurship in seven emerging countries, i.e., Egypt, Mexico, Indonesia, Turkey, Romania, Hungary and India, and exposed that there is an adverse connection. [Salgado-Banda \(2005\)](#) and [Reynolds, Bygrave & Autio \(2003\)](#) are some of the authors that discovered an adverse link between economic growth and entrepreneurship. Further, adopting a panel data set for 111 emerging and developing economies as well as developed economies over the observation period 2001 – 2019 (i.e. 19 years), [Kim et al. \(2022\)](#) discovered that there is no evidence of a positive link between aggregate entrepreneurship and economic growth.

From the discussion above it can be revealed that the outcomes concerning the link between entrepreneurship and economic growth are assorted. This can be motivated by the fact that the relationship is influenced by the macroeconomic atmosphere in which the economic growth happens, the business environment and governance quality in a territory, the entrepreneurship type under deliberation ([Gomes et al., 2022](#); [Gu et al., 2021](#); [Hamdan et al., 2022](#); [Khyareh & Amini, 2021](#); [Stam & Van Stel, 2009](#); [Wong, Ho & Autio, 2005](#)).

2.4 Link between entrepreneurship and economic development

The link between entrepreneurship and economic growth is conditional on the economic development level of an economy ([Kim et al., 2022](#); [Doran, McCarthy & O'Connor, 2018](#); [Ferreira et al., 2017](#); [Urbano & Aparicio, 2016](#); [Naude, 2013](#); [Gries & Naude, 2010](#); [Bosma et al., 2009](#); [Valliere & Peterson, 2009](#)). The results concerning the bearing of entrepreneurship on economic growth in advanced and unadvanced countries are different ([Zaki & Rashid, 2016](#); [Stam & Van Stel, 2009](#); [Sternberg & Wennekers, 2005](#)). The reason can be that unadvanced and developed countries are associated with different economic situations ([Matenda & Sibanda, 2023a](#); [Valliere & Peterson, 2009](#)). In the same vein, [Sendra-Pons, Comeig & Mas-Tur \(2022\)](#) articulated that the influence of institutional issues on entrepreneurship level differs depending on the socioeconomic features of each economy. Further, the authors postulated that an extensive array of institutional conformations results in absence or presence entrepreneurship.

Some scholars have pronounced that entrepreneurship has more affirmative influence on economic growth in advanced economies than in developing economies. [Doran, McCarthy & O'Connor \(2018\)](#) analysed a panel data set for 55 economies through the observation years 2004–2011 and revealed that entrepreneurial attitudes have an affirmative influence on GDP per capita in high-income economies, and entrepreneurial activity has an adverse effect on GDP per capita in low/middle-income economies. [Ivanović-Djukić et al. \(2018\)](#)

adopted a dataset for 21 European economies and discovered that the contribution of entrepreneurship to economic growth is lesser in South-East European transition economies compared to higher developed European economies. In 2005, [Van Stel et al. \(2005\)](#) adopted a data set for 36 economies and exposed that entrepreneurial activity has a negative consequence on economic growth in poor economies and a positive impact on economic growth in rich economies. [Sautet \(2013\)](#) opined that entrepreneurship has an affirmative effect on economic growth in advanced economies, and discovered that, in developing economies, there is no evidence of such. [Stam & Van Stel \(2009\)](#) adopted a sample of 36 economies over the sample years 2002 - 2005, and discovered that entrepreneurship has no impact on economic growth in low-income countries and the converse is true for high-income and transition countries. Using a data set for 44 economies over the observation period 2004 – 2005, [Valliere & Peterson \(2009\)](#) discovered that entrepreneurship has no influence on economic growth in developing economies. [Sabella et al. \(2014\)](#) adopted data spanning over 16 years and exposed that entrepreneurship has no significant influence on economic growth in the West Bank of the Palestinian territories.

[Kim et al. \(2022\)](#), [Peprah & Adekoya \(2020\)](#) and [Adusei \(2016\)](#) propounded that the assessment of the existing literature indicates that research concerning the linkage between economic growth and entrepreneurship is hugely devoted to advanced economies, whereas in the developing countries, the literature is restricted. This is also supported by [Naude \(2011\)](#), [Anokhin & Schulze \(2009\)](#) and [Bruton, Ahlstrom & Obloj \(2008\)](#). Therefore, the results of the link between economic growth and entrepreneurship cannot give a true picture of the association between economic development and growth and entrepreneurship in developing and emerging economies ([Naudé, 2011](#)).

It appears there is some skepticism when it come to the significance of entrepreneurship to the growth dynamics of unadvanced economies ([Adusei, 2016](#)). The author ([Adusei, 2016](#)) indicated that this skepticism emanates from the fact that some scholars believe that replicative entrepreneurship, which is prevalent in unadvanced economies, is usually deemed not to be growth-supporting.

[Peprah & Adekoya \(2020\)](#) analysed the bearing of entrepreneurship on economic growth employing data for 10 African economies (South Africa, Morocco, Botswana, Sierra Leon, Nigeria, Namibia, Senegal, Zambia, Rwanda, and Mauritius). The authors ([Peprah & Adekoya, 2020](#)) exposed that entrepreneurship has an affirmative bearing on economic growth. [Adusei \(2016\)](#) analysed the influence of entrepreneurship on the growth dynamics of 12 African economies

and exposed that entrepreneurship is positively correlated to the variations in the growth these economies. [Stam & Van Stel \(2011\)](#) discovered that entrepreneurship has no noteworthy bearing on economic growth in high-income economies, but has a profound affirmative influence in low-income economies.

The examined literature indicates that the link between economic growth and entrepreneurship should be further assessed in both advanced and developing countries. [Crowley & McCann \(2018\)](#) postulated that further studies are required to deal with entrepreneurial issues in both transition-driven countries and innovation-driven countries. They further propounded that it is vital to differentiate countries since the dynamics of entrepreneurial innovation in advanced countries and transition-driven countries are dissimilar; diverse economies function in diverse innovative, institutional, and competitive atmospheres. Moreover, the extant literature concerning the link between economic growth and entrepreneurship in unadvanced economies reveals contradictory outcomes. Some scholars indicated that entrepreneurship has no impact on economic growth ([Valliere & c, 2009](#)), while others discovered an affirmative connection ([Wong et al., 2005](#)), and hitherto others exposed an adverse connection ([Doran, McCarthy & O'Connor, 2018](#); [van Stel, Carree & Thurik, 2005](#)). This lack of harmony highpoints the need for further examination of the association between economic growth and entrepreneurship.

