NEXUS BETWEEN FINANCIAL INTERMEDIATION, ENTREPRENEURSHIP AND ECONOMIC GROWTH

By

Zahid Mehmood Akhtar

NATIONAL UNIVERSITY OF MODERN LANGUAGES ISLAMABAD

August 2025

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

In **MANAGEMENT SCIENCES**

To

DEPARTMENT OF MANAGEMENT SCIENCES

(PhD Management Sciences)

NATIONAL UNIVERSITY OF MODERN LANGUAGES, ISLAMABAD

August 2025

THESIS/DISSERTATION AND DEFENSE APPROVAL FORM

The undersigned certify that they have read the thesis, examined the defense, are satisfied with the overall exam performance, and recommend the thesis to the Faculty of Management Sciences for acceptance:

Thesis/Dissertation Title: Nexus between Financial Intermediation, Entrepreneurship and Economic Growth

Submitted By: **Zahid Mehmood Akhtar** Registration No. **831-PhD/MS/S-19**
Name of Student

Doctor of Philosophy
Degree Name

Management Sciences
Discipline

Dr. Faid Gul _____
Supervisor *Signature*

Dr. Ejaz Mustafa Hashmi _____
HoD MS *Signature*

Prof. Dr. Muhammad Zahid Iqbal _____
Dean (FMS) *Signature*

Maj Gen (R) Shahid Mahmood Kayani, HI (M) _____
Rector NUML *Signature*

_____
Date

DECLARATION FORM

I _____**Zahid Mehmood Akhtar**_____

Son of _____**Saleh Muhammad**_____

Registration # _____**831-PhD/MS/S-19**_____

Discipline: _____**Management Sciences**_____

Candidate of Doctor of Philosophy at the National University of Modern Languages do hereby declare that the dissertation **Nexus between Financial Intermediation, Entrepreneurship and Economic Growth** submitted by me in partial fulfillment of PhD degree, is my original work, and has not been submitted or published earlier. I also solemnly declare that it shall not, in future, be submitted by me for obtaining any other degree from this or any other university or institution.

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Zahid Mehmood Akhtar
Name of Candidate

DEDICATION

I dedicate this dissertation to my friends, teachers, and colleagues who share a belief in the profound value of learning. A gratitude to my parents for continuous encouragement and their insistence on resilience resonate with me. A special acknowledgment for my life partner, whose continuous support, motivation, and encouragement has been a driving force throughout this journey.

ACKNOWLEDGEMENTS

I would like to begin by expressing my heartfelt gratitude to the Almighty Allah for bestowing upon me the passion, strength, and commitment required to successfully complete this thesis. Without the guidance of my esteemed teachers, the help of friends, and the unwavering support of my family, this achievement would not have been possible.

I extend my deepest thanks to my supervisor, Prof. Dr. Faid Gul, and my co-supervisor, Dr. Fauzia Mubarik, for their invaluable guidance and for providing an excellent research environment. Special appreciation goes to my friends, Mr. Muhammad Sohail, and Dr. Shafqut Ullah for their kind guidance and support throughout this study.

Expressing gratitude to my parents, family, colleagues, and friends seems insufficient, as their encouragement and support played a pivotal role in every stage of my research. Lastly, I cannot overlook the crucial support and unwavering faith of my better half; without her, this research work would not have been possible.

ABSTRACT

Thesis Title: Nexus between Financial Intermediation, Entrepreneurship and Economic Growth

This study examines the relationship between financial intermediation, entrepreneurship, and economic growth across countries driven by innovation, efficiency and resources, as well as in Pakistan, with a particular focus to assess which type of economy benefits the most from entrepreneurship in this relationship. While financial intermediation is recognized as a key driver of economic growth and entrepreneurship, the interconnectedness between these domains remains underexplored. Using data of eighty four countries from 1996 to 2020 extracted from World Development Indicators, World Governance Indicators and International Labor Organization, the study applies pooled OLS, Fixed Effect, Random Effect, and Generalized Method of Moments models to analyze the direct effects of financial intermediation on economic growth and entrepreneurship globally, and within specific economic settings. Structural equation modeling (SEM) is employed to examine the mediating role of entrepreneurship. For the Pakistan-specific analysis, the Auto-Regressive Distributed Lag model is used for both long-term and short-term effects, alongside SEM to validate the mediating role. Key findings indicate that financial intermediation positively influences both economic growth and entrepreneurship across all types of economies, including Pakistan. Entrepreneurship significantly mediates the relationship between financial intermediation and economic growth globally, however with varying impacts across different economic contexts. In innovation-driven and efficiency-driven economies, entrepreneurship plays a significant mediating role, while in resource-driven economies; entrepreneurship does not play any mediating role and remains largely necessity-driven, with weaker financial systems and governance structures limiting its potential. While efficiency-driven economies see a higher mediation effect, suggesting that these economies benefit the most from entrepreneurial activity in the finance-growth nexus. In the case of Pakistan, the study finds that entrepreneurship significantly mediates the effect of financial intermediation on economic growth, highlighting the need for robust financial intermediation, government effectiveness, and rule of law. The findings suggest that in innovation-driven economies, policies fostering venture capital ecosystems are critical, while in resource-driven economies, financial inclusion programs and microfinance initiatives should be prioritized to improve entrepreneurial ecosystems, and address unemployment through entrepreneurship aiming to foster sustainable economic growth.

Key Words: Financial Intermediation, Entrepreneurship, Economic Growth, Mediation, SEM

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CHAPTER – 1

INTRODUCTION

1.1. Background of the Study

Economic growth, often perceived as a straightforward expansion of a nation's economy, encompasses a complex and multifaceted phenomenon that has intrigued researchers for centuries. It represents the sustained enhancement in output of a country in terms of services and goods over time, reflecting progress, development, and prosperity. However, its significance extends far beyond mere statistical metrics, shaping societies, influencing policies, and affecting the lives of individuals worldwide.

1.1.1. The Importance and Significance of Economic Growth

Economic growth serves as a fundamental indicator of a nation's development and well-being, underpinning the aspirations of societies for improved living standards, enhanced opportunities, and overall progress. As Nobel laureate Simon Kuznets aptly noted, economic growth is not everything, but in the long run, it is almost everything. It creates jobs, increases income, reduces poverty, improves access to essential services like healthcare and education, provides the means for individuals to achieve economic security and fulfill their aspirations (Kuznets, 1971). Economic growth facilitates the creation of new technologies, enabling nations to enhance infrastructure, healthcare, education, and social services, thereby establishing a solid foundation for human capital development and societal progress. Additionally, economic growth drives innovation and technological advancement, enhancing international competitiveness, boosting productivity, and propelling economies toward higher levels of prosperity (Audretsch & Thurik, 2001; Ang, 2008).

Experts in economics, regardless of their theoretical backgrounds, provide in-depth analyses and explanations of the factors that drive and influence economic growth. Keynesian economics, as espoused by Keynes (1936), emphasizes the intervention of

government and its role in stabilizing economies and sustaining growth through the optimum combination of policies. By stimulating aggregate demand during economic downturns, Keynesians seek to mitigate cyclical fluctuations and spur economic activity (Pigou, 1936). Conversely, monetarist economists like Milton Friedman advocate for minimal government intervention and prioritize maintaining a stable money supply to achieve long-term growth (Friedman, 1970). Neo-classical economists such as Robert Lucas emphasize the importance of supply-side factors, including human capital development, technological innovation, and institutional reforms, in driving sustained economic growth (Lucas, 2002).

1.1.2. Diverse Growth Experiences across Economic Classification

The path to economic development is influenced by several factors such as history, institutions, financing, politics, business cultures, and the availability of resources (Barro, 1997; Acs et al., 2008). Countries have attempted to achieve economic growth and development at different times and in different ways, each governed by its own contextual realities and historical development pathways. In examining these pathways, the Global Competitiveness Framework classifies economies into three broad resource categories hierarchically based on their primary growth drivers: resource driven, efficiency driven, and innovation driven. Economies that are resource driven are considered the least developed due to heavy reliance on subsistence agriculture, natural resource extraction, and low skilled labor. These economies focus on fundamental activities and industries within the primary sector such as extracting natural resources and subsistence agriculture. Economies driven by efficiency have progressed beyond the initial stage and have become more competitive as a result of enhancements in manufacturing processes and product quality. In these economies, the focus shifts towards the manufacturing and industrial sectors, where economic growth relies heavily on efficiency and scale. Economies powered by innovation are the most highly developed and advanced. During this phase, companies prioritize efforts focused on innovation and the acquisition of knowledge. The service industry experiences substantial growth, with a strong dependence on skilled labor and expertise. These economies allocate significant resources to research and development (R&D) and prioritize technological progress and industries with high economic value.

South Korea, Taiwan, Hong Kong, and Singapore exemplify innovation-driven economies that have undergone remarkable transformations. These countries emphasized export-led industrialization, foreign investment attraction, and the development of human capital through education and skill enhancement. Their strategic focus on innovation and industrial upgrading led to exponential industrialization, productivity growth, and a significant rise in living standards (Ranis, 1995). China, has achieved the innovation-driven status by following a unique hybrid path that combines state-led planning with market reforms. Since the late 1970s, large-scale infrastructure investments, an abundant labor force, and an export-oriented manufacturing base have fueled China's rapid ascent as an economic powerhouse (Naughton, 2007). India, also transitioning to an efficiency-driven economy, demonstrates strong growth potential through its youthful population, expanding middle class, and a dynamic technology sector. Its digital infrastructure advancements and growing entrepreneurial activity signal a shift toward innovation-driven development (Bergenwall, 2016).

In contrast, many countries in sub-Saharan Africa remain resource-driven economies, where growth largely depends on the export of raw materials. Political instability, weak institutions, and insufficient infrastructure have impeded progress toward economic diversification and structural transformation. These barriers continue to limit investment and reliance on commodities, which further exposes these countries to shocks from outside forces. Regardless of the obstacles, some resource-dependent countries like Rwanda have showcased how deliberate policy changes along with investment in human resource development can lay the groundwork for sustained development (Collier, 2007). The economic story of Pakistan is also multi-faceted, as it tends to shift between resource and efficiency driven. The country witnessed early industrial growth in the 1960s, fueled by manufacturing and infrastructural advancements (Hasan et al., 1997). However, in the 1970s political turmoil, rampant nationalization, and the oil crisis stalled economic progress. The following decades faced the burden of structural adjustment, and in collaboration with international financier entities the economy underwent liberalization in an attempt to stabilize it and promote market oriented policy changes (Isran, 2016). Even with these reforms, low human capital development, political instability, inadequate infrastructure, and a number of other factors still obstruct Pakistan's shift to an efficiency or innovation driven economy (Husain, 2018). More recently, infrastructure spending and

increased regional integration have been served as the stimulus for growth under the China-Pakistan Economic Corridor (CPEC) initiative, although chronic fiscal deficit and external debt challenges remain (Wolf, 2020). Pakistan's ongoing struggle with inflation, currency depreciation, and a balance of payments crisis further illustrates the structural weaknesses limiting sustained economic growth (World Bank, 2023).

