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Article

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Cogent Business & Management

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Suggested Citation: Sayed, Omer Ahmed; Abdelrahim, Selma Sidahmed (2024) : Economic freedom as a catalyst for entrepreneurship: an empirical analysis of GCC countries, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 11, Iss. 1, pp. 1-18, <https://doi.org/10.1080/23311975.2024.2304374>

This Version is available at:

<https://hdl.handle.net/10419/326008>

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To cite this article: Omer Ahmed Sayed & Selma Sidahmed Abdelrahim (2024) Economic freedom as a catalyst for entrepreneurship: an empirical analysis of GCC countries, Cogent Business & Management, 11:1, 2304374, DOI: [10.1080/23311975.2024.2304374](https://doi.org/10.1080/23311975.2024.2304374)

To link to this article: <https://doi.org/10.1080/23311975.2024.2304374>



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Published online: 29 Jan 2024.



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Economic freedom as a catalyst for entrepreneurship: an empirical analysis of GCC countries

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ABSTRACT

This research aims to investigate the impact of economic freedom on entrepreneurship within the GCC countries, spanning the period 2006–2020. Using the Panel ARDL methodology, the research analyzes the impact of economic freedom and its diverse components, including Property Rights, Government Integrity, Tax Burden, Government Spending, Business Freedom, Investment Freedom and Monetary Freedom on entrepreneurship rates, measured by new business density (REE). Additionally, critical control variables like GDP growth, inflation, unemployment and political stability were woven into the analysis. The findings highlight that while economic freedom is a consistent long-term catalyst for entrepreneurship, the short-term dynamics are influenced by many factors, with notable implications for GDP growth and political stability. Further dissection revealed that specific components of economic freedom, such as Tax Burden and Government Spending, held pronounced significance in shaping entrepreneurial inclinations. This research offers policymakers a nuanced understanding of how economic freedom, with its diverse components, shapes the entrepreneurial landscape in the GCC region, underscoring the importance of policies that factor in regional specificities. This research, also offers a detailed examination of individual economic freedom elements and their influence on entrepreneurial activity. This approach allows for providing a fresh perspective and contributing significantly to the existing literature.

IMPACT STATEMENT

This research provides a comprehensive analysis of the role of economic freedom in fostering entrepreneurship in the Gulf Cooperation Council (GCC) countries, covering the period from 2006 to 2020. By employing the Panel ARDL methodology, it delves into the impact of various components of economic freedom—including Property Rights, Government Integrity, Tax Burden, Government Spending, Business Freedom, Investment Freedom, and Monetary Freedom—on entrepreneurship rates, as measured by new business density. The study's findings emphasize that economic freedom is a consistent, long-term catalyst for entrepreneurship, with specific elements like Tax Burden and Government Spending playing a pronounced role in shaping entrepreneurial inclinations. The research highlights the critical role of these components in creating an optimal environment for entrepreneurship, thus offering nuanced insights and policy recommendations for the GCC region.

The detailed examination provided by this study enhances our understanding of how individual elements of economic freedom influence entrepreneurial activity over an extended period. It underscores the significance of Property Rights, Government Integrity, and other economic freedoms in fostering a supportive environment for entrepreneurship, crucial for economic diversification, innovation, and sustained growth in the GCC region. The findings suggest that enhancing each aspect of economic freedom is essential for creating a robust entrepreneurial ecosystem, calling for continual policy dialogue and refinement to eliminate barriers and support entrepreneurial success.

ARTICLE HISTORY

Received 24 October 2023

Revised 2 January 2024

Accepted 5 January 2024

KEYWORDS



Economic freedom; entrepreneurship; macroeconomic indicators; political stability; Gulf Cooperation Council (GCC); panel ARDL

JEL CLASSIFICATION

L26; E02; E24; O57

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1. Introduction

Entrepreneurship is increasingly being acknowledged as a vital force for economic growth and innovation. It acts as a catalyst for job creation, innovation and economic diversification. The concept of economic freedom significantly influences the situation in which entrepreneurship flourishes. Defined as the absence of economic oppression or constraints imposed by the state, economic freedom forms the foundation for entrepreneurial pursuits. However, its sophisticated relationship with entrepreneurship, particularly in the Gulf Cooperation Council (GCC)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates— context, warrants a more in-depth investigation.

At this research lies a crucial question: How does economic freedom affect entrepreneurship in the GCC countries? While global studies have a general consensus about the positive relationship between economic freedom and entrepreneurship, the GCC, with its unique political, economic and social structure, may offer distinct insights. Are specific components of economic freedom more influential than others in this region? Furthermore, how do these influences manifest in the short and long run?

Unravelling this relationship is of vital importance for multiple reasons. Firstly, the GCC countries actively promote entrepreneurial ecosystems in their bid to reduce oil dependence. Understanding the factors that can either boost or hinder this ambition is crucial. Secondly, as policymakers cope with economic diversification strategies, insights from this research can guide effective policy formulation, ensuring a robust entrepreneurial ecosystem.

The main objectives of this research can be framed as follows:

- Explore the Impact of Economic Freedom on Entrepreneurship
- Investigate the Impact of Different Components of Economic Freedom
- Provide Policy Recommendations based on empirical findings.

To accomplish these objectives and validate the hypotheses, the research employed a rigorous analytical approach using the Panel ARDL model. This model stands out for its ability to capture both long-term cointegration relationships and short-term fluctuations, providing a holistic view of the dynamics between economic freedom and entrepreneurship.

This research enhances the understanding of economic freedom's impact on entrepreneurship in the GCC region. By utilizing Panel ARDL methodology, our analysis offers a detailed examination of individual economic freedom elements and their influence on entrepreneurial activity over an extended period (2006–2020). This approach allows for nuanced insights and specific policy recommendations, providing a fresh perspective and contributing significantly to the existing literature.

This article is structured into multiple segments to offer a thorough examination. Following this introductory section, the first section includes an extensive literature review that clarifies the theoretical foundation and identifies unexplored areas in existing scholarship. After the literature review, the section on methodology describes the techniques employed for gathering data, features of the sample and the statistical methods used for analysis. The ensuing section on results delves into the empirical outcomes, comparing them to established research. The article concludes by summarizing essential findings, their relevance for policy and recommendations for future investigations.

2. Literature review

Before delving into our research's empirical findings and intricacies, it's pivotal to place our research within the broader intellectual context.