2.5 Hypotheses development

Implementing a balanced panel approach premised on the GEM dataset over eight years, i.e. 2010-2017, containing 18 countries, [Pita, Costa & Moreira \(2021\)](#) indicated the ineptitude of institutions in promoting the craving to act entrepreneurially and opined that entrepreneurship has to be part of the acculturation process showing the significance of cooperative normative. The authors further stated that offering the structures and instruments is not adequate to promote people to begin an entrepreneurial expedition and exposed that contextual drivers are essential in promoting entrepreneurial inclination to begin a business.

Contextual issues of the economic atmosphere cause variations in entrepreneurial activity rates among economies ([Acs et al. 2018](#)). Interestingly, [Xu, Yu & Li \(2021\)](#) propounded that designing environments and institutions favourable to innovative entrepreneurship growth is crucial to upholding economic growth in developing economies. The GEM outlines EFCs which signify contextual factors. These EFCs appraises the business ecosystems existing in economies and the manners in which they can influence economic growth and entrepreneurial

actions (Gomes, Ferreira & Lopes, 2023). The authors (Gomes, Ferreira & Lopes, 2023) further postulated that the GEM business ecosystem model presumes that entrepreneurial actions react to interconnecting environmental and business factors.

In the existing literature, the general consensus is that economies with fertile and high-quality EFCs are attractive to entrepreneurs, which usually leads to high economic growth. That is to say, EFCs are drivers of economic growth. Nevertheless, economies are associated with dissimilar EFCs, which can influence entrepreneurial activity's outputs and inputs in a negative or positive manner (Amoros, Felzensztein & Gimmon, 2013). For instance, Vatavu et al. (2021) revealed that EFCs are associated with a momentous role in escalating economic stability in Group of 7 countries plus Russia, whereas Matenda & Sibanda (2023a) discovered that EFCs have an insignificant influence on GDP per capita in BRICS countries. Therefore, there is a need for more research concerning the influence of EFCs on economic growth.

As presented by the GEM, the main elements of the EFCs are the following 12 factors: (1) 'entrepreneurial finance'; (2) 'government support and policies'; (3) 'taxes and bureaucracy'; (4) 'government programmes'; (5) 'basic school entrepreneurial education and training'; (6) 'post-school entrepreneurial education and training'; (7) 'research and development'; (8) 'commercial and professional infrastructure'; (9) 'internal market dynamics'; (10) 'internal market openness'; (11) 'physical and service infrastructure'; and (12) 'cultural and social norms'. These factors generate sophisticated interconnections among partakers that stimulates them to develop an entrepreneurial community (Hechavarría & Ingram, 2019).

Entrepreneurial finance denotes the obtainability of financial resources (both equity and debt) for SMEs (as well as subsidies and grants). Generally, access to finance affects entrepreneurship (see, for instance, Wennekers & Thurik, 1999). Several authors show that financing is an essential institutional component for entrepreneurship (see, for example, Sendra-Pons, Comeig and Mas-Tur, 2022; Kumar & Borbora, 2016; Estrin & Mickiewicz, 2010). Dutta & Meierrieks (2021) proffered that greater financial development stages result in greater entrepreneurial activity levels through meeting the request for cheap, handy and wide-ranging credit by entrepreneurs and through the request for the cost-effective and efficient management of risk and information by investors. Restrictions on entrepreneurial actions financing negatively affect the formation of new businesses and development and existence of those corporations in operation (Brown & Earle, 2017). This indicates that the deficiency of investment funds is

one of the key challenges in the entrepreneurial world. So, generally speaking, funding has a positive effect on entrepreneurial actions and economic growth. Consequently, we design the succeeding hypothesis:

H₁: ‘Entrepreneurial finance’ has a positive impact on the economic growth of middle-income economies.

Government support and policies indicate the degree to which public policies stimulate entrepreneurship as a pertinent economic phenomenon. Government support can be provided through subsidies, business training programmes, consultancy, etc. The scientific harmony in the extant literature is that government support and policies promote the creation and new businesses. In support of this, [Gomes, Ferreira & Lopes \(2023\)](#) opined that government support, given through innovation-oriented policies, can drive entrepreneurial actions. [Gomes et al. \(2022\)](#) discovered that government programmes positively affects economic growth for OECD countries irrespective of their development stage. Nonetheless, the association between entrepreneurship and government support is not consensual, since diverse social contexts can result in diverse policy outcomes ([Hechavarría & Ingram, 2019](#)). Under the same line of reasoning, [Vatavu et al. \(2021\)](#) articulated that the influences of policies on entrepreneurship and economic development are diverse. Even though several studies connect government policy to entrepreneurial action ([McMullen, Bagby & Palich, 2008](#)), some authors find no connection between government policy and entrepreneurial action ([Levie & Autio, 2008](#)). This indicates that government programmes can influence entrepreneurship in a different way. Nevertheless, the general accord in the existing literature is that government support and policies promote entrepreneurship and economic growth (see, for example, [Saberri & Hamdan, 2019](#)). Therefore, we develop the following hypothesis:

H₂: ‘Government support and policies’ has a positive influence on the economic growth of middle-income economies.

In this regard, bureaucracy and taxation refers to the degree to which bureaucracy, taxation and other regulations are size-neutral or inspire new businesses and SMEs. Bureaucracy, taxation and other regulations can act as a blockade to entrepreneurial actions and, ultimately to economic growth (see [Acs, Desai & Hessels, 2008](#)). [Levie & Autio \(2008\)](#) proffered that taxes result in an upsurge in direct financial costs for corporates and they eliminate enticements for entrepreneurial actions. Nevertheless, appropriately administered tax policies may give inducements for corporates to grow and innovate ([Keuschnigg & Nielsen, 2004](#)). The authors further articulated that progressive tax may strengthen entrepreneurship, but it may have no influence as well. Bureaucracy

can adversely influence the economy (see: [Stenholm, Acs & Wuebker, 2013](#)). The reason being that entrepreneurs can become demotivated when they try to start new corporates; thereby suffering higher start-up costs and failing to exploit entrepreneurial openings ([Audretsch et al., 2019](#); [Mullins & Forlani, 2005](#)). [Hechavarría & Ingram \(2019\)](#) stated that compliance with regulations can increase costs for entrepreneurs. Therefore, the following hypothesis is generated:

H₃: ‘Taxes and bureaucracy’ has a negative influence on the economic growth of middle-income economies.