Countries with rich endowments in oil, minerals, or arable land are often perceived as having a natural advantage in development and the role of natural resources in shaping economic outcomes remains significant in development narratives. However, reliance on natural resource exports can create vulnerabilities. The "resource curse" describes how resource wealth may lead to economic stagnation, rent-seeking, Dutch disease effects, governance issues, and a failure to diversify the economy (Sachs & Warner, 1997). Numerous countries rich in natural resources have failed to translate this wealth into inclusive and sustainable development.

Conversely, the economic rise of countries with limited natural resources highlights the critical role of policy, innovation, and human capital. Japan achieved rapid growth and post-war recovery by strategically investing in education, infrastructure, and technology, which enabled the development of its industrial base globally (Amsden, 1991). The expansion of the South Korean economy and its drastic shift from an agrarian economy to an industrial and technological powerhouse highlights the impact of policy formulation and effective educational frameworks along with innovation (Amsden, 1989; Collins, 1990). Likewise, Singapore's emergence as a high income economy with scarce resources reflected its investment in human capital and the creation of an environment conducive to innovation (Lim, 2015; Birger et al., 2008; Wong, 2005; Tan et al., 2024).

These experiences showcase the challenges countries face in achieving economic growth. While all countries strive for growth, they differ in economic endowments, institutional capacities, and strategies for development. However, evidence shows that nearly all countries share two characteristics crucial to economic growth: financial development and entrepreneurship. Efficient financial systems enhance resource allocation, stimulate investments in the private sector, and manage risks. Entrepreneurship brings new ideas, creates jobs, and improves competitiveness. Both financial systems and entrepreneurship are increasingly viewed as key engines for economic growth. Every single nation is trying

to improve its financial and entrepreneurial frameworks in hopes of achieving sustainable and inclusive development. This prompts the focus of this study, which is to analyze the relationships between financial intermediation, entrepreneurship, and economic growth from the perspective of resource-driven, efficiency-driven, and innovation-driven economies.

1.1.3. Economic Dynamics and the Financial System

The financial sector's influence on the economy and its development has been studied with profound depth. Scholars attempting to identify the relationship between the economy and finance have sought to describe the means of finance's impact on the economy. Financial development (Levine, 2005); financial inclusion (Demirgüç-Kunt & Klapper, 2012); financial liberalization (Claessens & van Horen, 2015); and financial intermediation (Allen & Santomero, 2001) are all examples of perspectives in finance that possess their own distinct individuality. All these interrelate and influence the efficiency and operational parameters of the financial system which, in turn, determines the economic growth.

Recognizing the financial sector as an accelerator of economic development through savings mobilization, resource allocation and stimulation of investments illustrates its significance. Various theories like that of financial intermediation (Allen & Santomero, 1997) and the finance-growth nexus hypothesis (Marwa & Zhanje, 2015) developed provided additional frameworks to capture the interconnections among the economy, financial sector development, and economic growth. Empirical studies have found that there is a positive relationship between economic growth and financial sector development (Bencivenga & Smith, 1991; Saint-Paul, 1992; King & Levine, 1993). Many case studies, cross-country comparisons and time series analyses have been conducted to examine the relationship between economic growth and financial sector development. Aside from showing the efficiency of financial systems and the influence they exert on economic activities, the measures of financial sector development also include depth, breadth, efficiency, stability, and other comparable calibrated metrics. Additionally, the researchers studied the intermediation, innovation, liberalization, and inclusion of finance as channels through which the financial system affects economic growth. These

relationships are multidimensional, illustrating the need to pay attention to the institutional, structural, and policy levels in the understanding of the dynamics of the financial sector, its development, and its impact on other sectors of the economy

1.1.4. Importance of Finance in Entrepreneurship

Finance drives different business activities and also determines the level of entrepreneurship, thus discussing the impact of finance is vital for all phases of entrepreneurship in the literature. Throughout the life of an enterprise, finance plays an important part during the start-up, expansion, and long-term sustainability phases. Acquiring sustainable finances requires more than just a favorable capital balance; it means gathering and allocating scarce resources strategically, obtaining funding during the various developmental milestones, influence of financial choices made on business performance, to manage risks and take advantage of opportunities, entrepreneurs require sound financial management (Ajide, 2020).

Financial intermediation facilitates risk management and the flow of vital information and capital which aids entrepreneurs in starting and growing their businesses. Further, these functions help sustain entrepreneurial activities, promoting economic development, innovation, and diversification. Banks, venture capital firms, and angel investors serve as financial intermediaries, providing required funding to entrepreneurial ventures, especially where there is a challenge accessing capital markets. To assist new businesses manage their initial and ongoing spending, banks supply several financial instruments including loans, credit lines and overdrafts. With regards to external financing, banks are central to the finance of small and medium enterprises (SMEs), many of which depend heavily on bank financing (Beck & Demirguc-Kunt, 2008). Unlike bank financing, venture capital firms support their clients with not only funding, but also with strategic advice, mentorship, and relevant networks, increasing the likelihood of entrepreneurship success (Gompers and Lerner, 2001). Early stage companies are the main focus for angel investors who also provide business mentorship besides finances (Kerr et al., 2014).

Financial intermediaries assist in managing and mitigating risks that come with entrepreneurial activities. They can reduce individual risk exposure by diversifying investment portfolios through pooling resources from many investors. Banks and other

financial institutions spend considerable resources using complex risk evaluation models to assess the creditworthiness of entrepreneurial undertakings to ensure optimal fund allocation (Diamond, 1984; Bruns & Fletcher, 2008). Additionally, financial intermediaries provide coverage in the form of multiple insurance plans that shield businesses from unforeseen risks i.e. damage of property, liabilities, and even business disruptions etc. (Greenbaum et al., 2019). On the other hand they also reduce information asymmetry between entrepreneurs and investors. They conduct due diligence, monitor the performance of funded ventures, and provide valuable insights and oversight. Venture capitalists and banks perform thorough due diligence to evaluate the potential of business ideas and the credibility of entrepreneurs (Sahlman, 2022). Continuous monitoring by financial intermediaries ensures that the entrepreneurs use the funds appropriately and that the business stays on track to meet its goals (Gompers & Lerner, 1996). It is argued that financial intermediaries don't just provide funding; they also keep a close eye on how entrepreneurs use the money. This monitoring helps guarantee that entrepreneurs are wisely spending the money to succeed and business is on the right track, performing as planned and meeting its financial targets. These institutions also make it easier for entrepreneurs to access the necessary resources, offer payment processing and other financial services that streamline day-to-day business transactions (Gorton & Winton, 2003).

Countries with well-developed financial systems have higher levels of entrepreneurial activity and economic growth (King and Levine, 1993).Academic research consistently highlights the positive role of financial intermediaries in fostering a supportive environment for entrepreneurs that contributes to job creation, economic development, and technological advancements. This strengthens the entrepreneurial ecosystem which in turns drives innovation and economic growth.

1.1.5. Entrepreneurship and Economic Growth

Entrepreneurs participate significantly in accelerating economic progress by starting new businesses. This contributes to an economic shift that increases overall economic activity. As a result, there is an increase in the supply of goods and services produced, a higher volume of economic transactions, and ultimately a greater enhancement of economic

development. The expanded economy leads to increased employment options, enhanced income, and investment in key infrastructure like transportation and communication systems. Overall, this improves the economic health of the nation, which enhances the standard of living for citizens.

The role of entrepreneurs in growth was first fundamentally articulated by Joseph Schumpeter. In his inspiring work, Schumpeter (1934) emphasized the role of the entrepreneur as an innovator who drives economic development through a process he termed ‘creative destruction’. While emphasizing the contribution of entrepreneurs and innovation in bringing economic prosperity, he argued that new ideas and technologies, embodied in what he termed "creative destruction," were the engine of growth. This concept describes how entrepreneurs disrupt existing markets and industries by introducing groundbreaking innovations that render old products and processes obsolete. Through this continuous cycle of innovation and obsolescence, entrepreneurs not only spur economic growth but also ensure that economies remain dynamic and competitive. These innovative activities are necessary for growth of the economy, as they drive the structural transformation necessary for economies to evolve and prosper.

Entrepreneurs create more job opportunities by initiating and establishing new businesses. This need for job creation is of utmost importance in order to tackle unemployment and elevate household incomes, thereby driving more economic growth (Acs and Audretsch, 2003). This aspect is especially crucial in emerging economies, as job prospects are typically scarce in these regions. Moreover, Entrepreneurs identify and exploit new opportunities, invest in research and development, and bring innovations to market, leading to efficiency gains, quality improvements, and new business models. These initiatives lead to improvements in productivity and economic growth by reducing the cost of doing business, as they increase productivity and streamline resource utilization (Baumol, 2002).

Entrepreneurs as new entrants beings healthy competition in the marketplace which may increase the market's operational efficiency and lower the prices for consumers. This new competition could inspire older companies to improve their operations as well. Therefore, this new competitive pressure from entrepreneurial firms compels established businesses to become more innovative, improving overall market productivity (Porter, 1990).

Entrepreneurship leads to optimum utilization of resources, as the new entrants identify and exploit new opportunities. The transfer of resources from less productive areas to the productive one enhances productivity and economic growth (Kirzner, 1997). The success of entrepreneurial ventures results into wealth creation that can be reinvested into the economy. Redistributing the wealth generated in this way helps distribute economic rewards in a more equitable manner between different groups of people, and could improve social along with economic equality. Thus, countries that foster entrepreneurship tend to grow at a faster pace owing to competitive edge, increased employment opportunities, and wealth creation, which positions entrepreneurs as critical drivers for ongoing economic evolution and development.

1.2. Motivation of the Study

The interconnection between finance and growth integrates the impact of the financial system on fostering economic growth (Beck et al., 2000; Levine, 2005). Financial intermediation improves the allocation of resources and investment as well as innovation, which are crucial for economic growth. Also, there is support for the argument that finance enables entrepreneurship by providing the desired capital, as well as the financial systems that support the creation and growth of enterprises (Rajan & Zingales, 1998; Klapper et al., 2006). At the same time, entrepreneurship itself is increasingly viewed as an important factor of economic growth, contributing to job creation, productivity enhancement, and innovation across all types of economies, whether underdeveloped, developing, or developed (Wennekers & Thurik, 1999; Acs et al, 2008). Despite these widely accepted linkages, an important question remains underexplored: are countries more successful in achieving sustainable economic growth when they develop their financial systems with a clear emphasis on supporting business activity, especially entrepreneurship?