2.1. Theoretical framework of entrepreneurship and economic freedom

Entrepreneurship has been widely acknowledged as a vital force for economic growth and development (Schumpeter, 1934; Shane, 2003). Similarly, economic freedom, which pertains to individuals' autonomy in conducting economic activities, has also been shown to impact entrepreneurial activity positively (Gwartney et al., 2004). Classical Economic Theory Suggests that laissez-faire or "free markets" foster

economic growth and entrepreneurship. In this line, economic freedom positively correlates with entrepreneurship as described -Adam Smith's "The Wealth of Nations".

The relationship between new business density (REE) and economic freedom (EF) is also supported by institutional theory, which posits that formal institutions like laws and policies influence entrepreneurial activities (North, 1990), furthermore, Bradley and Klein (2016) underscored the importance of institutions in this dynamic, suggesting a similar influence in the GCC context. A direct correlation exists between economic freedom and entrepreneurial activity, as indicated by Sweidan (2022) who illustrated that economic freedom significantly influences the entrepreneurship rate in U.S. states after the Great Recession. Countries prioritizing economic freedom tend to foster a more vibrant entrepreneurial ecosystem (Gwartney et al., 2014). The findings from Acs et al. (2018) align, substantiating that economic freedom, examined through an ecosystem perspective, significantly influences entrepreneurship and economic growth. These findings concord with Angulo-Guerrero et al. (2017), whose analysis of OECD countries demonstrated that economic freedom plays a pivotal role in shaping both opportunity and necessity entrepreneurship. Méndez-Picazo et al. (2021) emphasized the role of socio-cultural factors alongside economic freedom in shaping social entrepreneurship, a perspective that could be particularly relevant given the unique socio-cultural dynamics of the GCC region.

Economic freedom, as measured by property rights, money, free trade, regulatory efficiency and the absence of corruption, directly contributes to more significant entrepreneurial opportunities and motivations (Ajide, 2021). Acs et al. (2008) further underline that nations with greater economic freedom exhibit higher innovation and entrepreneurial activity levels. Their findings suggest that economic freedom not only influences the quantity of entrepreneurship but also the quality. Moreover, the studies conducted by Carlos Díaz-Casero et al. (2012) and Kuckertz et al. (2016) highlight the positive correlation between economic freedom and entrepreneurial activity. These studies emphasize how economic freedom, characterized by regulatory efficiency and the absence of corruption, creates an environment conducive to entrepreneurship, validating the assertions of McMullen et al. (2008) and Sobel (2015).

2.2. Components of economic freedom

Entrepreneurship is crucial for fostering economic growth and development, reflecting the conceptualizations of Schumpeter (1934) and Shane (2003). This entrepreneurial spirit is deeply intertwined with the notion of economic freedom, as detailed in classic economic works Smith's "The Wealth of Nations" (1776) and later discussions by Gwartney et al. (2004). The Economic Freedom Index (EFI), which encompasses elements such as Property Rights (PR), Government Integrity (GI), Tax Burden (T.B.), Government Spending (GS), Business Freedom (BF), Labor Freedom (LF) and Monetary Freedom (MF), offers quantifiable measure of economic freedom. Such a measure becomes instrumental in deciphering numerous ways how economic freedom can influence entrepreneurial pursuits, as The Heritage Foundation (2021) has pointed out.

Prasetyo and Kistanti (2020) and Ghosh (2017) shed light on the role of institutional economics and the different facets of economic freedom, such as regulatory dynamics, in shaping entrepreneurial aspirations and promoting robust and sustainable economic expansion. Importantly, each aspect of economic freedom exerts unique effects on entrepreneurial ventures, emphasizing the multifaceted nature of their relationship.

2.2.1. Property rights (PR)

As detailed by Redford (2020) and Purwaningsih (2019), they are instrumental in fostering entrepreneurship offering a sense of security and facilitating economic transactions, thereby reducing uncertainties related to asset ownership. Playing a pivotal role enabling entrepreneurship by securing intellectual properties, as emphasized by Iqbal Hussain et al. (2021).

2.2.2. Government integrity (GI)

Underlines the importance of an honest government supporting fair business competition and encouraging people to start and grow their businesses. Prasetyo and Kistanti (2020) and Kamarudin et al. (2021) stress the role of such government integrity in creating a strong and sustainable economy.

2.2.3. Tax burden (TB) and government spending (GS)

Tax burden (TB) and government spending (GS) uniquely impact entrepreneurship. Studies like Udimal et al. (2020) and Lungu and Claudiu (2021) suggest that tax structures and government expenditures significantly shape the entrepreneurial environment, with efficient spending and lower tax burden as catalysts for entrepreneurial spirit.

2.2.4. Business freedom (BF) and Labor freedom (LF)

Bjørnskov and Foss (2008) investigate the relationship between business freedom—defined by decreasing regulatory constraints—and the stimulation of entrepreneurial endeavours. They highlight the positive effect of lower and less rigid regulations to inspire initiatives in entrepreneurship (Bjørnskov and Juul Foss, 2010). Similarly the impact of labour market regulations on entrepreneurial ecosystems, influencing businesses' inception and endurance and shed light on how the regulatory environment surrounding labour affects the entrepreneurial landscape and the sustainability of enterprises (Botero et al., 2004). Moreover, Popa et al. (2022) and Darnihamedani and Terjesen (2020) provide further insights into the interactions between business and labour freedom in entrepreneurship. They emphasize the significance of a relaxed regulatory framework in business and labour domains, positing that it can be pivotal in fostering entrepreneurial initiatives. According to these studies, less restrictive rules and regulations in these realms enhance enterprises' feasibility and sustainability by cultivating a favourable atmosphere for entrepreneurial activities. This suggests that business and labour freedoms are crucial in nurturing and sustaining entrepreneurial innovations and developments.

2.2.5. Monetary freedom (MF)

Economou (2019) highlighted the asymmetric crisis effects on FDI inflows due to economic freedom, illustrating the importance of monetary stability and predictability in promoting entrepreneurship.

2.3. Macroeconomic factors and entrepreneurship

GDP growth has been seen as both a sign of and a consequence of increased entrepreneurship. Audretsch and Keilbach (2004) and Acs and Szerb (2007) study A positive feedback loop between GDP growth and entrepreneurship, according to Carree and Thurik (2008), exists in which greater entrepreneurial activity drives economic growth, which in turn encourages more entrepreneurial activity.