Government programmes indicate the existence and quality of programmes unswervingly helping SMEs at all government stages, i.e., municipal, regional, and national. In practice, several governments have been playing a vital part in entrepreneurial investments success. Government programmes such as subsidies, skills development, and consultancy and guidance promote entrepreneurship in countries (see, for example, [Saberí & Hamdan, 2019](#); [Pickernell et al., 2013](#); [Méndez-Picazo, Galindo-Martín, & Ribeiro-Soriano, 2012](#)). [Chowdhury, Audretsch, & Belitski \(2019\)](#) postulated that government programmes reduce the costs of forming novel businesses and correct market failures. Even though some studies discovered that government interventions have an adverse influence on entrepreneurship by ebbing its innovative tendencies (see, for instance, [Cheng et al., 2017](#)), we design the following hypothesis:

H₄: ‘Government programmes’ has a positive influence on the economic growth of middle-income economies.

Basic school entrepreneurial education and training denotes to the degree to which training in forming or managing SMEs is included in the education and training fabric at secondary and primary stages. Similarly, post-school entrepreneurial education and training denotes the degree to which training in forming or managing SMEs is included in the education and training fabric in higher education. Interestingly, research interest in entrepreneurship education has been on the increase of late. Entrepreneurship education is usually associated with experiences concerning business activities. Greater levels of entrepreneurship education promote the formation of new corporates, create job, stimulate growth of SMEs and reduce poverty, and ultimately lead to higher levels of economic growth ([Bakar, Islam & Lee, 2015](#); [Isaacs et al., 2007](#)). [Candiya Bongomin et al. \(2018\)](#) indicated that, at the basic stage, entrepreneurial education amplifies inherent motivation and invigorates business formation exploits, particularly in developing economies. Here, the following hypotheses are developed:

H₅: ‘Basic school entrepreneurial education and training’ has a positive influence on the economic growth of middle-income economies.

H₆: ‘Post-school entrepreneurial education and training’ has a positive influence on the economic growth of middle-income economies.

In this context, research and development transfer refers to the degree to which state research and development result in novel commercial prospects and is obtainable by SMEs. In other words, [Amorós & Bosma \(2014\)](#) specified that research and development denote to the degree to which state research and development outcomes results in novel openings in commercial stipulations and the manner they become accessible to SMEs. Extant literature postulated that SMEs promote knowledge transfer and its revolution into economic value; thus, stimulating economic growth. Fascinatingly, [Audretsch & Lehmann \(2005\)](#) indicated that the transfers of knowledge are associated with greater entrepreneurship levels and, ultimately, results in economic growth. Thus, in this study, we design the ensuing research hypothesis:

H₇: ‘Research and development transfer’ has a positive influence on the economic growth of middle-income economies.

Commercial and professional infrastructure denotes the presence of property rights, commercial, accounting, and other legal and assessment services and establishments that promote or support SMEs. [Hechavarría & Ingram \(2019\)](#) and [Levie & Autio \(2008\)](#) indicated that commercial and professional infrastructure comprises of professional support services vital to starting a novel business, e.g., consultant and supplier contracts, etc. Existing literature propounded that entrepreneurs can focus on their businesses when commercial and profession infrastructure exists and work efficiently and effectively; thereby promoting the formation of new corporates. Against this backdrop, we present the following hypothesis:

H₈: ‘Commercial and professional infrastructure’ has a positive influence on the economic growth of middle-income economies.

Internal market dynamics refers to the degree of alteration in markets from one year to the other. More dynamic markets are associated with greater levels of risk, uncertainty and unpredictability; thereby, creating possibilities for entrepreneurs to maximise the values of their corporates as compensation for the risks they take and trying to warrant the optimum mixture of resources to attain the greatest stages of competitiveness and efficiency ([Magnani & Zucchella, 2018](#)). This indicates that dynamic markets are associated with higher levels of economic growth and entrepreneurship. Therefore, we develop the following hypothesis:

H₉: ‘Internal market dynamics’ has a positive influence on the economic growth of middle-income economies.

Internal market openness refers to the degree to which new businesses are unrestricted to infiltrate current markets. In other words, Amorós & Bosma (2014) postulated that internal market openness indicates the freedom of new corporates to penetrate present markets. Basically, if it is difficult to penetrate new markets, prospective entrepreneurs become demotivated to infiltrate these markets. More opportunities for new corporates to penetrate the existing markets may stimulate entrepreneurship (see, for instance, Fuentelsaz et al., 2015), thereby affecting economic growth (Aparicio, Urbano & Audretsch, 2016). Against this background, the hypothesis below is suggested:

H₁₀: ‘Internal market openness’ has a positive influence on the economic growth of middle-income economies.

Physical infrastructure shows that effortlessness of passage to physical resources at a price that does not differentiate against SMEs. These physical resources include utilities, communication, transportation, and space or land. Gomes, Ferreira and Lopes (2023) postulated that physical and service infrastructure consists of, among other things, communication services, and rail, road and air transport networks. Physical and service infrastructure is indispensable to entrepreneurial actions. It connects external and internal markets (Acs et al., 2014). Thus, we design the hypothesis below:

H₁₁: ‘Physical and service infrastructure’ has a positive influence on the economic growth of middle-income economies.

Cultural and social norms represent the degree to which social and cultural norms endorse or allow actions leading to new business methods or actions that may possibly amplify personal wealth and income. Hofstede (2001) articulated that culture is ‘the collective programming of the mind that distinguishes the members of one group or category of people from another.’ A community that values entrepreneurship culture via appreciating the attitudes of entrepreneurs, affirmative media depictions of entrepreneurial actions and an institutional atmosphere that is not antagonistic to entrepreneurial actions stimulates the will and desire of people to be entrepreneurs (Guerrero et al., 2021). Hechavarría & Ingram (2019) postulated that norms and culture of social acceptance of entrepreneurial actions affects entrepreneurship positively and boost economic growth. Hence, the following hypothesis is designed:

H₁₂: ‘Cultural and social norms’ has a positive influence on the economic growth of middle-income economies

3. MATERIALS AND METHODS

3.1 Sample and data

This paper adopts a sample of 17 upper-middle-income and lower-middle-income economies as categorised by the World Bank in 2021, i.e., Argentina, Colombia, South Africa, Russia, Brazil, China, Ecuador, Egypt, Guatemala, India, Turkey, Iran, Mexico, Peru, Thailand, Malaysia, and Jamaica. Of all these 17 economies, only Egypt, India, Iran, and Thailand are categorised as lower-middle-income economies. Lower-middle-income economies possess a gross national income (GNI) per capita between \$1 086 and \$4 255, and upper-middle-income economies possess a GNI per capita between \$4 256 and \$13 205. The 2021 GNI per capita value is considered when classifying countries. The panel data for the study is gathered over an observation period of 21 years, i.e. 2001 – 2021. The choice of the period 2001 - 2021 is due to data availability. The GDP per capita is implemented as a surrogate for economic growth because it is one of the most imperative and broadly applied economic growth indicators. Data for EFCs is collected from the GEM website, and data for GDP per capita is pooled from the World Bank’s World Development Indicators (WDI) database.