Evidence suggests that not all countries that have expanded their financial systems have experienced corresponding economic growth (Demirgüç-Kunt & Levine, 2008). This divergence suggests that while financial development is necessary, it may not be sufficient to stimulate economic growth unless it is effectively channeled through

productive activities. This leads to the hypothesis that a transmission mechanism is needed to convert financial development into desirable economic outcomes and entrepreneurship can potentially serve as an intermediary. It is within this context that this study finds its motivation to examine whether entrepreneurship functions as a mediating channel through which financial intermediation influences economic growth. The interplay among financial intermediation, entrepreneurship, and economic growth requires a more systematic exploration to understand the dynamics of their interaction.

Furthermore, the study aims to investigate whether countries that have deliberately fostered entrepreneurship as part of their financial and economic policy frameworks have achieved more favorable developmental outcomes compared to those that have not. The novelty of this research lies in its effort to assess this relationship across different stages of economic development. By examining innovation-driven, efficiency-driven, and resource-driven economies, the study seeks to identify that in which countries entrepreneurship mediates most effectively between financial intermediation and economic growth. It also explores whether countries that have leveraged entrepreneurship in this way have indeed realized the desired economic outcomes. In doing so, the study addresses an existing research gap: while the individual roles of financial development and entrepreneurship in promoting growth have been studied, the mediating role of entrepreneurship between financial intermediation and economic growth, particularly across different economic contexts, has not been adequately theorized or empirically tested. By focusing on this interactive relationship, the study contributes another perspective that emphasizes the importance of policies in promoting entrepreneurship as a transmission mechanism within financial development strategies.

This research aspires to generate insights for the economies that have yet to realize the full benefits of the interaction between financial intermediation, entrepreneurship and economic growth. By learning from countries where entrepreneurship has effectively mediated the relationship between finance and growth, others can adopt the similar strategies to enhance their entrepreneurial ecosystems and improve their economic performance. The working hypothesis, therefore, posits that financial intermediation positively influences economic growth primarily through its impact on entrepreneurship, and that the strength of this mediating effect varies across countries depending on their stages of development.

1.3. Problem Statement

The relationship between financial intermediation and economic growth has received a lot of attention from academics, politicians, and financial professionals, especially after the global financial crisis in 2007-2009. The crisis had a considerable impact on global output, employment, and total economic activity, raising doubts about whether the economic performance can be attributed solely to effective financial intermediation (Alpha et al., 2016).

Although extensive research supports a positive association between financial intermediation and economic growth (Maune et al., 2020; Rahman et al, 2020), many countries, including Pakistan, have experienced stagnant growth and persistent unemployment despite financial sector development. This disparity suggests that financial intermediation alone may not be sufficient to drive economic expansion. Periods of slow growth often lead to increased unemployment and business uncertainty, prompting individuals to pursue entrepreneurship as an alternative to formal employment (Santos et al., 2022). Empirical research highlights the role of entrepreneurship in driving economic performance by fostering innovation and restructuring production activities (Spigel & Stam, 2018; Kim et al., 2022; Van Rijnsoever, 2022). Similarly, governments view entrepreneurship as a viable option to combat unemployment and, as a result, implement policies, offer incentives, and provide financial support to strengthen entrepreneurial ecosystems and address the economic challenges.

Despite these efforts, the projected improvements in economic outcomes have not always materialized and desired level of entrepreneurship is not achieved. This suggests a potential gap in the transmission mechanism between financial intermediation and economic growth. While previous literature emphasizes the importance of financial intermediation and entrepreneurship to economic development, little emphasis has been given to their interrelationships. In particular, the potential role of entrepreneurship as a mediating factor in the finance-growth relationship remains underexplored.

To address this gap, the present study investigates whether financial intermediation influences economic growth through the channel of entrepreneurship. Using cross-country panel data classified by the Global Entrepreneurship Monitor (GEM) into

resource-driven, efficiency-driven, and innovation-driven economies, the study provides a comparative perspective across diverse economic contexts. Additionally, a focused analysis on Pakistan assesses the mediation effect within a national framework. By exploring these dynamics, the study seeks to identify in which type of economy, financial intermediation has the most significant impact on economic growth through entrepreneurial activities. The findings aim to guide the development of more targeted and effective financial and entrepreneurial policies, aligned with the needs of different economic contexts.

1.4. Research Questions

(i) In what ways does entrepreneurship mediate the impact of financial intermediation on economic growth at a global level?

(ii) To what extent does entrepreneurship mediate the effect of financial intermediation on economic growth in innovation-driven economies?

(iii) In which ways does entrepreneurship mediate the relationship between financial intermediation and economic growth in efficiency-driven economies?

(iv) To what degree does entrepreneurship mediate the association between financial intermediation and economic growth in resource-driven economies?

(v) In the context of Pakistan, to what extent does entrepreneurship mediate the impact of financial intermediation on economic growth?

1.5. Research Objectives

To analyze the mediating role of entrepreneurship between economic growth and financial intermediation is the general objective of this study. To achieve this, the research focuses on the following specific objectives within a theoretical framework:

(i) To analyze how entrepreneurship mediates the impact of financial intermediation on economic growth at a global level.

(ii) To examine the mediating role of entrepreneurship in the relationship between financial intermediation and economic growth in innovation-driven economies.

(iii) To assess how entrepreneurship mediates the relationship between financial intermediation and economic growth in efficiency-driven economies.

(iv) To evaluate the mediating role of entrepreneurship in the association between financial intermediation and economic growth in resource-driven economies.

(v) To investigate how entrepreneurship mediates the impact of financial intermediation on economic growth in the context of Pakistan.

1.6. Significance

Exploring the mediating role of entrepreneurship in the relationship between financial intermediation and economic growth is a contribution of this study in the existing literature. By integrating these three domains i.e. financial intermediation, entrepreneurship, and economic growth, this research contributes to a more comprehensive conceptualization of the dynamics that drive economic expansion. This integration has been largely overlooked in previous studies, making this research a novel contribution to the field of economics and finance. Policymakers will be able to get actionable insights from the findings of this research. By identifying which type of economy i.e. resource-driven, efficiency-driven, or innovation-driven, benefits most from financial intermediation through the channel of entrepreneurship, the study guides the design and implementation of targeted financial and entrepreneurial policies. These insights help in formulating strategies that optimize the influence of financial intermediation on growth of the economy, based on the particular requirements and specific conditions of different countries.

The focused analysis on Pakistan offers crucial insights into the country's economic dynamics. Understanding whether entrepreneurship mediates the link between economic growth and financial intermediation in Pakistan is helpful for policymakers and stakeholders in the financial and entrepreneurial sectors to design more effective interventions. This is crucial for countries such as Pakistan which strives to attain and maintain a progressive economy alongside improved financial inclusion.

From the perspective of financial institutions, the findings indicate the need to provide adequate financial services and products tailored to the entrepreneur's needs. Realizing

the role of financial intermediation in fostering and bolstering entrepreneurship and, in turn, economic growth, enables these financial institutions to assist the entrepreneurial ecosystem to enhance their own growth and sustainable development.

The analysis brings a cross-country perspective of the financial system and entrepreneurship, along with their relationship with economic growth. It serves as a useful guide for many organizations working towards international development, financial institutions, and even governments who want to understand the impact of financial policies at different levels of economic development.

This study makes important contributions to develop policies and strategies that need to be adopted in a certain environment to improve the economy in relation to other contexts. It also lays the groundwork for other researchers interested in the relationship between entrepreneurship, economic growth, and financial intermediation by providing a methodology to follow. To advance the discipline, other researchers could use this approach to study other regions with the same issues or apply other models and methods.

1.7. Organization of the Research

The chapter wise breakdown of the remaining thesis is as under:

Chapter-2 lays down the review of literature regarding impact of financial intermediation on economic growth, effect of financial intermediation on entrepreneurship, and influence of entrepreneurship on economic growth.

In Chapter-3, the theoretical connections and conceptual underpinning between economic growth, financial intermediation, and entrepreneurship are discussed. This chapter also provides details regarding data, empirical models, and econometric procedures used in the thesis.

Chapter-4, presents the Panel analysis. The empirical results, discussion and interpretation is provided regarding direct impact of financial intermediation on both the economic growth and entrepreneurship and its indirect impact through the channel of entrepreneurship globally, as well as in innovation, efficiency, and resource-driven economies.

The focus of Chapter-5 is the empirical results and their discussion regarding direct impact of financial intermediation on economic growth and entrepreneurship as well as its indirect impact through the channel of entrepreneurship specifically in Pakistan.

Chapter-6 concludes the dissertation by summarizing the key findings and offering policy implications based on the research outcomes.

CHAPTER – 2

LITERATURE REVIEW

2.1. Introduction

This chapter briefly analyses the empirical as well as theoretical literature on the interrelationship between financial intermediation, entrepreneurship and economic growth. The association between economic growth and financial intermediation is explained in the first section, the second explains the link between entrepreneurship and financial intermediation, while the third explains the connection between economic growth and entrepreneurship. These sections also explain the contextual factors, institutional impacts and policy effects of governments that influence these relationships. Empirical and theoretical researches have been elaborated in each section that have given important perspectives regarding how economic growth is impacted by financial intermediation, how it influences entrepreneurial activities, and how entrepreneurship drives economic growth. However, the current literature largely examines these relationships in isolation, with limited exploration of the interconnections between all three domains empirically and there exists a research gap. This research attempts to fill this gap.

2.2. Nexus between Financial Intermediation and Economic Growth

The connection between economic growth and financial intermediation has been a critical area of study in the field of finance and economics. This literature review aims to explore the empirical as well as theoretical evidence regarding link between economic growth and financial intermediation, highlighting key debates and findings in the academic literature.

The theoretical foundation of the association concerning economic growth and financial intermediation originates from the work of Schumpeter (1912), who posited that financial institutions by mobilization of savings help in fostering innovation and growth in the economy by allocating resources to lucrative investments. Goldsmith (1969) emphasized

that development of financial sector is critical in growth of the economy, suggesting that a financial sector which is more developed leads to higher growth in the economy by improving capital allocation. Robinson (1979) offered an alternative perspective, arguing that growth of the economy itself drives development of financial sector. This opinion proposes that as economies grow, their financial sectors naturally expand to meet the increased demand for financial services. Financial intermediaries reduce transaction costs, mitigate information asymmetries, and diversify risk, which are essential functions to allocate resources proficiently in an economy (Levine, 1997).

The theoretical models, such as those by King and Levine (1993a, 1993b), have formalized the association between growth of the economy and financial development by integrating endogenous growth models with the financial intermediation. These models also suggest the beneficial contribution of financial intermediaries in growth of the economy by improving the funds allocation, encouraging savings and nurturing technological innovation.