In line with the influence of macroeconomic factors on entrepreneurship, Ersin and Karakeçe (2023) demonstrated the significant impact of these factors in E7 countries, suggesting a potential parallel in the GCC region. Dileo and García Pereiro (2019) provided a comparative perspective, analyzing how individual and contextual factors jointly influence entrepreneurial activities, an approach that resonates with the multi-dimensional nature of entrepreneurship in GCC countries. The work of Patel and Wolfe (2023) on public administration's role in entrepreneurship offer broader, global perspectives that can be contrasted with the GCC-specific findings of our research. Additionally, the exploration of trade openness and financial development by Mohamed Sghaier (2023) in North African countries can offer a comparative regional insight, potentially relevant to the GCC context.

Inflation and unemployment have been viewed as critical macroeconomic factors influencing entrepreneurial activity. Inflation presents a complex relationship with entrepreneurship. Some studies suggest that moderate inflation may spur entrepreneurial activities leading to higher expected returns (Parker, 2009), while others argue that high inflation hampers entrepreneurship due to uncertainty and increased costs (Naudé, 2011).

Baptista et al. (2008) note that regions with high unemployment rates show a surge in "necessity entrepreneurship" as individuals seek alternative livelihood sources. Whereas the relationship between unemployment and opportunity entrepreneurship is nuanced and varies depending on the economic context and individual motivations. Generally, opportunity entrepreneurship is characterized by individuals pursuing business ventures based on identified market opportunities, rather than out of necessity due to unemployment (Thurik et al., 2008). Fairlie and Fossen (2020) provided a clear distinction between opportunity and necessity entrepreneurship. This differentiation is crucial in the

GCC context, where economic structures and employment patterns might lead to varied forms of entrepreneurship.

Also, they suggest that high unemployment rates can discourage entrepreneurial activity due to reduced economic stability or encourage it as more people seek self-employment as an alternative to increasing unemployment.

2.4. Political stability and entrepreneurship

Political stability plays a crucial role in fostering entrepreneurship by providing a stable environment where businesses can operate (Aidis et al., 2008). A robust and stable political environment serves as a foundation for entrepreneurial ventures. Bjørnskov and Foss (2010) argue that political stability promotes entrepreneurship by ensuring predictability of business operations, reducing uncertainties and safeguarding property rights. While unstable political conditions discourage entrepreneurial activity and business starts introducing uncertainties that obstruct business starts and growth and long-term sustainability (Wennekers et al., 2010).

2.5. Entrepreneurship in GCC countries

Entrepreneurship the GCC countries presents distinct characteristics shaped by elements like oil dependency, a predominantly young workforce, and swift socio-economic transitions, as highlighted by Jamali (2009). Research works such Magd and Khan (2022) and Hamdan et al. (2020) accentuate the integral role that entrepreneurial initiatives play in spurring economic development and evolution within these countries and the Region. The research by Saberi and Hamdan (2019) illuminates governmental support's pivotal role consolidating the relationship between entrepreneurship and economic growth GCC countries. This suggests a requisite for an intricate and contextual comprehension of the interplay between economic freedom and entrepreneurship this specific geopolitical framework. The research contributes a dimension to facilitate understanding how government involvement and support the national can significantly shape entrepreneurship's trajectory in relation to economic advancement. Moreover, the empirical insights emerging from the GCC regions, supported by the findings of Alexandre and Kharabsheh (2019) and Mathew (2019), emphasize the dynamically evolving nature of entrepreneurship in. These features underline the importance of a detailed exploration further understanding how essential elements of economic freedom interact and align with entrepreneurial ventures. Ciftci and Durusu-Ciftci (2022) explored how different components of economic freedom, such as foreign direct investment, influence economic growth. This study's findings can shed light on the nuanced ways in which economic freedom components affect entrepreneurship in the GCC. Dempere and Pauceanu (2022) examined how various economic-related freedoms impact national entrepreneurial activity. This study's insights are directly relevant to understanding the GCC's entrepreneurial landscape, suggesting that certain freedoms may be more influential than others.

Urbano et al. (2023) analyzed the effect of institutions on intrapreneurship in developed versus developing countries. This study's findings can be instrumental in understanding the institutional dynamics within the GCC and their impact on entrepreneurial activities within established organizations.

Darwish et al. (2020) and Aminova et al. (2020) discussed the entrepreneurship ecosystem in GCC and the Arab World, respectively. These insights are particularly pertinent to our research, given the unique characteristics of the entrepreneurship ecosystem within the GCC, marked by rapid socio-economic changes and evolving government policies.

In recent years, countries in the GCC have significantly advanced in developing robust EEs. Initiatives such as Saudi Arabia's Vision 2030 and the UAE's National Innovation Strategy exemplify the region's commitment to fostering an environment supportive of entrepreneurial activities. These strategies focus on diversifying economies, enhancing the role of the private sector, and nurturing innovation. According to Ács et al. (2016), GCC countries have undertaken various measures to enhance their EEs, including:

- Regulatory Reforms: Streamlining business registration, offering tax benefits, and establishing special economic zones to attract entrepreneurs.

- Access to Capital: Creating state-backed venture capital funds and encouraging private sector investment in startups.
- Education and Mentorship: Investing in entrepreneurial education and training programs within academic institutions and communities.
- Networking Opportunities: Facilitating connections between entrepreneurs, investors, and industry experts.

Furthermore, the evaluations by Khan et al. (2021) and Syed et al. (2023) offer additional perspectives, focusing on the resilience and development of entrepreneurship in universities across the GCC countries, respectively. Education, encompassing all levels and not just higher education, plays a crucial role in fostering entrepreneurial activity. A well-functioning educational system is instrumental in nurturing entrepreneurial skills, innovation, and a mindset conducive to business creation and growth (Hanushek & Woessmann, 2023). These studies contribute to the expanding knowledge base, showcasing the diversity and adaptability of entrepreneurial endeavours in response to unique regional influences and global challenges such as the COVID-19 pandemic.

According to Dutta et al. (2020), the COVID-19 pandemic has had far-reaching impacts on global economies, including those in the GCC region. The pandemic's disruption to economic activities is profound, with significant implications for entrepreneurship within these countries.