3.2 Measurement

This article examines the bearing of EFCs on economic growth in middle-income countries. The GDP per capita (as a logarithm) is implemented as the dependent variable. We use 12 variables (presented by the GEM) that represent EFCs as independent variables. This study includes gross capital formation and unemployment rate as control variables since entrepreneurship is closely associated with the external environment. Table 1 below outlines the variables implemented in this article.

Table1: Dependent and independent covariates

Acronyms	Variables	Definition
Dependent variable		
loggdp	GDP per capita (current US\$)	GDP per capita refers to GDP divided by mid-year population
Independent variables		
fin	Entrepreneurial finance	The obtainability of financial resources (i.e. debt and equity) for SMEs (incorporating subsidies and grants)

Acronyms	Variables	Definition
govsup	Government support and policies	The degree to which public policies promote entrepreneurship as an essential economic phenomenon
tax	Taxes and bureaucracy	The degree to which public policies promote entrepreneurship – regulations or taxes are size-neutral or promote novel businesses and SMEs
govpro	Government programmes	The existence and quality of programmes unswervingly helping SMEs at all government levels, i.e. municipal, regional and national
basch	Basic school entrepreneurial education and training	The degree to which training in managing or forming SMEs is included in the training and education fabric at secondary and primary stages
postsch	Post-school entrepreneurial education and training	The degree to which training in managing or forming SMEs is included in the training and education fabric in higher education
rnd	Research and development transfer	The degree to which national research and development will result in new commercial openings and is accessible by SMEs
compro	Commercial and professional infrastructure	The existence of property rights, accounting, commercial and other legal and evaluation services and establishments that promote or support SMEs
mktdyn	Internal market dynamics	The degree of alteration in markets from year to year
mktope	Internal market openness	The degree to which novel businesses are unrestricted to penetrate prevailing markets
physerv	Physical and service infrastructure	Ease of passage to physical and service resources at a price that does not differentiate against SMEs
culsoc	Cultural and social norms	The degree to which social and cultural norms endorse or allow actions leading to novel business actions or methods that can possibly amplify personal wealth and income
Control variables		
grossc	Gross capital formation (% of GDP)	Gross capital formation (previously gross domestic investment) contains outlays on additions to the fixed assets of the economy in addition to net changes in the inventory level
unempl	Unemployment, total (% of the total labour force)	Unemployment is the proportion of the labour force that is not working but is open for and looking for employment

Source: [GEM \(2023\)](#), [World Bank \(2023\)](#)

3.3 Method

In this study, we implement a panel data set with yearly scores for the data gathered from 2001 – 2021. The data set comprises 357 observations. Some variables have missing data. This article imputes the missing data using mean imputation. In this procedure, for each country, we calculate the mean values for nonmissing values for variables with missing data and then replace missing values with the computed mean values. The study implements mean imputation because it is easy and quick to perform.

First, we compute the descriptive statistics to reveal the essential features of the implemented variables as the first stage in statistical data analysis. These descriptive statistics include maximum and minimum values, standard deviations, and means. Second, we calculate correlation coefficients between independent and dependent covariates to check multicollinearity between covariates. Considering the correlation coefficients between the variables, we observe that some variables are highly correlated. To deal with the multicollinearity challenge, we apply principal component analysis (PCA), a variable reduction procedure, instead of deleting some of the highly correlated covariates. Deleting variables would eliminate variables that have vital information when explaining economic growth. PCA upholds the original explanatory ability of the indicators. Third, we assess the stationarity of the implemented panel data. Fourth, we evaluate the bearing of EFCs on economic growth in middle-income economies implementing a fixed effects model for panel data which permits us to examine the bearing of EFCs variables that shift over time on economic growth. In addition to control variables, PCA indexes extracted from EFCs are used as independent variables.

The fixed effects model employed in this analysis is given by

$$GDP_{it} = c_i + \beta_1 PC_{1it} + \beta_2 PC_{2it} + \dots + \beta_k PC_{kit} + \beta_{k+1} UR_{(k+1)it} + \beta_{k+2} GC_{(k+2)it} + \varepsilon_{it},$$

where, for the i^{th} economy at time t , GDP_{it} is GDP per capita (logarithm), c_i represents the intercept, $\beta_1 \dots \beta_{k+2}$ denote coefficients of regression, $PC_{1it} - PC_{kit}$ signify PCA indexes, $UR_{(k+1)it}$ is the unemployment rate, $GC_{(k+2)it}$ is the gross capital formation, and ε_{it} is the error term

4. RESULTS

Descriptive statistics for dependent and independent covariates adopted in this study are indicated in Table 2.

Table 2: Descriptive statistics

	Min.	Max.	Avg.	SD
loggdp	2.65	4.20	3.69	0.30
fin	2.48	6.82	4.19	0.72
govsup	2.27	6.32	4.13	0.75
tax	2.03	5.87	3.58	0.64
govpro	2.23	5.73	3.95	0.66
basch	0.94	5.13	3.20	0.52
postsch	2.90	6.25	4.75	0.63
rnd	2.42	5.53	3.68	0.55
compro	2.10	6.65	4.75	0.51
mktdyn	3.07	7.25	5.16	0.82
mktope	2.15	5.88	4.08	0.48
physerv	3.87	7.40	6.01	0.56
culsoc	3.37	7.63	4.82	0.61
unempl	0.25	33.56	8.18	6.15
grossc	10.85	46.66	24.22	7.77

Source: Authors’ calculations.

Table 3 indicates the correlation coefficient matrix. From the correlation coefficient matrix, we observe high correlation coefficients between some of the indicators. Therefore, our model can be affected by multicollinearity. Thus, we use PCA to deal with the multicollinearity challenge.