The theoretical predictions are generally supported by the empirical studies on growth-finance nexus. King and Levine (1993a) found that higher levels of development in financial sector, as assessed by different indicators such as size of financial sector compared to GDP and private sector credit, correlate with fast expansion in the economy. Levine et al. (2000) expanded on this analysis by using more sophisticated econometric techniques and confirmed the favorable influence of financial intermediation on growth of the economy. Their work underscored the significance of financial intermediaries in reducing poverty and decreasing income inequality, thus suggesting that financial intermediation also enhances economic welfare along with stimulating growth in the economy.

In addition to cross-country studies, the evidence of financial intermediation's favorable influence on economic growth has also been provided by time-series analyses. For instance, Beck et al. (2000) found that a significant driver of long-term growth in individual countries is the development of financial sector. The findings indicated that the countries which possess more sophisticated and developed financial systems tend to experience faster economic growth relative to other countries.

Recent theoretical perspectives have built upon existing models to analyze the financial intermediation's impact on economic growth. Financial intermediaries facilitate the optimum fund allocation by easing transaction costs, managing risks, and solving issues with asymmetric information. As such, these intermediaries have a positive impact on economic growth (Levine, 2012). Often, these models include elements of endogenous growth theory where financial development increases innovation and productivity thereby fueling perpetual economic growth (Aghion et al, 2005; Greenwood et al., 2013). Also, including financial intermediation in the economy has been recognized for its role in accelerating growth, recently placing emphasis on financial inclusion (Demirguc-Kunt & Singer, 2017). Financial inclusion broadens the scope of participants in the economy by making access to useful and affordable financial services available to individuals and enterprises. It adds to the available resources of capital and enhances the diversification of the economy.

There is ample evidence that financial intermediation drives growth and this relationship varies in strength and nature depending on the context. Sahay et al (2015) showed that financial development positively impacts economic growth, particularly in developing and emerging economies. The economy's growth is enhanced by well-functioning financial systems that improve investment and the allocation of resources, as suggested by the findings. Further evidence was provided by Beck et al. (2010), showing that the financial development, especially the level and scope of financial markets, is almost always associated with the economic growth. Furthermore, their findings also stressed the importance of the regulatory systems that ensure the financial stability. Some studies have looked into how the innovations in finance have accelerated growth. For example, Gambacorta et al. (2014) studied the impact of mobile banking and fintech on growth as part of the technology innovations in financial services. In developing countries where traditional banking infrastructure is lacking, these innovations greatly enhance financial intermediation efficiency and, thus, growth.

The relationship between economic growth and financial intermediation is still fairly controversial. However, the classic and modern economic theories, which explain the impact of financial intermediation on the economy's growth, have their origins in historical economic literature. Shaw (1973) claimed that financial repression, as a result of government restriction on interest rates and the credit-supply allocation conduit,

stagnates economic growth. Conversely, Shaw argued that financial liberalization boosts the effectiveness of financial intermediation and promotes growth. Lucas (1988) provided an early critique of the assumption that economic development relies heavily on financial intermediation, arguing that its contribution is likely much smaller than believed. Some studies demonstrate the possibility of non-linear or contextual non-linear financial development's influence on economic growth. The positive impact of financial sector development on economic growth is weaker at higher levels of financial sector development (De Gregorio & Guidotti, 1995). This suggests that the impact of financial intermediation is in low-income economies as compared to high-income countries where the financial systems are already developed. Other studies cast doubt on the ability of financial intermediation to sustain its advantages for economic growth due to the risk of financial crises. For instance, Kaminsky and Reinhart (1999) show that rapidly liberalized markets are prone to rupture in crises, which can devastate economic growth. This motivates some experts to warn that even though financial intermediation is vital for achieving growth, it has to be properly controlled to prevent any financial instability from happening. To claim that the rapid increase of a financial sector poses possible dangers, Cecchetti and Kharroubi (2012) focused on the more recently published papers. They mentioned that if there is too much acceleration in the growth of the financial sector, it risks overheating the inefficiencies in economy's resource allocation, draining a nation's resources and stunting the economy's growth. This implies a multifaceted understanding of financial intermediation, its advantages and detriments need to be balanced (McKinnon, 2010). Additionally, Arcand et al. (2015) noted that the excessive expansion of the financial sector could have negative consequences for growth, thus suggesting the relationship between economic growth and financial development is non-linear. Their analysis indicates that, for all intents and purposes, financial intermediation is helpful, but after a certain threshold, begins to lead to instability and reduce growth.

However, numerous scholars have contest this position by highlighting the useful and constructive role finance has on the advancement of the economy. Aghion et al. (2005) claimed that for developing countries, the financial sector emerges as an area of critical importance for the convergence in the economy. They emphasize that financial intermediaries spur investment by lowering the capital and enhancing the savings, which are vital for sustained growth in the long run in the economy. This viewpoint is consistent with Beck and Levine (2004) who showed that the banks together with the stock markets

are pivotal in driving the economy forward in terms of growth by improving allocation efficiency. Beck (2012) pointed to the risks and the benefits, the political issues of development of the financial sector and provided a more complete analysis of the role it plays in development of the economy. He focused on the need to balance the reforms which provoke efficiency and diminish risks in the financial sector. Laeven and Valencia (2013) offered a more comprehensive view on the effect of systemic banking crises on the growth of the economy. Such conclusions are important when analyzing the risks that come with a rapidly developing financial sector and underscore the need for strong regulatory policies. Yakubu and Abdallah (2021) showed the effect of banks in Sub-Saharan Africa on the region's economy and concluded that financial intermediation sways positively on growth of developing areas. Dutta et al (2023) in the Global Innovation Index described the relationship that financial innovation has on economic development and elucidated that such innovations were greatly needed to ensure sustained long-term growth.

As highlighted by Ramesh and Guruprasad (2024), the scope of digital financial services augments economic growth in Asia. This is important for Pakistan, where digital financial services are becoming increasingly important for development. Liu et al. (2024) studied the role of information technology in improving financial intermediation in the banking sector and its relation to the economy in Pakistan. Yakubu et al. (2021) reinforced the evidence which supports the tremendous influence of financial intermediation on the growth of the Turkish economy. This research could apply to other emerging markets where the economic growth and financial intermediation relationship is likely to be similar. Badeeb et al. (2017) highlighted the problem of relying too heavily on natural resources, focusing on the need for financial intermediation to encourage sustainable development in resource-rich countries to avoid the resource curse.

Several scholars have explored the linkage between economic development and financial intermediation pertaining to Pakistan. Husain (2011) examined the regulatory framework of Pakistan's financial system and put forth balanced reform policies, which aimed at stable, but economically growth oriented, particularly mindful financial stability. This work focused on the need of a developed financial structure for the sustainable growth of the economy. Naveed and Mahmood (2019) maintained that while financial liberalization enhances the growth prospects of the economy of Pakistan, the stability of the financial

system restrains its benefits. Adil and Jalil (2020) noted that better banking facilities as part of financial inclusion enhance strong economic growth in Pakistan. Tariq et al. (2020) analyzed the effect of financial development on the economic growth of Pakistan using a threshold model. They posited a nonlinear relationship whereby financial development drives growth only beyond a certain threshold. Afzal et al. (2021) analyzed the outcome of financial development indicators, such as ratio of private credit to GDP of Pakistan's economy. They find that these indicators positively influence growth, while the impact relies on the stability of the banking industry. Saleem et al. (2021) analyzed the interconnectedness between Islamic financial depth, financial intermediation, and growth in Pakistan's economy. They highlighted that aligning financial intermediation with Islamic financial principles can support sustainable economic growth.

Mehmood and Fraz (2022) discussed the poor state of financial markets in Pakistan and its implications for economic growth. They argued that underdeveloped financial markets limit the effectiveness of financial intermediation in supporting growth. Ansari et al. (2023) investigated the impact of non-performing loans on growth of Pakistan's economy, particularly under different political regimes. They found that high levels of NPLs negatively affect the efficiency of financial intermediation, thereby hindering growth. Ishfaq et al. (2024) posited that deepening of financial markets particularly ensures financial development, which in turns derive and stimulate growth. The findings confirmed the existence of causal association between growth of Pakistan's economy and financial development and

The literature demonstrates that there are many other drivers of economic growth that interact with financial intermediation to shape the trajectory of economic development. The studies suggest that for sustained and inclusive growth, it is essential to focus on these drivers as well that integrate with financial intermediation and foster a virtuous cycle of growth and development. For instance, the empirical analysis conducted by Boamah et al. (2018) proved that gross fixed capital formation has a marked impact on economic growth. Trpeski and Cvetanoska (2019) noticed that capital formation requires constant investment focus to promote development in transitioning economies. Financial developments and capital formation have a reciprocal relationship, and both together further influence the growth of the economy (Kong et al., 2020). It can be argued that policies designed to encourage both financial development and capital formation in the

form of fixed asset investments would greatly foster long-term sustainable economic growth in the economically lagging regions. Du et al. (2022) conducted an evaluation of infrastructure investment and found that such investment both accelerates the economic growth rate and enriches the quality of the economy by increasing productivity and promoting sustainable development. Del-Aguila-Arcentales et al. (2023) examined the impact of innovation on the competitiveness of the European Union countries and their compliances with the SDGs (Sustainable Development Goals) in the context of a holistic framework. Although these works were concentrated on innovation, the results imply that investment in innovation is essential for sustainable economic growth as it elevates competitiveness and compliance with the SDGs.

Public spending like education, health, and infrastructure development continues to be one of the most important drivers of economic development. Government spending on productive public investments such as infrastructure, innovation, research and development, and even human capital development increases the output of private capital and helps grow the economy. Also, strategically targeted public spending can help resolve the region's economic problems while advancing sustainable development (Barro, 1990, Aghion et al., 2009; Devarajan et al., 1996; Yasin, 2011). But, as highlighted by Perotti (2007), public spending for developing countries needs a framework that understands fiscal policy and he argued that public expenditure can stimulate or restrain growth depending on composition and resource allocation efficiency. Gurdal et al. (2021) indicated that balanced government spending and maintaining fiscal discipline is important while ensuring that public expenditure is directed towards growth-enhancing activities. Sebri et al. (2023) highlighted that the effectiveness of public expenditure in promoting growth is often compromised by poor governance and the misallocation of resources, particularly in resource-rich countries. Mazzucato (2011) introduced the concept of the "entrepreneurial state," arguing that proactive public investment in innovation and technology can drive economic growth. The suggested focus of the study was that government spending should not just be constrained to supporting traditional public goods. Rather, they should be tasked with actively market-shaping and nurturing innovation ecosystems.