- Economic Slowdown: The GCC countries experienced an economic slowdown due to the pandemic, primarily resulting from reduced global oil demand and prices, travel restrictions, and disruptions in supply chains. This slowdown impacted the overall economic environment in which businesses operate, influencing entrepreneurial activities.
- Shift in Entrepreneurial Focus: Entrepreneurs in the GCC region adapted to the new challenges by shifting their business models and strategies. There was a noticeable increase in digital entrepreneurship, with businesses moving online to cater to the changing consumer behaviors during lockdowns and social distancing measures.
- Government Response and Support: In response to the pandemic, GCC governments implemented various measures to support businesses. These included financial aid, tax reliefs and regulatory relaxations, which helped cushion the impact on entrepreneurs and small businesses.
- Long-term Implications: The pandemic also accelerated certain trends, such as digital transformation and e-commerce, which are likely to have long-lasting effects on the entrepreneurial landscape in the GCC region. This shift presents both challenges and opportunities for entrepreneurs.

Regarding the role of economic freedom in catalyzing entrepreneurship within the GCC region, it is imperative to consider the emergence and development of Entrepreneurship Ecosystems (EE). These ecosystems encompass a variety of elements, including access to finance, supportive government policies, a culture that encourages entrepreneurial endeavors, market conditions conducive to business growth, and availability of support services such as mentoring and training (Ács et al., 2016).

2.6. Literature gap and hypotheses

While the existing literature offers extensive insights into the relationship between economic freedom and entrepreneurship, a noticeable paucity exists in the detailed exploration of the individual components of the Economic Freedom Index (EFI) and their unique relationships with entrepreneurship, particularly in the context of GCC countries.

Firstly, much literature treats economic freedom as a monolithic entity without sufficiently dissecting its intricate components. Studies like Gwartney et al. (2004) and North (1990) offer comprehensive perspectives yet need to delve deeper into important impacts of specific EFI components such as Property Rights (PR) and Monetary Freedom (MF) on entrepreneurship.

Secondly, the socio-cultural, economic and political fabric of GCC countries, characterized by oil dependency, socio-economic transitions and demographic shifts, implies that the dynamics of economic freedom manifest differently than in other world regions. Existing studies, by Jamali (2009) and Yusuf (2012), touch upon entrepreneurship in GCC but seldom examine the influence of individual EFI components within this unique milieu.

Lastly, much of the current discourse focuses predominantly on macroeconomic variables, such as GDP growth, inflation and unemployment, relegating potentially pivotal roles of factors like Business Freedom (BF) and Labor Freedom (LF) in influencing entrepreneurship in the GCC landscape.

This research aims to bridge this gap by exploration of exploring the relationships between individual components of EFI and entrepreneurship in GCC countries, with the purpose to add depth and specificity to the extant body of knowledge. Motivating the following hypothesis:

H1: Economic freedom (EF) has significant positive impacts on entrepreneurship development in GCC countries.

H2: Each component of the Economic Freedom Index Property Rights (PR), Government Spending (GS), Business Freedom (BF), Labor Freedom (LF), Monetary Freedom (MF) individually has a significant impact on entrepreneurship in GCC countries.

3. Methodological framework

This section provides a comprehensive overview of the methodological underpinnings that support this research. Since entrepreneurship is a complex multidimensional phenomenon, the analysis requires rigorous approach. The diversity of the economies and geopolitical settings of the countries in the GCC provides a uniquely platform to analyze and understand the dynamics of entrepreneurship.

Given the critical role of entrepreneurship in economic development and social transformation, this research aims to unveil economic freedom and other macroeconomic and political variables that significantly influence entrepreneurial activities in the GCC region. To this end, this section is divided into three sections, each fulfilling a specific role in our research design.

Initially, an exposition of descriptive statistics will be provided on macroeconomic indicators to familiarize one with the similarities and differences among the GCC countries (Table 1).

The first section aims to build the empirical foundation of the research, detailing the data sources and types of data utilized. The second section delves into the theoretical formulations, specifying the equations and variables that constitute our analytical framework. The last section outlines the methodological approach, providing insights into the Panel Autoregressive Distributed Lag (ARDL) methodology utilized for data analysis.

3.1. Data coverage and sources

In this comprehensive analysis, the focal point is understanding the trends and influences that shape entrepreneurship in the GCC countries. The research adopts a multi-year approach with longitudinal data from 2006 to 2020. The data set, consisting of 88 observations, amalgamates several key macroeconomic indicators essential for a relevant understanding of entrepreneurship.

The scope of data includes Entrepreneurship Rate (REE), measured as new density where this variable serves as dependent variable and gauges the level of entrepreneurial activity in the GCC region. Macroeconomic Variables in this research include Economic Freedom (EF), Growth in Gross Domestic Product (GGDP), Inflation Rate (INF), Unemployment Rate (UN), and Political Stability (PS).

The data is sourced from several internationally recognized databases and organizations to ensure credibility and comprehensiveness, including the World Bank World Development Indicators, the

Table 1. Descriptive statistics about macroeconomics indicators for GCC.

	Population million (UN)	Nominal GDP, US\$, billions	CPI Inflation Rate, average, %	Government Revenues, % GDP	Government Expenditures, % GDP
	2023			2021	
Bahrain	1.47 M	37	1.5	23.8	32.2
Kuwait	4.27M	165	2.4	22.0	46.3
OMAN	4.58M	81	3.1	31.5	34.3
QATAR	2.70M	168	1.0	33.9	34.8
Saudi Arabia	36.41 M	768	3.3	31.0	34.7
United Arab Emirates	9.44 M	435	−0.2	29.7	31.0

Source: World Bank reports.

International Monetary Fund's World Economic Outlook Database (IMF, 2006–2021), the Heritage Foundation's Index of Economic Freedom, Fraser Institute annual reports, and the Central Statistical Organization of GCC countries (2016–2021).

3.2. Model specifications and variable definitions

The Panel Autoregressive Distributed Lag (ARDL) model provides analytical lens for this research (Table 2). The main equation that guides this research is formulated as follows:

$$REE_t = \alpha + \beta_1 GGDP_t + \beta_2 EF_t + \beta_3 INF_t + \beta_4 UN_t + \beta_5 PS_t + \varepsilon_t \quad (1)$$

- Dependent Variable: Entrepreneurship Rate (REE)
- Independent Variables: GDP growth (GGDP), Economic Freedom (EF), Inflation Rate (INF), Unemployment Rate (UN) and Political Stability (PS).