Bearing in mind the correlation coefficients’ magnitudes and statistical significances, we ascertain that there are statistically significant positive correlations between GDP per capita and ‘entrepreneurial finance’ and ‘post-school entrepreneurial education and training’, and statistically significant negative correlations between GDP per capita and ‘taxes and bureaucracy’, ‘internal market openness’, ‘physical and service infrastructure’ and ‘gross capital formation’. Negative correlation coefficients show that as the values of the covariate rise, economic growth declines. On the other hand, positive correlation coefficients indicate that as the values of the covariates increase, economic growth surges up. The correlation coefficients for all other covariables (i.e., govsup (+), govpro (+), basch (+), rnd (+), compro (-), mktdyn (+), culsoc (-), and unempl (+)) are not statistically significant. Based on the correlation coefficients, we deduce that EFCs have a bearing on economic growth in middle-income countries. We employ PCA to obtain indexes from the adopted entrepreneurship variables to deal with the multicollinearity challenge in regression and to reduce the number of variables to avoid overfitting.

Table 3: Correlation matrix

	loggdp	fin	govsup	tax	govpro	basch	postsch	rnd	compro	mktdyn	mktope	physerv	culsoc	unempl	grossc
loggdp	1														
fin	0.114*	1													
govsup	0.003	0.059	1												
tax	-0.153**	-0.046	0.640**	1											
govpro	0.101	0.022	0.743**	0.596**	1										
basch	0.085	0.116*	0.468**	0.446**	0.516**	1									
postsch	0.153**	-0.029	0.191**	0.245**	0.488**	0.590**	1								
rnd	0.029	0.114*	0.686**	0.634**	0.778**	0.587**	0.395**	1							
compro	-0.068	-0.104	0.258**	0.379**	0.368**	0.514**	0.482**	0.461**	1						
mktdyn	0.082	0.157**	0.379**	0.346**	0.266**	0.095	-0.242**	0.478**	0.124*	1					
mktope	-0.203**	-0.115*	0.536**	0.614**	0.654**	0.562**	0.363**	0.648**	0.578**	0.237**	1				
physerv	-0.169**	-0.094	0.294**	0.548**	0.329**	0.182**	0.236**	0.418**	0.257**	0.323**	0.408**	1			
culsoc	-0.016	-0.015	0.433**	0.511**	0.653**	0.596**	0.660**	0.587**	0.440**	0.086	0.675**	0.438**	1		
unempl	0.045	0.016	0.002	-0.328**	-0.291**	-0.159**	-0.343**	-0.244**	-0.167**	-0.143**	-0.214**	-0.452**	-0.323**	1	
grossc	-0.148**	0.169**	0.286**	0.380**	0.134*	0.118*	-0.067	0.411**	-0.107*	0.439**	0.105*	0.323**	0.202**	-0.242**	1

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' calculations.

The adopted variable data must be stationary to avoid spurious regression results. We perform the unit root tests to assess whether the data is stationary or not. In this paper, we test the panel data stationarity using the ADF - Fisher Chi-square and Im, Pesaran and Shin panel unit root tests. In these tests, H_0 (the null hypothesis) asserts that there is a unit root. If the panel unit root tests are significant (i.e., $p \leq 0.05$), we discard H_0 and resolve that the panel data has no unit root. Outcomes of the conducted unit root tests (see Table 4) reject H_0 of the existence of the unit root. We conduct the unit root tests in level and with individual intercept term in each testing equation. We conclude that, at the 5% level, the data is stationary.

Table 4: Panel unit root tests

Variable	Im, Pesaran and Shin W-stat		ADF - Fisher Chi-square	
	Statistic	Prob**	Statistic	Prob**
loggdgdp	-4.62930	0.0000	79.4531	0.0000
fin	-6.22944	0.0000	102.041	0.0000
govsup	-4.40967	0.0000	78.3028	0.0000
tax	-5.45890	0.0000	97.9725	0.0000
govpro	-4.50776	0.0000	75.4391	0.0001
basch	-5.36232	0.0000	90.5789	0.0000
postsch	-5.28513	0.0000	91.9090	0.0000
rnd	-5.33467	0.0000	88.0200	0.0000
compro	-6.46540	0.0000	107.562	0.0000
mktodyn	-4.26952	0.0000	74.9463	0.0001
mktope	-5.82113	0.0000	100.073	0.0000
physerv	-4.73510	0.0000	84.6310	0.0000
culsoc	-5.25358	0.0000	90.8301	0.0000
grossec	-2.74861	0.0030	57.5087	0.0071
unempl	-2.98450	0.0014	63.9431	0.0014

**Fisher test probabilities are computed by implementing an asymptotic Chi-square distribution. Nevertheless, all other tests assume asymptotic normality.

Source: Authors' calculations.

The principal components (and their respective eigenvalues) extricated from the adopted 12 EFCs using PCA are outlined in Table 5. As a standard, principal components associated with eigenvalues smaller than 1 are disregarded from the assessment, and those associated with eigenvalues greater than 1 are embraced for analysis (see Scholes, 2010; Kaiser, 1970). Hence, only three components, i.e., PC1, PC2 and PC3, have eigenvalues bigger than 1. These three indexes explain 70.24% of the variance as shown by the cumulative proportion. This percentage is greater than the 50% limit needed for a tolerable extraction (Stern, 2010).

Table 5: Variance explained

Component	Eigenvalues	Variance explained
PC1	5.617	46.806
PC2	1.652	60.569
PC3	1.160	70.239
PC4	0.795	76.862
PC5	0.750	83.113
PC6	0.473	87.053
PC7	0.411	90.478
PC8	0.382	93.661
PC9	0.258	95.809
PC10	0.226	97.692
PC11	0.156	98.988
PC12	0.121	100.000

Source: Authors' calculations.

Table 6 below presents the factor loadings, which indicate the correlations between the variables and the components (Matenda & Sibanda, 2023).

Table 6: Factor loadings

Variable	PC1	PC2	PC3
fin	0.006	0.251	0.851
govsup	0.740	0.342	0.111
tax	0.773	0.255	-0.202
govpro	0.847	0.056	0.110
basch	0.731	-0.290	0.307
postsch	0.582	-0.671	0.136
rnd	0.867	0.216	0.135
compro	0.620	-0.311	-0.110
mktdyn	0.354	0.770	-0.005
mktope	0.826	-0.048	-0.162
physerv	0.544	0.207	-0.448
culsoc	0.801	-0.294	0.005

Source: Authors' calculations.