Human development includes education, health, and quality of life. increased human development is both a driver and a byproduct of economic development. This is an area

of active research, for example, Sachs and Warner (1995) and Mehlum et al. (2006) studied the "resource curse" paying attention to the human capital and institutional factors that mitigated the negative effects of resource dependence. Barro (1997) argued that economic growth required investment in human capital, which had to and did precede development. A positive feedback loop where growth followed improvements in human development outcomes was also reported by Ranis et al. (2000). Bloom et al. (2004) placed equal emphasis on investments, particularly health improvements, for enhanced economic performance. Evidence that raising the quality of education substantially improves economic output was provided by Hanushek and Woessmann (2008). Grubaugh (2015) demonstrated stronger and sustained economic growth in countries with higher levels of human development. Elistia and Syahzuni (2018) reported a positive and significant impact of HDI on GDP per capita for ASEAN countries. Gulcemal (2020) determined that enhancements in HDI have a particularly strong influence on the growth of the economy in lower income countries. The study done by Rahim et al. (2021) showed that human capital development not only distracts from the negative impacts of the resource curse, but it also stimulates economic growth. Taqi et al. (2021) did note that the enhancement of the human development indicators is essential for the continued growth of the Pakistani economy and urged greater investment in education, health, and social services that function to promote long-term economic development.

The literature concerning economic growth and financial intermediation identifies the financial system to be a central accelerator of economic growth. Achieving financial inclusion represents Policy objective since there is considerable evidence that inclusive financial systems foster growth by broadening the scope of economic activities (Demirgüç-Kunt et al., 2017). On the other hand, the possible dangers of financial development too, especially in relation to innovation and globalization of finance must be taken into account (Sahay et al., 2015).

This section presents a detailed discussion on the relationship between financial intermediation and the growth of the economy. The body of literature places emphasis on financial intermediation, economy, and their correlations. The interdependence reinforces the notion that financial intermediation is one of the primary accelerators of economic growth. However, there is also concern about the risks that accompany accelerated growth of the financial sector and the need for careful regulatory supervision. The

literature contains important insights and also emphasizes rational governance for equilibrium between development of the financial sector and strengthening regulation of the financial sector so that intermediation promotes growth.

2.3. Nexus between financial intermediation and entrepreneurship

The relationship of entrepreneurship with financial intermediation is based on some economic theories which strongly stress the role of financial markets in the allocation of capital. By mitigating risks, information asymmetries and lowering transaction expenses, financial intermediaries enable for easy access to renew funds to finance start-up and expansion of enterprises (Schumpeter, 1934). In this light, financial intermediation works as a facilitator of entrepreneurial functions by extending the required capital and supplying other financial services. Entrepreneurs drive job opportunities, new innovations, and broader economic activity. Through financial intermediation, access to capital is provided, which enables entrepreneurs to launch new products, establish businesses, and promote further economic development (Acs & Audretsch, 2003). Endogenous theories of growth emphasize the role of financial intermediation in fostering entrepreneurship and innovation. These theories argue that competent allocation of funds by financial institutions to entrepreneurial activities and productive allocations results in economic growth. Their role is crucial in aiding this process since financial intermediaries help in spotting promising entrepreneurial ventures and in providing the requisite funds to market these innovations (King & Levine, 1993).

Access to finance is a considered a matter of concern for entrepreneurs as compared to established corporations because the former face higher level of uncertainty which makes it difficult for them to qualify for a regulated loan from traditional financial institutions. This warrants the attention of financial intermediaries such as microfinance institutions which cater to the needs of peculiar target groups (Gompers & Lerner, 2001).

Access to finance has been proven repeatedly in empirical studies to enhance the levels of entrepreneurial activity. Beck et al. (2005) performed a cross-country study and remarked that the development of the financial system, which is determined by the depth of financial markets and the availability of credit, positively impacts the degree of

entrepreneurship activity and well-functioning financial systems enhance the ability to spawn new enterprises, thus driving economic activity. Likewise, Klapper et al. (2006) studied the new firm registration in different countries and further validated the relationship between entrepreneurship and financial intermediation. They established that countries with developed and well-structured financial systems undergo heightened activity in the formation of new businesses, supporting the hypothesis that accessibility of finance is a primary factor determining entrepreneurial activity. Further research conducted by Ayyagari et al. (2016) confirmed that small and new firms have easier access to finance because their propositions, although risky, tend to be more innovative. This study also found that such firms are likely to enhance employment levels and contribute to economic growth because of external financing access. Cheng (2007) constructs a general equilibrium model to study the relationship of financial intermediation with entrepreneurship and economic growth. The model proves that financial intermediaries are essential by aggregating individual's funds into a pool and lending them to entrepreneurs who invest in modern production technologies. Besides encouraging the adoption of technology, this also improves the real income of individuals, which means that financial intermediation promotes economic growth indirectly by artificially altering saving patterns and facilitating entrepreneurial investment.

Financial intermediation, which involves the process by which financial institutions facilitate the availability of necessary finance to entrepreneurs are paramount for entrepreneurial ecosystem. Microfinance is generally considered an important form of financial intermediation for entrepreneurship, particularly in countries with limited banking services accessibility. Armendariz and Morduch (2010) discussed how microfinance institutions enable entrepreneurs to get small loans especially who lack collateral and have no credit history, facilitating them to initiate fresh ventures and expand existing small enterprises. Their research showed that entrepreneurship can be impacted positively and significantly by microfinance and poverty might be alleviated. Proven credit history and collateral required by banks for provision of loans to entrepreneurs, can be barriers for new and small businesses. As a result, banks that provide specific financial products aimed at the needs of entrepreneurs, such as small business loans and credit lines, can increase funding opportunities for entrepreneurs significantly (Berger & Udell, 2006). Microfinance institutions (MFIs) serve the financial

needs of low-income and neglected entrepreneurial populations. MFIs are able to grant modest, unsecured loans which allows entrepreneurs to initiate or grow their enterprises, especially in rural areas and developing economies. On the other hand, Beck and Demirguç-Kunt (2006) examined the factors hindering entrepreneurs from obtaining finance. They pointed out micro and macro-levels of financing to be a great impediment to entrepreneurship. However, microfinance as a mode of financial intermediation assists in overcoming these constraints. These findings highlight the need for greater financial provision in order to facilitate entrepreneurial activity. The role of microfinance in relation to entrepreneurship is well studied, and it is believed that microfinance assists in reducing poverty while fostering economic growth (Armendáriz & Morduch, 2010).

In addition to other sources of finance, venture capital is also considered important in promoting entrepreneurship. For example, Gompers and Lerner (2001) show that venture-backed firms in the United States tend to experience greater growth and innovation than non-venture backed firms. Their research underscored the role of venture capital as a specialized financial intermediary that gives out capital together with intensive guidance and critical business connections which are important for entrepreneurs. The venture capital involvement is attributed to the relatively high success rates of new ventures due to the ADDESS services that come with the venture capital funding. Similar to this, angel investors are private investors who provide preliminary funding for firms in exchange for equity stakes. Unlike venture capital firms, angel investors tend to invest their personal funds and are likely to be more personally attached to the outcomes of the ventures they help. For businesses that have not progressed sufficiently to justify venture capital funding, angel investment represents an indispensable source of financing (Sohl, 2013).

A strand of research indicates that financial development, which encompasses the growth of institutions and the sophistication of markets, is crucial for financial intermediation and entrepreneurship. Beck and Levine (2002) found that well developed and organized financial systems improve the capital allocation to investment in more productive and entrepreneurial industries. And also Levine (2005) gave thorough arguments about the relationship between the economic growth and finance, asserting that more developed financial systems foster entrepreneurship by improving the allocation of resources and access to capital. His findings suggest that offering policies aimed at reinforcing financial markets would encourage entrepreneurship in a country. More recently, Dutta and

Meierrieks (2021) claimed that financial development greatly enhances entrepreneurial activity, especially in countries with supportive structures and governance frameworks. They contend that the financial institutions are able to foster higher levels of entrepreneurship in countries with strongly developed financial markets.

Various researchers have pointed out that financial inclusion is very important in relation to financial intermediation and often regards it as one of the most important drivers of entrepreneurship due to the availability of financial services to all strata of society. Ajide (2020) showed that improvements in financial services access also help to elevate entrepreneurship, especially in Africa where few banking services are offered because of the lack of modern financial technologies, which squeezes innovation in serving the vicinities. More recently, Demirguc-Kunt et al. (2018) and Demirguç-Kunt et al. (2020) did a global analysis and emphasized that increased financial inclusion impacts entrepreneurial activity. Using the Global Findex Database, they demonstrated that countries with higher inclusion have active financial markets and more dynamic entrepreneurial activities because financial intermediaries are more willing to lend to small businesses. Klapper et al. (2016) analyzed the relationship between financial inclusion with women entrepreneurs. They contended that financing opportunities increases the probability of women owning businesses, thereby helping facilitate sustainable growth and declining poverty levels. This study emphasized the need to develop appropriate financial products geared towards women entrepreneurs.

Financial intermediation is a critical factor in promoting the entrepreneurship by providing adequate capital and financial services. At the same time, other factors may influence financial intermediation's effectiveness with entrepreneurship. Also, the economy and the business cycle certainly have an impact on the intermediation and entrepreneurship relationship. Baptista and Thurik (2007) suggested that recessions tend to increase the level of entrepreneurship as people search for different ways to earn a living. This form of countercyclical entrepreneurship reinforces the importance of financial intermediaries in capital provision during recessions. Faria (2015) examined the effects of technological change and the business cycle on entrepreneurship, claiming both should influence intermediation practices aimed at stimulating entrepreneurial activities. Put differently, during economic booms, financial intermediaries should focus on servicing established companies, while during economic slumps; they should support

innovative, growth-oriented start-ups. The development of financial technology (FinTech) improved the methods of funding accessible to entrepreneurs. Haddad and Hornuf (2019) elaborated on how peer-to-peer lending and crowd funding as FinTech innovations widened the scope of financing and, therefore, increased participation in entrepreneurial activities. From their findings, FinTech platforms have comparatively reduced the obstacles to entry for new businesses in neglected sectors. Li et al. (2022) observed that the growth of digital payment services and online lending in China has increased the entrepreneurial activity, particularly among younger and more sophisticated demographics. The research indicates that as time goes on FinTech will play an ever-growing role in defining the future of entrepreneurship.

The relationship between financial intermediation and entrepreneurship is also triggered by social and cultural factors. Welter (2012) analyzed the phenomenon of trust in the entrepreneurship and posited that in places where there is a greater level of social trust, financial intermediaries tend to foster entrepreneurship more because there is a lower level of risk associated with financing due to social trust. In fact, trust in financial institutions often augments appropriate channels of information and resources that are critical to the success of the entrepreneurs. Acs et al. (2008) looked into the impact of culture on entrepreneurship and pointed out that the perception about risks, innovations and failures deeply influence entrepreneurial undertakings. In most cases, high entrepreneurial cultures mean greater willingness from financial intermediaries to embrace risky investments with potential high payoffs are likely made supporting innovations, hence, increase economic activities.