Then, we use the same equation to formulate Economic Freedom component models by substituting seven components of EF instead of the main index of EF. These components include Monetary Freedom (MF), Investment Freedom (IF), Business Freedom (BF), Government Spending (GS), Tax Burden (TB), Property Rights (PR) and Government Integrity (GI). Each of these components contributes to the overall economic freedom score, and their individual impacts on entrepreneurship are considered in our econometric analyses. This clarification provides necessary context for understanding the structure of the data and guides the subsequent econometric examination of the relationship between economic freedom and entrepreneurship.

3.3. Methodological approach

To unearth the nuances of the relationships between D(EE) and its independent variables, the research harnesses the potency of ARDL (Autoregressive Distributed Lag) method (Pesaran & Shin, 1999). The ARDL approach is renowned for delineating both the short-term dynamics and the long-term equilibrium relationships among variables.

Various statistical tests are used to ensure the rigours of our analysis. The Jarque-Bera test ascertains normality of the residuals, a fundamental assumption in many statistical models (Jarque & Bera, 1987). Additionally, skewness, kurtosis and standard deviation metrics are examined, offering comprehensive insights into dataset's distribution attributes (Stuart & Ord, 2010).

The methodological structure, fortified with the ARDL approach and a statistical test suite, assures the research findings' validity and depth.

4. Empirical results and analysis

This section is dedicated to the presentation and analysis of the empirical results derived from the Panel ARDL model applied to data collected from 2006 to 2020 in GCC countries, by using EViews 12. The analysis aims to investigate the impact of economic freedom (EF) and other macroeconomic variables like growth in GDP (GGDP), inflation (INF), unemployment (UN), and political stability on the dependent variable, entrepreneurship, which is measured by new density (REE).

Table 2. Variables of research.

Variable	Definition	Source
Entrepreneurship Rate (REE)	Quantified as New Density, measures emergence of new firms in each period.	https://databank.worldbank.org/
GDP growth (GGDP)	Reflects rate of economic growth	https://databank.worldbank.org/
Economic Freedom (EF):	Gauges the level of economic liberties and rights.	https://www.heritage.org/index
Inflation Rate (INF)	Represents annual percentage change in the general	https://databank.worldbank.org/
Unemployment Rate (UN)	Measures percentage of unemployment in the workforce.	https://databank.worldbank.org/
Political Stability (PS)	Assesses stability and security of the political	https://databank.worldbank.org/

Table 3. Descriptive statistics.

Statistic	Entrepreneurship (REE)	Economic Freedom (EF)	Growth in GDP (GGDP)	Inflation (INF)	Unemployment (UN)	Political Stability (PS)
Mean	2.08	67.50	3.69	2.75	2.54	0.07
Median	1.74	67.04	3.37	2.33	2.16	-0.14
Maximum	7.75	77.70	26.17	15.05	7.45	1.22
Minimum	0.21	59.60	-8.86	-4.86	0.10	-1.34
Std. Dev.	1.64	4.90	5.46	3.47	1.84	0.77
Skewness	1.48	0.40	1.10	1.43	0.69	-0.10
Kurtosis	5.14	2.08	6.44	6.11	2.48	1.51
Jarque-Bera	48.96	5.40	61.36	65.46	7.97	8.33
Probability	0.00	0.07	0.00	0.00	0.02	0.02
Sum	183.03	5939.89	325.13	242.42	223.61	5.81
Sum Sq. Dev.	234.69	2092.20	2595.77	1044.57	296.00	52.08

4.1. Descriptive statistics

This sub-section focuses on descriptive statistics, a foundational step in empirical analysis. Descriptive statistics serve multiple purposes to offer a succinct summary of central tendency of every variable, dispersion, and shape of the dataset's distribution and provide crucial context, enabling understanding the data's structure facilitating and informed decisions about subsequent econometric analyses.

Table 3 present key statistical measures including the mean, median, standard deviation, for each variable under investigation. This set the stage for deeper analyses, offering initial insights into the data and revealing patterns or anomalies that warrant further scrutiny.

Entrepreneurship (REE): The average level of entrepreneurship, measured by new density, is 2.08.

The data has a standard deviation of 1.64, indicating the spread of the data points around the mean.

The positive skewness value suggests that the distribution is skewed to the right, meaning that there are some higher outlier values. The Jarque-Bera test statistic and the associated probability value near zero suggest that the distribution is not normal.

Economic Freedom (E.F.): The average level of economic freedom is 67.50The data has a smaller standard deviation, suggesting that the data points are generally close to the mean.

The distribution is mildly skewed to the right.

Growth in GDP (GGDP): The average GDP growth rate is 3.69%. The high standard deviation suggests considerable variability in GDP growth rates among GCC countries. The distribution is skewed to the right, indicating outlier high growth rates.

Inflation (INF): The average inflation rate is 2.75%. The data has a moderate standard deviation, indicating a reasonable spread around the mean. The positive skewness suggests that the distribution is skewed to the right because of some periods of high inflation.

Unemployment (UN): The average unemployment rate is 2.54. The data shows moderate variability around the mean unemployment rate. The distribution is skewed to the right but less so than other variables.

Political Stability (PS): The average score for political stability is near zero, suggesting that this measure varies around a neutral point. The data has moderate variability. The distribution is symmetric, as the skewness value is close to zero.

4.2. Unit root tests

Before proceeding to the main econometric analyses of our research, it is imperative to establish the stationarity of the time series data used. Unit Root Tests are the cornerstone for this purpose, ensuring that our dataset satisfies the preconditions required for rigorous, unbiased, and efficient econometric estimations. Failing to account for unit roots may show misleading or spurious results, jeopardizing the validity and reliability of research's conclusions.

In Table 4, we employ well-established unit root tests to evaluate stationarity of each variable in our dataset. Specifically, we utilize as Levin, Lin & Chu t, Im, Pesaran and Shin W-statthe, Augmented Dickey-Fuller (ADF) and Phillips-Perron tests to affirm the nature of this time series data. These tests provide insights whether differencing, transformations or any other adjustments are required to make the data stationary.

Table 4. Unit root tests results.

Method	D(REE)	D(EF)	D(GGDP)	D(INF)	D(UN)	D(PS)
Levin, Lin & Chu	5.09 (0.0000)	-2.66 (0.0039)	-8.54 (0.0000)	-13.22 (0.0000)	-3.18 (0.0007)	-0.17 (0.4315)
Im, Pesaran and Shin W-stat	-4.14 (0.0000)	-2.58 (0.0049)	-6.11 (0.0000)	-9.07 (0.0000)	-2.73 (0.0032)	-2.22 (0.0131)
ADF - Fisher	39.26	26.86 (0.0081)	55.49 (0.0000)	76.33 (0.0000)	31.64 (0.0016)	24.67 (0.0164)
Chi-square	(0.0001)					
P.P. - Fisher	50.96 (0.0000)	53.68 (0.0000)	68.21 (0.0000)	99.29 (0.0000)	14.27 (0.2839)	65.93 (0.0000)
Chi-square						

D(REE): All tests reject the null hypothesis of a unit root, suggesting that the series is stationary.