On PC1, the most significant impact comes from 'research and development transfer', and the smallest influence comes from 'entrepreneurial finance.' All EFCs variables are positively related to PC1. Thus, economies with larger scores for EFCs indicators have a larger PC1 value. Considering PC2, the most significant effect originates from 'internal market dynamics', and the least influence emanates from 'internal market openness'. 'Cultural and social norms,'

‘internal market openness,’ ‘commercial and professional infrastructure,’ ‘post-school entrepreneurial education and training,’ and ‘basic school entrepreneurial education and training’ are the only variables with a negative impact on PC2; the rest have a positive bearing. Hence, countries get greater PC2 scores when the values for ‘cultural and social norms,’ ‘internal market openness,’ ‘commercial and professional infrastructure,’ ‘post-school entrepreneurial education and training,’ and ‘basic school entrepreneurial education and training’ are low, whereas those for ‘entrepreneurial finance,’ ‘government support and policies,’ ‘tax and bureaucracy,’ ‘government programmes,’ ‘research development transfer,’ ‘internal market dynamics’ and ‘physical and service infrastructure’ are high.

Lastly, on PC3, the greatest effect comes from ‘entrepreneurial finance,’ and the most negligible impact originates from ‘internal market dynamics’ and ‘cultural and social norms.’ ‘Taxes and bureaucracy,’ ‘internal market openness,’ ‘commercial and professional infrastructure,’ ‘internal market dynamics,’ and ‘physical and service infrastructure’ are the only indicators with an adverse influence on PC3; the rest have a positive bearing. Therefore, economies get higher PC3 scores when the values for ‘taxes and bureaucracy,’ ‘internal market openness,’ ‘commercial and professional infrastructure,’ ‘internal market dynamics,’ and ‘physical and service infrastructure’ are low, whereas the values for ‘entrepreneurial finance,’ ‘government support and policies,’ ‘government programmes,’ ‘basic school entrepreneurial education and training,’ ‘post-school entrepreneurial education and training’ and ‘cultural and social norms’ are high.

Table 7 presents regression results with 95% confidence. We regress EFCs indexes and control variables on the GDP per capita using a fixed effects model. To select the suitable model between a random effects model for panel data and a fixed effects model for panel data, we implement the Hausman test. Since the Hausman test p-value is 0.0001, which is less than 0.05, we adopt a fixed effects model.

Table 7: Regression results

Variable	Coefficient	Prob.
PC1	-0.003591	0.8665
PC2	0.080899	0.0040
PC3	-0.025348	0.0963
Unempl	-0.026459	0.0000
Grossec	0.009105	0.0182
C	3.688307	0.0000

Source: Authors’ calculations.

Our results indicate that, in addition to unemployment rate and gross capital formation, EFCs represented by PC2 significantly impact the economic growth in middle-income countries. PC2 has a positive coefficient of regression. PC1 and PC3 have an insignificant negative influence on the economic growth in middle-income countries. The unemployment rate has an adverse influence and gross capital formation has a positive impact on economic growth in middle-income economies. Interestingly, the designed model has an adjusted R-squared, a measure of goodness of fit, of 61.80%. This implies the model can explain 61.80% of the GDP per capita variance. Consequently, the developed model can be deemed a good model.

The findings of this study indicate that EFCs have a significant positive bearing on economic growth in middle-income economies. Specifically, as the PC2 score surges up, GDP per capita rises up. Now we turn our focus on the configurations of PC2 to understand the dynamics of the influence of EFCs on economic growth in middle-income economies. Considering PC2, the most significant effect originates from ‘internal market dynamics’ (0.770), followed by ‘post-school entrepreneurial education and training’ (-0.671), ‘government support and policies’ (0.342), ‘commercial and professional infrastructure’ (-0.311), ‘cultural and social norms’ (-0.294), ‘basic school entrepreneurial education and training’ (-0.290), ‘tax and bureaucracy’ (0.255), ‘entrepreneurial finance’ (0.251), ‘research development transfer’ (0.216), ‘physical and service infrastructure’ (0.207), ‘government programmes’ (0.056), and ‘internal market openness, (-0.048).

This suggests that ‘entrepreneurial finance’, ‘government support and policies’, ‘tax and bureaucracy’, ‘government programmes’, ‘research development transfer’, ‘internal market dynamics’ and ‘physical and service infrastructure’ have a positive bearing on economic growth in middle-income economies. Further, low levels of ‘cultural and social norms,’ ‘internal market openness,’ ‘commercial and professional infrastructure,’ ‘post-school entrepreneurial education and training’, and ‘basic school entrepreneurial education and training’ lead to greater levels of economic growth in middle-income economies.

Table 8 below provides a results summary with respect to the stated research hypotheses.

Table 8: Results summary

Research hypothesis	Supported?
H₁ : ‘Entrepreneurial finance’ has a positive impact on the economic growth of middle-income economies.	Yes
H₂ : ‘Government support and policies’ has a positive influence on the economic growth of middle-income economies.	Yes
H₃ : ‘Taxes and bureaucracy’ has a negative influence on the economic growth of middle-income economies.	No
H₄ : ‘Government programmes’ has a positive influence on the economic growth of middle-income economies.	Yes
H₅ : ‘Basic school entrepreneurial education and training’ has a positive influence on the economic growth of middle-income economies.	No
H₆ : ‘Post-school entrepreneurial education and training’ has a positive influence on the economic growth of middle-income economies.	No
H₇ : ‘Research and development transfer’ has a positive influence on the economic growth of middle-income economies.	Yes
H₈ : ‘Commercial and professional infrastructure’ has a positive influence on the economic growth of middle-income economies.	No
H₉ : ‘Internal market dynamics’ has a positive influence on the economic growth of middle-income economies.	Yes
H₁₀ : ‘Internal market openness’ has a positive influence on the economic growth of middle-income economies.	No
H₁₁ : ‘Physical and service infrastructure’ has a positive influence on the economic growth of middle-income economies.	Yes
H₁₂ : ‘Cultural and social norms’ has a positive influence on the economic growth of middle-income economies.	No

Source: Authors’ compilation

5. DISCUSSIONS

Premised on the results discovered, ‘entrepreneurial finance’ positively impacts economic growth in middle-income economies. That is to say, in middle-income economies, ‘entrepreneurial finance’ promotes economic growth. In agreement with our finding, [Gomes, Ferreira & Lopes \(2023\)](#) and [Gomes et al. \(2022\)](#) revealed that ‘entrepreneurial finance’ positively influences economic growth in OECD countries, irrespective of their development stages. [Dutta & Meierrieks \(2021\)](#), [Liu et al. \(2021\)](#), [Shaikh, Tunio & Qureshi \(2021\)](#), and [Brown & Earle \(2017\)](#) are some of the authors that have indicated that funding has an affirmative action on entrepreneurship and ultimately, economic growth. Nonetheless, [Pita, Costa & Moreira \(2021\)](#) exposed that funding measures discourage entrepreneurial initiatives.