A body of literature suggests that institutions are fundamental in determining the context within which financial intermediation and entrepreneurship occur. North (1990) emphasized that well-functioning institutions lessen transaction costs and uncertainty, enabling economic activities such as entrepreneurship that lead to economic growth. Acemoglu et al. (2001) made an empirical study on how differences in institutions, caused by historical colonization, have resulted in diverging economies, including the amounts of entrepreneurship in various countries. Acemoglu and Johnson (2005) explored this further by dividing institutions into property rights and contracting institutions, showing that without secure property rights, there can be no effective financial markets, which in turn will stifle entrepreneurial activities. Aidis et al. (2008)

pointed out that weak institutions in the form of corruption and bureaucratic inefficiencies can stifle entrepreneurial activities in Russia. Their comparison study demonstrates the importance of more robust institutions to effectively facilitate the relationship between financial intermediation and entrepreneurship. In their renowned work "Why Nations Fail," Acemoglu and Robinson (2012) argued that extractive institutions curb economic activities, while fostering an environment of spurring entrepreneurial activities which are promoted through inclusive institutions, which ration growth and expansion opportunities to all citizens. Galindo-Martín et al. (2020) study the effects of innovation and the quality of institutions on the entrepreneurship and economic activities of different countries, considering the level of institutional depth in those countries. The study finds that while robust institutions amplify the growth-sustaining effects of innovation-based entrepreneurial activity, weak institutions curb these advantages. This illustrates how governance and the quality of institutions are critical for fostering the impact of entrepreneurship and unlocking its growth potential.

Another aspect of literature emphasizes that policies of the government, regulatory frameworks and malpractices significantly sways the link between entrepreneurship and financial intermediation. Djankov et al. (2002) discussed about entry regulations which may serve as barriers to entrepreneurship, especially when these are strict or enforced corruptly. They emphasized that policies aimed at reducing these barriers might strengthen financial intermediation's role in supporting entrepreneurship. Obaji and Olugu (2014) emphasized the importance of government policy frameworks toward fostering entrepreneurship in emerging economies as well. Their concerns focused on policies that enable financing, lower regulatory constraints, and improve financial inclusion as critical for the promotion of entrepreneurship. Audretsch et al. (2022) studied the consequences of the size of government along with tax policy and corruption, concluding that high government size and high levels of corruption decrease entrepreneurial opportunities. These authors suggested that good governance together with rational and effective tax policies are required for an environment where financial intermediation would be appreciated and even engaged in to support entrepreneurial activities.

Another body of literature says that different kinds of corruption affect intermediation of finance differently as one of the other critical factors accompanied with lack of rational

influence on entrepreneurship. Corruption badly effects the functioning of the markets and entrepreneurship, particularly raises the cost of doing business (Shleifer & Vishny, 1993). Closest to this line of argumentation is Treisman (2000), who conducted a study on the phenomenon of corruption transnationally, claiming that there exists a strong relationship between rampant corruption and low entrepreneurial activity because corruption erodes trust, raising the risks and costs of financial intermediation. Also, Fisman and Svensson (2007) furnished evidence on the impact of corruption and taxation on firm growth, suggesting that there exists a negative relationship between firm growth and the entrepreneurial environment. Their conclusion is that for financial intermediaries to actively nurture entrepreneurship there must be an environment of low corruption and reasonable tax policies.

Policies and regulations are invaluable in establishing the necessary infrastructure for self-employment and entrepreneurship. Djankov (2009) stated that overly tight regulations stifle entrepreneurial activity because of increased costs of finance and greater complexity. Policies that foster inclusion and innovation from a financial perspective during that time proved to greatly enhance entrepreneurial activity. Edwards (2021) worked out that deregulation in some economies improved the effectiveness of financial intermediation which, in turn, stimulated entrepreneurial activity. This study argued that governments can enable financial institutions to effectively provide capital and necessary services to entrepreneurs if the regulatory framework is less stringent, which would encourage business creation and spur economic growth.

La Porta and Shleifer (2014) in their study on the informal economy, focused on the relation between the informal economy and its regulation by formal financial systems. They explain that countries with lax financial regulations and limited access to finance tend to have a high proportion of entrepreneurial activity in the informal economy. So, this study sought to emphasize the need for greater financial regulation in order to better incorporate informal enterprises into the economy so they can access finance and grow.

This review seeks to synthesize the literature on the intersection of entrepreneurship within the context of a developed system of financial intermediaries, emphasizing the critical importance of access to finance. It also seeks to explain the various factors that intertwine with the relationship. The literature on financial intermediation and

entrepreneurship pinpoint the most valuable ingredient of entrepreneurial activities, which is the availability of capital. Empirical studies show that organized and efficient financial systems are synonymous with high entrepreneurial activity, which in turn supports the need for strengthened financial systems and infrastructures. On the contrary, the regulatory framework, state of financial market, and the presence of ancillary services like business development assistance and training can all impact the degree to which financial intermediation aids entrepreneurship (Beck & Demirgüç-Kunt, 2006).

2.4. Nexus between Entrepreneurship and Economic Growth

The link between entrepreneurship and economic growth is supported by numerous economic theories. The theories demonstrate that entrepreneurship stimulates innovation, creates employment opportunities, improves efficiency, and contributes to the overall development of economies. In his famous book, "The Theory of Economic Development" by Schumpeter (1934), he coined the term "creative destruction" whereby he explained how innovation by entrepreneurs disrupts existing industries and consequently new industries are formed, transforming the economy. Entrepreneurs are viewed as change makers who implement novel products, steps, and strategies that improve productivity and propel the economy forward. Similarly, Romer (1986) and later Lucas (1988) also placed increased focus on the role of entrepreneurship in endogenous growth theory. In these frameworks, entrepreneurial innovation and the spread of new technologies are crucial factors of sustaining economic growth. Concerning the combination of resource wealth and economic growth, Auty (2001) studied how resource endowments shape entrepreneurship and its relation to economic advancement. In resource-rich economies, entrepreneurship promotes economic diversification, while in resource-poor economies, it tends to enhance innovation and development. Similarly, Baumol (2003) put forth the concept of productive entrepreneurship which acts as a supplementary influencer to economic growth via innovations and efficiency improvements. He further commented that the impact of entrepreneurship on economic expansion is highly dependent on the context of the institutions, where strong institutions promote productive entrepreneurship while weak ones lead to unproductive or even destructive entrepreneurship. Along the same lines, Acs et al. (2008) pointed out that by unmatched market innovations, which drive the economy, entrepreneurship is said to lead economic growth making at the same

time “creative destruction” coined by Schumpeter (1934). Also, Levie and Autio (2011) built the relevance of entrepreneurship with economic development by explaining how industries undergo entrepreneurial driven change, new industries emerge while existing ones are transformed, emphasizing the role of high-growth firms, or “gazelles,” for sustained economic growth. Most recently, Acs et al. (2013) proposed The Knowledge Spillover Theory of Entrepreneurship, which involves the concept of entrepreneurship enabling the transfer of knowledge and innovation at a firm and industrial level. These spillover effects increase productivity and economic growth through the adoption of new techniques and technology. From this perspective, an entrepreneurial endeavor helps facilitate the flow of knowledge from the university and research institutions to the market for the economy to grow. Entrepreneurs serve as an innovation’s agent that makes it into a business venture, aids competition, and culminates into better results for the economy.

Empirical studies consistently demonstrate that entrepreneurship exhibits a favorable influence on economic expansion, although the essence and robustness of this association can be different according to the nature and type of entrepreneurial activities and the context in which it occurs. Empirical studies have provided substantial evidence that economic growth is influenced positively by entrepreneurship. For instance, Stel et al. (2005) in a cross country analysis found that there is a positive association of entrepreneurial activity with growth rate of the economy, especially in countries that are developed. Their findings suggest that entrepreneurship is a critical factor in transitioning economies from low to high growth trajectories. Entrepreneurship contributes significantly to economic expansion, particularly in countries with high income where innovation-driven entrepreneurship is more prevalent and the quality of entrepreneurship, measured by the innovation output, is more important for economic growth than the sheer number of new business startups (Acs et al., 2008).Another cross-country analysis by Wennekers et al. (2010) also revealed the same findings regarding entrepreneurship growth nexus however, their study highlighted that the influence is particularly strong in those high income countries where institutional frameworks support innovation-driven entrepreneurship. Rostami et al. (2019) examine the impact of competitiveness and entrepreneurship on economic performance across factor-driven, efficiency-driven, and innovation-driven countries. Using panel data regression, the study finds that the determinants and effects of entrepreneurship vary by development stage. While

infrastructure and basic requirements are more relevant in factor-driven economies, innovation and technological readiness are key in innovation-driven contexts, highlighting the heterogeneous nature of entrepreneurship's role in economic growth. More recently, Kim et al. (2022) also conducted a cross-sectional empirical analysis and further validated the evidence of favorable and strong entrepreneurial influence on growth of the economy. They further ascertained that countries where entrepreneurial activities are relatively high are likely to grow economically more rapidly.

It is argued that entrepreneurship influences economic progress directly, through the creation of new businesses and jobs, and indirectly, by increasing competitive pressures that lead to more efficient markets. Van and Versloot (2007) reviewed the literature on the economic benefits of entrepreneurship and found that entrepreneurial activity significantly contributes to innovation, creation of jobs, and output of the economy. Moreover, small businesses that are often established by entrepreneurs are considered to be the significant drivers of employment generation and diversification of the economy, particularly in those countries which are developing. Ayyagari et al. (2011) emphasized that supporting entrepreneurial ventures, either small or medium, is a key to achieve sustainable economic growth. Galindo and Méndez-Picazo (2013) conducted a study and concluded that an integrated relationship between entrepreneurship, innovation, and economic development in Europe showed that entrepreneurship directly contributes to economic development by stimulating technological change and productivity improvement. Besides, policies that foster entrepreneurial activities and stimulate innovations are important for sustainability and the overall economy.

Some studies emphasize the importance of developing an entrepreneurial ecosystem because it enables innovation and growth-oriented ventures. Acs et al. (2015) pointed out that countries where entrepreneurial activities are conducted at a greater scale and concentrated on key high-growth sectors are likely to experience rapid economic expansion. For the same reasons, Guerrero et al. (2016) studied the competitiveness of regions concerning entrepreneurial universities and their role in economic expansion. The results confirmed the strong prospects for innovation and economic growth in regions with dynamic entrepreneurial universities that act as centers for knowledge and information, helping to foster the construction of entrepreneurial ecosystems that enhance the productivity of the economy of the region. Spigel and Stam (2018) demonstrated that

entrepreneurial ecosystems that foster innovation are vital to economic growth and suggested that policymakers should seek to design highly productive entrepreneurial ecosystems where their impact would be maximized. They argued that the right enabling framework, which encompasses the requisite finance and a supportive culture predisposed to risk, facilitates the transformation of entrepreneurial activity into economic development. In addition, Burchi et al. (2021) examined the role of financial literacy on sustainable entrepreneurship, particularly how financial skills promote entrepreneurial activities directed toward economic development Further, Hameed et al. (2023) recently proposed the concept of inclusive entrepreneurial ecosystems together with a framework designed to evaluate the effectiveness of such systems and their overarching impact on the economy. Furthermore, the authors emphasized the need for inclusion within entrepreneurial ecosystems and their effects on women and other economically marginalized groups who tend to support sustained economic growth.