D(EF): All tests reject the null hypothesis of a unit root, indicating that the series is stationary.

D(GGDP): All tests reject the null hypothesis of a unit root, showing strong evidence for stationarity.

D(INF): All tests reject the null hypothesis of a unit root, indicating a stationary series.

D(UN): Most tests reject the null hypothesis except for P.P. - Fisher Chi-square, suggesting that the series might be stationary, but caution is advised.

D(PS): Tests show mixed results, Levin, Lin & Chu do not reject the null hypothesis while the others do, indicating that further investigation is required for this series.

Most series are stationary using multiple methods, fulfilling key assumptions for further time-series modelling. Particular caution is needed for series D(UN) and D(PS) as some tests do not reject the null hypothesis of a unit root.

These results provide confidence for applying ARDL models for long-term relationship analysis.

4.3. The main model: long-run and short-run analysis

After establishing the stationarity of our dataset and confirming that variables are well-suited for econometric analysis, the subsequent step is to delve into the heart of our research, analyzing the long-run and short-run relationships among the variables in the main model, which includes the economic freedom index. The distinction between long-run and short-run effects is crucial in economics and finance, as some variables may exhibit a quick adjustment to changes. In contrast, others may take time to react to similar shifts.

In the Long-Run Analysis sub-section, we aim to investigate the enduring relationships and equilibrium states among key variables. Specifically, this part focuses on changes in macroeconomic variables such as GDP growth, inflation, unemployment, economic freedom, and political stability affect entrepreneurship in the GCC countries over an extended period.

In the Short-Run Analysis sub-section, our focus shifts to capturing the dynamic adjustments that occur when there is a disturbance to the equilibrium state. This includes how swiftly the dependent and independent variables adjust to changes in the short term.

Both long-run and short-run analyses, as shown in Table 5, providing holistic insights into the complex dynamics affecting entrepreneurship in the GCC. This comprehensive approach allows to make nuanced policy recommendations, offering immediate and long-term strategies for fostering entrepreneurial activity.

4.3.1. Model diagnostics

Model metrics such as Root MSE and AIC provide insights into the model's adequacy. Their interpretation should be juxtaposed with similar models for a more thorough evaluation (Burnham & Anderson, 2004). The Root MSE is relatively low, and the difference between the S.D. of the dependent variable and the S.E. of regression is not vast, which suggests that the model fits the data reasonably well.

The Akaike info criterion and Schwarz criterion values can be used for model comparison, though without other models for comparison in this context, their absolute values provide limited insights.

4.3.2. Long-run equation

Economic Freedom (EF) from Table 5 shows a significant positive coefficient indicating that increases in economic freedom are associated with higher entrepreneurship rates in the long run. This aligns with economic theories that suggest economic freedom is conducive to entrepreneurial activities (Acs et al., 2008); also these findings align with those of McMullen et al. (2008), suggesting that countries with higher economic freedom tend to exhibit higher levels of entrepreneurship.

Table 5. Basic model ARDL estimation: long and short run coefficients.

Equation	Variable	Coefficient	Std. Error	t-Statistic	Prob
Long Run	GGDP	0.013	0.003	4.210	0.000
	EF	0.111	0.010	11.119	0.000
	INF	0.039	0.003	12.100	0.000
	UN	-0.363	0.038	-9.572	0.000
	PS	0.348	0.067	5.163	0.000
Short Run	COINTEQ01	-0.623	0.337	-1.848	0.073
	D (REE (-1))	0.643	0.409	1.569	0.126
	D(GGDP)	0.061	0.043	1.435	0.160
	D(EF)	-0.001	0.064	-0.010	0.992
	D(INF)	-0.052	0.046	-1.138	0.263
	D(UN)	1.107	0.660	1.678	0.102
	D(PS)	-1.273	1.109	-1.149	0.259
	C	-3.074	1.669	-1.841	0.074

Growth in GDP (GGDP) shows a positive association. It suggests that economic growth fosters entrepreneurship, likely due to new business opportunities in a growing economy (Wennekers et al., 2005).

Inflation (INF) shows a positive relationship here, which is somewhat surprising, as inflation is typically considered detrimental to business activities. However, Braunerhjelm and Eklund (2014) suggest that the effect of inflation on entrepreneurship can be nuanced, depending on other macroeconomic factors. Our positive coefficient contrasts with general findings (Audretsch & Keilbach, 2007). The unique inflationary dynamics in the GCC, driven by oil revenues and other factors, might explain.

Unemployment (UN) shows a negative relationship that aligns with the "discouraged worker effect", where high unemployment can suppress entrepreneurial intentions (Blanchard and Wolfers, 2000). The findings diverge somewhat from those of Acs et al. (2008), who discusses the idea of "necessity entrepreneurship" where higher rates unemployment could drive entrepreneurial activity. However, the GCC's unique economic makeup might offer an alternative perspective.

Lastly, Political Stability (PS) has a positive coefficient, indicating that political stability supports entrepreneurial activities. This is consistent with findings from Bjørnskov and Foss (2016) that political stability reduces uncertainties impacting the entrepreneurial environment. Bjørnskov and Foss (2016) also underscore the positive impact of political stability on entrepreneurship, resonating with our results.

4.3.3. Short-run equation and cointegration tests

The short-run equation in our Panel ARDL model reveals some intriguing immediate impacts of macroeconomic variables on new enterprise density (REE) within the GCC region for the period 2008–2020. According to our selected model ARDL (2, 1, 1, 1, 1, 1), the coefficients indicate varying degrees of significance for GDP growth (GGDP), inflation (INF), unemployment (UN), economic freedom (EF), and political stability (PS).

Interestingly, our findings show that unemployment (UN) has a significant positive short-term impact on REE, with a coefficient of 1.107443. This contradicts conventional wisdom and demands further research. In contrast, variables like GGDP and INF did not show a significant short-term influence.

The coefficient of COINTEQ01, which represents the error correction term, is negative, as expected, implying a correction mechanism. However, its p-value is slightly above the traditional threshold (0.073), making it marginally significant.