As in [Gomes et al. \(2022\)](#), we discovered that ‘government programmes’ positively influences economic growth. This is not surprising since government programmes promote intelligent cities’ development, help transform industries to achieve sustainable goals, and encourage the innovative spirit of entrepreneurs ([Kim et al., 2016](#); [Martinez-Fierro, Biedma-Ferrer & Biedma-Ferrer, 2015](#); [Acs & Amoros, 2008](#)). [Gomes, Ferreira & Lopes \(2023\)](#) postulated that, in OECD economies, government programmes have an adverse influence in high-income countries and a positive influence in upper-middle-income countries.

Unexpectedly, we exposed that ‘taxes and bureaucracy’ and economic growth are positively associated. This may be due to the fact that taxes and bureaucracy can drive down the informal economy, and business regulations are vital in ensuring that the market economy functions suitably, thereby leading to economic growth. Our finding is supported by [Gomes et al. \(2022\)](#), [Vatavu et al. \(2021\)](#) and [Khyareh, Khairandish & Torabi \(2019\)](#). [Gomes et al. \(2022\)](#) articulated that ‘taxes and bureaucracy’ positively influences economic growth in innovation-driven economies. [Gomes, Ferreira & Lopes \(2023\)](#) discovered that ‘taxes and bureaucracy’ has a positive effect on economic growth in OECD economies; specifically, in high-income countries. However, [Gomes et al. \(2022\)](#) exposed that ‘taxes and bureaucracy’ adversely affects economic growth in transition-driven countries. [Gomes, Ferreira & Lopes \(2023\)](#) exposed that ‘taxes and bureaucracy’ has an adverse influence on economic growth in upper-middle-income countries. [Matenda & Sibanda \(2022\)](#), [Aralica et al. \(2018\)](#) and [Domanska & Zajkowski \(2018\)](#) are some of the authors who stated that there is an adverse connection between ‘taxes and bureaucracy’ and economic growth.

As in [Vatavu et al. \(2021\)](#), ‘government support and policies’ has a positive influence on economic growth. The reason being that governments can support corporates in different dimensions such as the provision of subsidies and consultancy services, which promote economic growth. In support of this, [Gomes, Ferreira & Lopes \(2023\)](#) postulated that government support, given through innovation-directed policies, can assist as an entrepreneurial actions driver. Innovation can promote the formation of novel businesses. However, [Gomes et al. \(2022\)](#) and [Matenda & Sibanda \(2022\)](#) exposed that ‘government support and policies’ negatively affects economic growth. [Gomes, Ferreira & Lopes \(2023\)](#) propounded that ‘government support and policies’ has an adverse effect on economic growth in OECD economies, irrespective of their development stages.

We expose that low levels of ‘basic school entrepreneurial education and training’ lead to high levels of economic growth. This is unsurprising since learners in several middle-income economies are trained to be job seekers rather than

entrepreneurs, which negatively impacts the degree of entrepreneurial pursuits (see, for instance, Matenda & Sibanda, 2022). In the same vein, Gomes et al. (2022) articulated that ‘basic school entrepreneurial education and training’ adversely influences the economic growth in OECD economies, regardless of their development stages. However, Gomes, Ferreira & Lopes (2023) opined that ‘basic school entrepreneurial education and training’ has a positive influence on economic growth in OECD economies, regardless of their income stages. In addition, we found that low levels of ‘post-school entrepreneurial education and training’ are related to high levels of economic growth in middle-income economies. This finding agrees with the findings of Gomes et al. (2022), Matenda & Sibanda (2022) and Lopes et al. (2021a). Matenda & Sibanda (2022) opined that qualified people are risk averse and this adversely affects the level of entrepreneurial pursuits, resulting in low levels of economic growth. However, our finding contradicts the finding of Lopes, Antunes & Rodrigues (2018). Gomes, Ferreira & Lopes (2023) stated that ‘post school entrepreneurial education and training’ has a positive impact on economic growth in OECD economies, regardless of their income stages.

The study results indicate that ‘research and development transfer’ positively influences economic growth in middle-income economies. In line with our findings, Gomes, Ferreira & Lopes (2023) exposed that research and development transfer has a positive influence on economic growth in OECD economies, regardless of their income stages. Gomes et al. (2022) discovered that ‘research and development transfer’ is positively related to economic growth in transition-driven economies and is adversely connected to economic growth in innovation-driven economies. Pita, Costa & Moreira (2021) exposed that research and development transfer discourage entrepreneurial initiatives.

In this study, it is discovered that low values of ‘commercial and professional infrastructure’ are related to high levels of economic growth. In support of this, Gomes et al. (2022) and Matenda & Sibanda (2022) exposed that ‘commercial and professional infrastructure’ is adversely related to economic growth. This result may be due to the fact that middle-income economies’ commercial and professional infrastructure is not well organised and implemented to stimulate economic growth (see, for instance, Matenda & Sibanda, 2022). On the other hand, Gomes, Ferreira & Lopes (2023) discovered that ‘commercial and professional infrastructures’ has a positive association with economic growth in OECD economies, regardless of their income stages.

Results of this study indicate that ‘internal market dynamics’ is positively connected to economic growth in middle-income countries. That is to say,

internal market dynamics generate positive influences on economic growth in middle-income economies. In dynamic markets, new corporates can be formulated easily, leading to high economic growth levels. Under the same line of reasoning, [Gomes et al. \(2022\)](#), [Matenda & Sibanda \(2022\)](#), and [Vatavu et al. \(2021\)](#) propounded that ‘internal market dynamics’ is positively related to economic growth. [Gomes, Ferreira & Lopes \(2023\)](#) opined that ‘internal market dynamics’ has a positive influence on economic growth in OECD economies (regardless of their income stages) and, particularly, in high-income countries, whereas having an adverse impact in upper-middle-income economies.

In contradiction to [Matenda & Sibanda \(2022\)](#), we exposed that ‘internal market openness’ has a negative impact on economic growth. Several middle-income economies deregulated and opened their internal markets with the aim of promoting efficiency and increasing economic growth. However, as the internal markets become more open, competition among companies becomes stiffer. Tough competition may reduce the profitability levels of corporates, resulting in a slowdown in economic growth. Our finding is supported by [Gomes et al. \(2022\)](#), who indicated that internal market openness has an adverse influence on economic growth in OECD economies. Nevertheless, [Gomes, Ferreira & Lopes \(2023\)](#) propounded that ‘internal market openness’ has a positive influence on economic growth in OECD economies, regardless of their income levels. Further, the authors indicated that ‘internal market openness’ has a positive impact on economic growth in high-income countries and a negative effect on economic growth in upper-middle-income countries.