The growing economy provides a refreshing avenue for modern businesses in the periphery of the digital economy. Digital entrepreneurship is the application of new technologies for developing and managing a business, often resulting in significant socioeconomic impacts. Feyen et al. (2023) analyzed the role of fintech concerning entrepreneurship and the evolution of finance. Their study demonstrated how entrepreneurs are increasingly benefiting from the financial services industry because of its fintech innovations. This improved access to credit is crucial to stimulate entrepreneurship and economic growth, more so in the underdeveloped regions.

Creation of new goods, services, and processes is the main driving force behind economic transformation and increased productivity of any economy. This is precisely why innovation is a vital area through which entrepreneurs can help in productivity enhancement in the economy. Wennekers and Thurik (1999) suggested that policies promoting entrepreneurship could be particularly effective in enhancing economic performance. Therefore, countries are likely to experience sustained growth in the economy which exhibit elevated entrepreneurial activities, because of innovation and competition that entrepreneurship fosters. In another perspective, Audretsch and Thurik (2001) discussed the shift from a managed economy, where large firms dominated, to an entrepreneurial economy characterized by a greater emphasis on innovation and flexibility. This shift, they argued, has been crucial for sustaining economic growth in the

face of global competition and technological change. Another research by Acs and Varga (2005) signified that evolution of entrepreneurial culture leads to elevated entrepreneurial activities which eventually results in robust innovations and sustainability in the economy. Therefore, accelerated economic progress is the outcome in the regions that exhibit organized entrepreneurial culture and support innovation ecosystems. The importance of supporting high-tech entrepreneurship as a strategy for enhancing economic growth was highlighted by Thurik et al. (2008) who explored how entrepreneurial activity drives innovation in high-tech industries. Their work showed that regions with a high concentration of high-tech startups tend to experience more rapid economic growth due to the spillover effects of innovation. There is a claim that opportunity entrepreneurs tend to be more creative and establish businesses with significant room for expansion. Fairlie and Fossen (2018) found that entrepreneurship which is driven by opportunity usually contributes to more rapid expansion of the economy through innovative ideas.

One of the most significant ways entrepreneurship contributes to economic growth is through job creation. New businesses, particularly during their early stages, are major sources of employment. Birch (1979) famously identified that small firms and startups are the primary sources of job creation in the economy. This finding has been supported by numerous subsequent studies, which have shown that entrepreneurial firms, especially those in the growth phase, contribute disproportionately to net job creation. For instance, Neumark et al. (2011) while analyzing the association of employment generation with entrepreneurship in the United States found that regions with higher rates of new firm formation experience faster employment growth. The study emphasized the importance of supporting entrepreneurial ecosystems as a strategy for regional economic development. While many startups fail, the net effect of entrepreneurial activity on employment is positive, as successful ventures often grow rapidly and hire extensively was highlighted by Haltiwanger et al. (2013) who found that a significant portion of the employment opportunities is created by young businesses, most of which are founded by entrepreneurs. Fostering entrepreneurship is crucial for economic resilience and long-term growth as concluded by Stangler and Bell-Masterson (2015). Their study explored the role of entrepreneurship in job creation across several US regions and found that high density of entrepreneurial firms reduce unemployment and foster expansion in the economy.

Sustainable entrepreneurship integrates economic objectives with social and environmental considerations, contributing to long-term inclusive expansion in the economy that is ecologically responsible. As noted by Burchi et al. (2021), entrepreneurs with proper financial education are well positioned to champion economically viable business programs that encounter social and environmental problems. Similarly, Van (2022) studied how self-sustaining businesses could be integrated into the entrepreneurial ecosystem through fostering entrepreneurial coalitions.

The findings underscored that sustainable entrepreneurship is promoted by these organization and growth of the economy is stimulated. The role of internationalization in stimulating innovation among SMEs in developing economies has been examined by Smallbone et al. (2022). Their study found that the probability of innovation increases in those SMEs that are involved in international markets and the anticipated result is continued economic growth. They additionally argued that policies aimed at fostering the internationalization of SMEs need to be developed as part of economic growth strategies.
The impact of entrepreneurship on economic growth is deeply conditioned by the institutional quality. Strong institutions are capable of protecting property rights, enforcing contracts, maintaining the rule of law, and promoting entrepreneurship. It is expected that productive entrepreneurship that promotes further development of the economy will be more pronounced in strong institutions that encourage innovation and creation because such institutions are more likely to reward innovation and value creation. As Baumol (2003) differentiated and defined productive, unproductive and destructive entrepreneurship, he proposed that the type of entrepreneurship prevailing in an economy is attributed to the incentives sponsored by the institutional structure. Also, strong institutional frameworks increase the likelihood that entrepreneurial actions will result in innovations, formal businesses, and significant economic impacts. In a comparative approach, Acemoglu and Johnson (2005) emphasized institutional differences to explain the variation in economic performance across countries. Where institutions are weak, entrepreneurship is likely to be informal and unproductive and make a lower contribution to economic growth. Levie and Autio (2008) argued that policymakers targeting economic growth should focus on strengthening institutions. They evaluated the Global Entrepreneurship Monitor (GEM) model and concluded that

financing, education, and a regulatory framework serves as an institution's policy support and is critical for transforming entrepreneurial activity into economic growth.

Weaker institutions may result in more unproductive or even destructive forms of entrepreneurship, which could stifle economic development (Baumol, 2013). He suggested that productive entrepreneurship which aids economic development tends to thrive in strongly institutionalized environments, while the type of entrepreneurship that predominates in an economy is largely determined by the prevailing institutional context. In addition, countries possessing stronger institutions are predicted to have more robust economic impacts from entrepreneurship because those environments mitigate the starting and growing risks of businesses (Acs et al., 2015). They stressed that the quality of the institutional framework is vital with regard to the efficiency (or effectiveness) of the transformation of entrepreneurial activities into economic growth. Along the same lines, Estrin et al. (2013) studied the impact of institutions on entrepreneurship in transition countries. They concluded that institutional changes aimed at improving the business climate, especially lowering corruption and improving the availability of finance, are critical to fostering entrepreneurship and its productive role in economic growth.

The public policies and institutional framework have a profound impact on the relationship between entrepreneurship and economic development by developing the entrepreneurial framework and providing needed guidance and support. Strong national competitive advantage policies and strict institutional frameworks as claimed by Porter (1990) increase entrepreneurship and economic growth. Policies that foster entry, access to finance, and innovation are also critical for entrepreneurial activity stimulation (Ács et al, 2009). Such policies enable thriving entrepreneurship, which strengthens sustained economic development. Governments facilitate spending on research and development, education, and infrastructure positively impacts entrepreneurial activities by fostering favorable conditions for business and growth (Nica, 2013). The study revealed that the distribution of government spending plays a vital influence in defining the entrepreneurial landscape. Such public policies that are aimed at nurturing entrepreneurship and expediting the economic growth of a nation are balanced and value reinforcing. Under these frameworks, it is possible for incubators and accelerators to assist new ventures through funding, mentoring, and networking (Qureshi et al., 2021). They studied the

entrepreneurial ecosystem development in Pakistan as a result of business incubation and acceleration. In the same way, Shahzad et al. (2012) researched the role of incubation in promoting women entrepreneurship in Pakistan. Their study showed that business incubators contribute positively towards women entrepreneurs' empowerment by providing them the resources and support needed to surmount structural barriers to entry. Such an empowering strategy deepens the economic engagement of women while boosting the economy as a whole. Also, Arfeen and Saranti (2021) studied the e-government policy strategies for Pakistan claiming information technologies and e-government systems can stimulate entrepreneurship by broadening the information access, removing bureaucratic barriers, and simplifying business operations.

Some scholars focus on the link between economic growth and entrepreneurship in the case of Pakistan, which provides a glimpse of the problems as well as the opportunities in the country. For example, Afza and Amir (2009) investigated the social impact of enterprise development on underprivileged women in Pakistan, emphasizing the women entrepreneurship phenomenon as an empowering force for the marginalized which promotes economic development through socioeconomic inclusion. Mustafa et al. (2018) discussed the importance of small and medium enterprises on the economy and argued that largely entrepreneurial driven SMEs contribute significantly to employment and economic development. They illustrated the role of SMEs in the economy of developing countries and argued that there is a need for more proactive and finance-oriented policies to encourage these businesses. Nabi et al. (2018) examined how educational programs on entrepreneurship influence college students' interest in entrepreneurship, stating that such programs are capable of transforming attitudes toward entrepreneurial activity and, in turn, foster economic development. The importance of youth empowerment for the development of the economy is directly proportional to harnessing their full potential (Gill et al., 2019). Programs of skill training, creation of resources, and opportunity recognition seek to enable students which in turn enables the economy too. Hussain et al. (2019) examined the impact of microcredit loans on women entrepreneurship, stimulating economic growth, and alleviating poverty in developing countries. The insights gained from this study served to demonstrate the impact of microcredit in fostering sustainable economic development. Memon et al. (2019) assessed the impact of entrepreneurial ecosystem on economic development of Pakistan and argued that lack of proper ecosystem, financial infrastructure, and policy frameworks obstruct entrepreneurship and

economic development. Kiani and Ali (2019) stressed on the necessity of efficient functioning of financial system for such a system serves to support entrepreneurship. An efficient financial system makes available the necessary funds that allow new businesses to be started, which enhances economic development. In his analysis of the youth dynamics in Pakistan, Javed (2020) underscored the potential of entrepreneurship in economically empowering the youth and stimulating economic prosperity. It was also determined that provincial policies aimed at fostering the younger labor force integration into the economy will advance development within that region. Kumar and Alwi (2023) studied the impact of entrepreneurial education on the economy and showed that spending on entrepreneurial education strengthens the entrepreneurial skills of individuals which have a positive impact on the economy.

This literature review describes the relationship between economic development and entrepreneurship, utilizing both theoretical and empirical frameworks to illustrate the value of entrepreneurship in fostering economic development. The literature consistently supports the opinion that entrepreneurship accelerates growth of the economy; primarily make major contributions to the vitality and resilience of economies by innovating, creating jobs, and increasing productivity. Policies that promote entrepreneurship, improve access to finance, and strengthen institutions are likely to enhance economic growth by fostering a more dynamic and innovative economy.