Our findings align with Pesaran and Shin (1999), who utilized ARDL to determine long-term relationships among macroeconomic variables. However, our research expands on their methodology by incorporating newer variables like economic freedom and political stability, showing them to be significant in determining REE in the long term.

4.4. The components models: long-run and short-run analysis

To determine the impact of various components of economic freedom (EF) on entrepreneurship in the GCC for the period between 2006 and 2020, we have ARDL model estimations for multiple regressions focusing on individual components of EF as illustrated in Table 6. Economic freedom component refers to different aspects such as MF (Monetary Freedom), IF (Investment Freedom), BF (Business Freedom), GS

Table 6. Components models ARDL estimation: long and short run coefficients.

Variable	Model with Monetary Freedom (MF)	Model with Investment Freedom (IF)	Model with Business Freedom (BF)	Model with Government Spending (GS)	Model with Tax Burden (TB)
	Coef (p-value)	Coef (p-value)	Coef (p-value)	Coef (p-value)	Coef (p-value)
<i>Long run equation</i>					
EF Component	0.017 (0.0004)	0.026 (0.0008)	0.015 (0.2561)	0.008 (0.0274)	−0.468 (0.0000)
GGDP	−0.001 (0.9199)	0.015 (0.0025)	−0.259 (0.0000)	0.000 (0.9458)	−0.005 (0.7488)
UN	0.160 (0.0000)	−0.298 (0.0027)	−1.677 (0.0001)	0.047 (0.4317)	−1.043 (0.0298)
INF	0.016 (0.0035)	0.017 (0.0011)	−0.205 (0.0044)	−0.059 (0.0000)	−0.121 (0.0001)
PS	−0.509 (0.0001)	0.659 (0.0047)	−1.005 (0.0550)	0.824 (0.0137)	1.443 (0.0006)
<i>Short run equation</i>					
COINTEQ01	−0.547 (0.2327)	−0.410 (0.2265)	−0.308 (0.0093)	−0.164 (0.5777)	−0.263 (0.2742)
D (REE (−1))	0.571 (0.1198)	0.565 (0.2462)	0.460 (0.0966)	0.464 (0.1415)	0.541 (0.2030)

(Government Spending), TB (Tax Burden), PR (Property Rights) and GI (Government Integrity). Below is a brief analysis, comparison, and alignment with other studies:

4.4.1 Monetary freedom (MF) model

In the Long Run Equation, significant positive relationships are observed between MF, UN. (Unemployment), and INF (Inflation). PS (Political Stability) shows significant negative relationship. The positive relationship between entrepreneurship and monetary freedom might suggest that entrepreneurship thrives in less restrictive as monetary policy environments. The significant coefficient of UN is intriguing and could be interpreted as higher unemployment driving individuals to create new businesses. In the Short Run Equation, no variables are statistically significant at conventional levels (typically 5% or 10%). However, D (REE (−1)) and D(INF) are close to being significant. This aligns with Gwartney et al. (2022), and McMullen et al. (2008), who suggesting that monetary policies have a nuanced relationship with entrepreneurship, especially in the long run.

4.4.2 Labor freedom (LF) model

Significant positive relationships between LF, GGDP (Growth in GDP), and INF are shown in the Long Run Equation. U.N. and P.S. are negatively related. Labour freedom might indicate greater support entrepreneurship as more flexible Labour markets enable easier hiring processes. In the Short Run Equation, only D(GGDP) and C (Constant) are statistically significant. The importance of labour freedom to entrepreneurship has been highlighted in various studies, and especially in developing market economies.

4.4.3. Business freedom (BF) model

GGDP, UN and INF are statistically significant in the Long Run Equation. Only BF does not significantly predict REE, a surprising result since it would be expected business freedom be closely tied to entrepreneurship. While in the Short Run Equation, COINTEQ01, D(GGDP) and D(INF) are significant. Numerous studies posit a strong correlation between business freedom and entrepreneurship, suggesting that easing business operations boosts entrepreneurship (Klapper et al., 2006; Acs et al., 2008).

4.4.4. Government spending (GS) model

In the Long Run Equation, GS and INF are positive and significant, whereas PS is negatively related. In the Short Run Equation, none of the variables are statistically significant. The significant coefficient of GS suggests that increased government spending, probably in the form of public investment or subsidies, promotes entrepreneurship but the negative relationship with political stability is unexpected.

4.4.5. Tax burden (TB) model

In the Long Run Equation, TB, UN, INF and PS are all statistically significant. The negative relationship with TB suggests that higher tax burden discourage entrepreneurship, aligning with the conventional belief that lower taxes spur business creation. In Short Run Equation: Not all coefficients are displayed,

but from the provided data, none seem statistically significant. The detrimental effect of high tax burdens on entrepreneurship has been widely acknowledged in the literature.

4.4.6. Property rights (PR) model

In the Long Run Equation, PR, GGDP, UN and INF are all statistically significant. PR's positive relationship suggests that stronger property rights provide important incentives for higher economic performance, aligned with the conventional belief that secure property rights have crucial importance to foster economic growth and development. While in the Short Run Equation, the coefficients, except for D (GGDP) at 0.0720, are not statistically significant. This suggests that the short-run impacts of PR and other variables do not significantly affect the dependent variable, which could imply stronger long-term influence of PR. The importance of secure property rights for long-term economic development has been extensively documented in the literature. This model supports that view showing a statistically significant, positive long-term relationship between property rights and the dependent variable.

4.4.7. Government integrity (GI) model

In the Long Run Equation, GI, GGDP, UN and INF are all statistically significant. The positive relationship with GI suggests that higher government integrity increases the dependent variable, possibly representing economic well-being required to foster or sustainable growth. In the Short Run Equation, none of the coefficients are statistically significant, indicating that the variables might not immediately impact the dependent variable, reinforcing the long-term effect of government integrity. The crucial role of government integrity in long-term economic stability and development is well-acknowledged in academic literature Prasetyo and Kistanti (2020) and Kamarudin et al. (2021). This model backs that assertion, showing a strong, positive long-term relationship between government integrity and the dependent variable.

Generally, economic freedom components demonstrate varied relationships with entrepreneurship in countries of the GCC Region. While some components, like Monetary Freedom and Labor Freedom, show positive relationships, others, like Tax Burden, indicate a potential negative impact.