In this study, we exposed that ‘physical and service infrastructure’ is positively related to economic growth in middle-income countries. This implies that corporates in middle-income countries are making use of the existing infrastructure, thereby increasing the levels of economic growth. [Gomes, Ferreira & Lopes \(2023\)](#) stated that ‘physical and service infrastructure’ has a positive effect on economic growth in OECD economies regardless of their levels of income, although their influence is superior in upper-middle-income countries. Our finding contracts the findings of [Matenda & Sibanda \(2022\)](#) and [Vatavu et al. \(2021\)](#). [Gomes et al. \(2022\)](#) discovered that ‘physical and service infrastructure’ positively influences economic growth in innovation-driven economies and adversely influences economic growth in transition-driven countries.

As in [Matenda & Sibanda \(2022\)](#) and [Vatavu et al. \(2021\)](#), we discovered that ‘cultural and social norms’ negatively impacts economic growth. [Matenda & Sibanda \(2022\)](#) indicated that cultural and social norms adversely influence entrepreneurs’ objectives of starting businesses, leading to a fall in entrepreneurship

pursuits and ultimately, a fall in economic growth. Pita, Costa & Moreira (2021) exposed that social and cultural norms discourage entrepreneurial initiatives. However, our finding is in contradiction with Gomes, Ferreira & Lopes (2023) and Gomes et al. (2022), who indicated that cultural and social norms have a positive influence on economic growth in OECD economies, irrespective of their development stages.

Finally, gross capital formation positively affects economic growth. This is not surprising since a high capital formation level results in an upsurge in productivity that encourages economic growth as propounded by the neoclassical synthesis (Onyinye, Idenyi & Ifeyinwa, 2017). Aslan & Altinoz (2021) and Ewubare & Ogbuagu (2015) are some of the authors who postulated that gross capital formation has a positive influence on economic growth. On the other hand, Stoica, Roman & Rusu (2020) articulated that gross capital formation has a significant, negative influence on economic growth. Ajose & Oyedokun (2018) discovered that there is an insignificant, adverse association between growth and capital formation. In line with the findings of Hjazeen, Seraj & Ozdeser (2021) and Stoica, Roman & Rusu (2020), unemployment rate has an adverse influence on economic growth in middle-income economies. That is to say, an upsurge in the unemployment rate results in a decline in economic growth. This is not surprising since a high unemployment rate is an indication that the economy is not using the labour resource efficiently.

6. CONCLUSIONS

This study implements correlation analysis and a fixed effects model to assess the influence of EFCs on economic growth in middle-income countries. The implemented panel data set for EFCs is unearthed from the GEM website and that for GDP per capita, a surrogate for economic growth, is extracted from the World Bank website over the observation period 2001 – 2021. We have discovered that there are statistically significant positive correlations between GDP per capita and ‘entrepreneurial finance’ and ‘post-school entrepreneurial education and training’, and statistically significant negative correlations between GDP per capita and ‘taxes and bureaucracy’, ‘internal market openness’ and ‘physical and service infrastructure’. Moreover, we expose that EFCs positively, significantly impact economic growth in middle-income countries.

This article contributes to the discourse on the connection between economic growth and conditions for entrepreneurship in middle-income economies. The findings of this assessment are vital because the nonexistence of evidence

regarding the determinants of entrepreneurship in middle-income countries can result in the designing of flawed entrepreneurship policies. These study findings can be generalised to other middle-income economies. As a recommendation, policymakers should consider EFCs when developing policies to kindle economic growth in middle-income economies. Also, the study results could assist policymakers in selecting and applying suitable measures to eradicate the impediments in the businesses where entrepreneurs operate. Further, the results are crucial for developing the effectiveness and efficiency of entrepreneurial ecosystems.

Even though the study has produced fascinating results, it has some limitations. First, the study only considered the EFCs. For future research, the study can be extended by including entrepreneurial behaviour and attitudes in addition to EFCs to get more insights into the impact of entrepreneurship on economic growth in middle-income economies. Second, several adopted variables had missing data, which to some degree may adversely affect the integrity of the study sample. This study used mean imputation to deal with the challenge of missing data. Sophisticated data imputation approaches can be applied in future to enhance the predictive ability of the designed models. Third, only fixed effects regression had been used to assess the connection between entrepreneurship and economic growth. Hence, more advanced techniques can be implemented to improve the forecasting capabilities of the models. Fourth, downturn conditions such as the COVID-19 pandemic and the Great Depression were not considered in this assessment. The influence of entrepreneurship on economic growth under downturn conditions is a challenge that needs to be assessed.

Conflict of interests

The authors declare there is no conflict of interest.

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ПРЕДУЗЕТНИЧКИ ОКВИРНИ УСЛОВИ И ЕКОНОМСКИ РАСТ: УВИД ИЗ ЕКОНОМИЈА СРЕДЊЕГ НИВОА ДОХОТКА

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САЖЕТАК

Овај чланак имплементира анализу корелације и модел фиксних ефеката за процјену утицаја предузетничких оквирних услова на економски раст у земљама са средњим нивоом дохотка. Примјени је скуп података панела за предузетничке оквирне услове је извучен са веб-странице Global Entrepreneurship Monitor, а за бруто домаћи производ (БДП) по глави становника, сурогат за економски раст, са веб-странице Свјетске банке током периода посматрања од 2001. до 2021. године. Утврђено је да постоје статистички значајне позитивне корелације између БДП-а по глави становника и „предузетничких финансија“ и „послијешколског предузетничког образовања и обуке“, те статистички значајне негативне корелације између БДП-а по глави становника и „пореза и бирократије“, „интерне тржишне отворености“ и „физичке и услужне инфраструктуре“. Штавише, откривено је да предузетнички оквирни услови позитивно и значајно утичу на економски раст у земљама са средњим нивоом дохотка.

Овај чланак доприноси дискурсу о повезаности економског раста и услова за предузетништво у привредама са средњим нивоом дохотка. Као препоруку, креатори политике треба да размотре предузетничке оквирне услове када развијају политике за подстицање економског раста у привредама са средњим нивоом дохотка. Надаље, резултати студије би могли да помогну креаторима политике у одабиру и примјени одговарајућих мјера за отклањање препрека у предузећима у којима предузетници послују.

Кључне ријечи: *предузетништво, економски раст, предузетнички оквирни услови, економије са средњим нивоом дохотка, корелациона анализа, модел фиксних ефеката.*