Inflation, growth in GDP, and unemployment are recurrent significant predictors across models, indicating their crucial role in the entrepreneurial landscape of the GCC. It needs to be highlighted that long-run equations appear to more significant predictors than short-run equations suggesting that the impact of economic freedom on entrepreneurship manifests more prominently over a longer horizon.

The analysis reveals that the components of economic freedom exhibit varied relationships with entrepreneurship. For instance, while monetary freedom and labor freedom show positive relationships, tax burden indicates a potential negative impact. Across models, inflation, GDP growth, and unemployment emerge as significant predictors, emphasizing their critical role in the entrepreneurial landscape of the GCC.

4.5. Comparative analysis

Our research, which examines the connection between entrepreneurship and economic freedom in the GCC, provides new perspectives on the topic that both concur with and depart from previous studies.

The congruence of results with research by Angulo-Guerrero et al. (2017), Sweidan (2022) and Kuckertz et al. (2016) supports the notion that economic freedom is a major driver of entrepreneurship. This agreement in a variety of geographic circumstances highlights how strong the link is between financial independence and entrepreneurial vigor.

Further examination, similar to that conducted in studies by Carlos Díaz-Casero et al. (2012) and Sobel (2015), dissects economic freedom into its constituent parts and demonstrates the distinct effects of each component. For example, whereas factors, such as tax burden, can be considered barriers to entrepreneurship, contrasting with other factors that encourage it.

When the results are observed from a temporal lens, they indicate that the benefits of economic freedom in terms of promoting entrepreneurship become increasingly apparent over time as opposed to

in the short term. This finding is consistent with the focus placed by Ghosh and Hall (2018) on the long-term effects of economic freedom on entrepreneurship.

The importance of economic stability promoting entrepreneurship is also highlighted by our research. In line with the ideas of Dempster and Isaacs (2017) and Saunoris and Sajny (2017), our research suggests that political stability and GDP growth play a significant role determining the entrepreneurial equation.

Some results, though, like the inflation and entrepreneurship, seem counterintuitive. These findings open new avenues for scholarly investigation pressing to reconsider widely held beliefs.

To gain further insights, it would be advantageous to compare our findings with a wider range of studies. Even if broad trends may show up, the subtleties unique to certain areas or sociocultural situations provide insightful viewpoints for researchers and decision-makers.

Breaking down the components of economic freedom further, more dynamics can be revealed to direct more efficient governmental interventions helping policymakers adopt a well-informed and a cautious approach formulating national and regional plans based on solid scientific data.

The convergence of results from fields like property rights, as demonstrated by Redford (2020) and Purwaningsih (2019), highlights the crucial importance of multidisciplinary cooperation in this field. Furthermore, because there is an abundance of data accessible, meta-analyses may be very helpful combining knowledge from several studies to provide a more thorough and comprehensive picture of results.

5. Conclusion and recommendations

This research has analyzed the impact of economic freedom and its components on entrepreneurship in the GCC countries. Economic freedom is a pivotal catalyst, promoting an optimal environment where entrepreneurship can flourish. All the components of economic freedom included in the analysis—namely property rights, government integrity, tax burden, government spending, business freedom, labour freedom, and monetary freedom—plays an integral role in shaping the entrepreneurial ecosystem.

This research enhances the understanding of economic freedom's impact on entrepreneurship in the GCC region. By utilizing Panel ARDL methodology, our analysis offers a detailed examination of individual economic freedom elements and their influence on entrepreneurial activity over an extended period (2006–2020). This approach allows for nuanced insights and specific policy recommendations, providing a fresh perspective and contributing significantly to the existing literature.

The detailed analysis indicated that property rights give individuals confidence and security to invest in new ventures, reflecting direct correlation with proliferation of entrepreneurship. Government integrity enhances the overall business climate mitigating corruption and fostering trust between the government and entrepreneurs, essential to foster entrepreneurial activities. The findings related to the tax burden and government spending highlight that a balanced and reasonable approach in these areas can foster a supportive environment for entrepreneurship, enabling individuals to invest resources in innovative endeavours and start-ups.

Business freedom, labour freedom and monetary freedom were found crucial providing flexibility and autonomy entrepreneurs require. They create a framework where individuals can operate their businesses with minimal constraints, explore new market opportunities, and adapt to changing economic landscapes, ultimately contributing to the sprouting, and flourishing of new business ventures compounding entrepreneurial ecosystems in the GCC region.

Given the intricate interplay of the components of economic freedom and their substantial impact on entrepreneurship, as revealed by our analysis, we strongly recommend that GCC countries prioritize enhancing each aspect of economic freedom. Strengthening property rights, fostering government integrity, optimizing tax structures, rationalizing government spending, and promoting business, labour and monetary freedom should be at the forefront of policy agendas.

Paying special attention and strengthening these components of economic freedom, GCC countries can cultivate a more favourable and nurturing environment for entrepreneurship, which is indispensable for economic diversification, innovation, and sustained growth and social development. Policymakers

must engage in continual dialogue with entrepreneurs and the business community to formulate and refine policies aligned with the entrepreneurial ecosystem's evolving needs, thereby eliminating barriers and creating a robust foundation for entrepreneurial success.

One of the research's limitations is that the data included in the analysis came from the GCC region between 2006 and 2020. It's crucial to remember that these conclusions are context-specific and might not apply to areas with different political, cultural, or economic backgrounds. Furthermore, the results reached may not apply to other regions with distinct political, cultural, or economic circumstances because they are peculiar to the GCC region.

There is a plethora of opportunities for further research in this field in the future. Including data from after 2020 in the research would give it a more up-to-date perspective and might even highlight new developments in the way that entrepreneurship and financial independence are related. Comparative research with other GCC regions would provide important depth.

Authors' Contributions

Conception and design, Omer Ahmed Sayed and Selma Abdelrahim, analysis and interpretation of the data, Omer Ahmed Sayed.; the drafting of the paper, Omer Ahmed Sayed and Selma Abdelrahim.; revising it critically for intellectual content, Omer Ahmed Sayed. The final approval of the version to be published Omer Ahmed Sayed and Selma Abdelrahim. All authors have read and agreed to be accountable for all aspects of the work.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The dataset supporting the findings of this research is available for public access and research replication. Data, collected from 2006 to 2020, is deposited in a dedicated online repository, accessible at [<https://databank.worldbank.org/>, <https://www.gemconsortium.org/> <https://www.heritage.org/index/>]. For additional information or inquiries regarding data access, please contact the corresponding author.

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