2.5. Research Gap

To summarize the research, it is determined that various perspectives of finance, entrepreneurship, and economic growth have been intensively studied. These studies offer meaningful understanding of how financial intermediation influences economic growth, how it impacts entrepreneurial activities, and how entrepreneurship drives economic growth. However, the current literature largely examines these relationships in isolation, with limited exploration of the interconnections between all three domains empirically.

Despite the substantial body of research, there is a notable gap regarding investigation of the interconnectedness between financial intermediation, entrepreneurship, and growth of the economy. Specifically, entrepreneurship's mediating role between economic growth and financial intermediation has not been thoroughly explored. This gap is particularly

evident in the context of emerging economies, such as Pakistan, where the interplay between these factors remains under-researched.

This study intends to overcome this gap through empirical testing of entrepreneurship's mediating impact between financial intermediation and economic growth. By doing so, it seeks to integrate the three previously isolated domains into a cohesive framework, providing a more comprehensive understanding of how these factors interact. The use of structural equation modeling (SEM) in this context is a novel contribution, as no prior studies have applied this methodology to explore these relationships.

Moreover, this research also fills a geographical gap by focusing on Pakistan, where the literature on this topic is sparse. By including data from innovation, efficiency, and resource-driven economies, this study not only contributes to the existing pool of knowledge, while also providing new perspectives on the implications of these relationships in a variety of economic settings.

In summary, this research addresses significant gap in the current literature by empirically investigating the interconnectedness of financial intermediation, entrepreneurship, and economic growth by testing the mediating role of entrepreneurship, which has been largely overlooked in previous studies. This study applies structural equation modeling to explore these relationships in economies driven by innovation, efficiency and resources including Pakistan, thus introducing a new methodological approach, thereby contributing to the global understanding of these phenomena.

This study opens new possibilities for research in future and provides useful insights for policymakers, financial institutions, and educational institutions in formulating strategies and curricula related to finance, entrepreneurship, and economic growth.

CHAPTER – 3

RESEARCH METHODOLOGY

3.1. Introduction

The relationship between financial intermediation and intermediaries, and entrepreneurship and economic growth is analyzed in a comprehensive framework presented in this chapter. To achieve the goals of this study, a model is framed to assess not only the direct impact of financial intermediation on economic growth and entrepreneurship; but also, its indirect impact on economic growth channeled through entrepreneurship. This chapter shows a full description of the statistical data, research methods, and analysis tools that are used in the study. The first section of this chapter discusses the research design whereas the subsequent sections deal with the model, the data, and operational definitions of the variables and the technique of constructing the instruments for the research. The last part outlines suitable econometric methods used for time series and panel data analysis that provides the groundwork for the empirical investigation.

3.2. Research Design

A research design describes a framework of research plan that intends to meet the goals of a given research project (Saunders et al., 2011; Sreejesh et al., 2014). The research strategy of this study is non-experimental and non-contrived because panel and time series analysis involves the collection and observation of data without any alterations or intervening activities over a set period. Such an approach enables researchers to identify temporal factors and associations that yield valuable insights Sekaran & Bougie (2016). A deductive approach is undertaken in this study along with the explanatory approach under the positivist research philosophy. This methodology starts from a broad theory then narrows down to a specific area of practice and research, which is accompanied by quantitative data. Both panel and time series analyses are conducted in accordance with the ethics of positivist research since they emphasize empirical, quantitative data, objective examination, and testing of pre-established hypotheses. In relation to the

fundamental tenets of positivism, they provide the systematic and scientific approach to interpreting data patterns and relationships over time.

Data for time series analysis for Pakistan as well as cross-country analysis for a panel of eighty-four nations are sourced from Word Development Indicators (WDI), World Governance Indicators (WGI), and the International Labour Organisation (ILO) of the World Bank. The data consists of a panel of eighty four nations classified by the Global Entrepreneurship Monitor (GEM). The countries have been categorized into resource-driven, factor-driven, efficiency-driven, and innovation-driven countries. Additional information is coming in the later sections of this chapter.

It is important to conduct time series research on Pakistan because of the country's low rank in the Global Entrepreneurship Development Index (GEDI) and its weaker economic position. In addition, it is also essential to conduct cross-country analysis using panel data because, despite the fact that it is widely acknowledged that financial intermediation contributes significantly to encouraging entrepreneurial ventures and economic expansion, there is a lack of understanding regarding the ways in which this relationship differs in the countries with different phases of development, specifically economies that are driven by resources, economies that are driven by efficiency, and economies that are driven by innovation.

3.3. Theoretical Framework

According to the financial intermediation theory, financial intermediaries are crucial to the economy's ability to grow sustainably. This theory also emphasizes the central bank's role in overseeing and regulating these intermediaries. The contemporary theory of financial intermediation primarily examines the roles and impact of financial intermediaries on the economy, as well as the implications of government regulations on these intermediaries (Andries, 2009).

The foundation of financial intermediation theory lies in the concepts of informational asymmetry and agency theory. Financial intermediaries are present because of the presence of transaction costs, inadequate information, and regulatory requirements. These

informational asymmetries lead to market imperfections and increase in transaction costs, in contrast to the flawless financial markets of the neo-classical theory (Gurley & Shaw, 1960). Financial intermediaries arose in order to minimize these expenses and safeguard the savings of individuals against potential hazards that may impact their ability to access funds. In addition, these financial intermediaries are capable of achieving economies of scale by making investment in projects they deem feasible (Diamond & Dybvig, 1983; Diamond, 1984).

The second approach to financial intermediation was introduced by Benston and Smith (1976) and Fama (1980), which centers on transaction costs and is in accordance with the ideal markets theory. The emphasis of this approach is on the disparities in the technologies employed by the participants. Financial intermediaries are regarded as entities that decrease expenses by utilizing sophisticated transaction technologies. Transaction costs encompass not just the expenditures associated with transferring funds or foreign exchange, but also the costs linked to research, evaluation, and monitoring. Financial intermediaries are essential in altering the attributes of assets, such as maturity dates and liquidity, in order to offer liquidity and enhance investment diversification.

The third approach to financial intermediaries is centered around the regulation of money creation, savings, and financing of the economy which was introduced by Guttentag and Lindsay (1968) and further expanded upon by Merton (1995). The emphasis is on the choice of regulatory techniques which have a direct impact on the liquidity and solvency of intermediaries. Also, Diamond & Rajan (2000) show that any regulations or restrictions imposed related to the capital of the intermediaries greatly affect their financial stability, ability to refinance, and strategies to recovery of debt.

Certain perspectives, like the one including the theory of financial intermediation, argue that sophisticated financial systems foster economic development by diminishing the gaps in knowledge and transaction costs (Diamond, 1984; Rajan, 1992).King and Levine (1993) claim that the progress of a financial system increases the likelihood that financial intermediaries will convert household savings into healthy investments, which facilitates investment in technology, increases productivity, and capital accumulation. Empirical studies show that many countries with effective systems of financial intermediation have a greater chance of sustaining high economic growth (Levine, 2005). Beck et al. (2007)

propose that finance-growth nexus theory attempts to establish connection between finance and economic growth, they further assert that the development of finance leads to economic growth through three principal routes: improved access to loans, increased savings mobilization, and enhanced entrepreneurship. Rajan and Zingales (1998) and Stiglitz (2000) have engaged in ongoing discussions regarding the optimal level of financial intermediation and the potential issues it may present, such as income inequalities and instability in the financial system.

In our dynamic world, innovation and entrepreneurship are essential for stimulating economic progress. The modern economy, which is founded on knowledge, greatly depends on rapid improvements in technology. In order to participate in entrepreneurship, individuals must have cognitive aptitude and a thorough understanding of creativity. The concept of innovation and entrepreneurship developed by Schumpeter is widely applicable and continues to evolve within the framework of Neo-Schumpeterian economics. Joseph Alois Schumpeter argued that innovation is the most important factor in historical development. According to him, innovation is what propels economic progress, and entrepreneurs are crucial in bringing forth these advances. (Hanush & Pyka, 2007).

Schumpeter (1912) emphasized the role of entrepreneurs and made a significant contribution by emphasizing that evolution of economic history is propelled by entrepreneurship, which is both a unique element of production and an uncommon social input. Schumpeter's definition of entrepreneur is functionally oriented and specifically pertains to actions and functions associated with invention. Entrepreneurs have the role of transforming the production process by capitalizing on a new invention or untested technological opportunity to create a new product or produce an existing one in a different manner. They achieve this by discovering new sources of materials or markets for their products, as well as by reorganizing industries (Schumpeter, 1942). Within the current discourse around entrepreneurship and capitalism’s economic progress, Schumpeter's idea of “entrepreneur” provides banks (and the financial system) with the opportunity to introduce innovations into the economy. Schumpeter contended that individuals who desire to generate profits must engage in innovation. This will result in a more varied use of the economy's current productive assets (Schumpeter, 1934).

Schumpeter proposed that innovation is a critical driver of competitiveness (Porter & Stern, 1999) and economic dynamics (Hanush & Pyka, 2007).

A key factor in promoting economic growth is entrepreneurship, through its influence on innovation, job creation, and the dynamic nature of the market (Audretsch & Keilbach, 2004). The Schumpeterian growth theory highlights the significant impact entrepreneurs have on the introduction of innovative products, processes, and business models, leading to the disruption of existing markets and the promotion of economic progress (Schumpeter, 1942). The phenomenon of creative destruction within economies leads to higher levels of productivity and competitiveness, hence fostering sustainable economic growth (Carree & Thurik, 2010). As a result, in a variety of contexts, entrepreneurial activity and economic growth are directly correlated (Acs & Armington, 2004). This association is substantiated by actual research. Countries with entrepreneurial ecosystems that provide support, including access to finance, favorable regulatory environments, and a culture that encourages risk-taking and innovation, tend to exhibit greater levels of economic dynamism and resilience (Wennekers & Thurik, 1999).

As opposed to just being an extra factor to the relationship of financial intermediation and economic growth, entrepreneurship acts as a mediator and is a more central figure to that connection. Financial intermediation aids in making the necessary capital available to business proprietors for starting, growing, and innovating new business activities (Parker, 2005). These intermediaries promote entrepreneurial activities that bring increased productivity and broader economic opportunities by alleviating financial constraints and expanding risk sharing. In addition, financial institutions enhance the supply of venture and other capital funds that are essential for entrepreneurial activities (Brush et al., 2001). This underscores the role of financial intermediation in fostering increased entrepreneurship that in turn leads to job creation, wealth, technological and economic advancement (Claessens, 2009).

In analyzing the intricate relationships among financial intermediation, entrepreneurship, and economic growth, additional context such as economic literacy, regulatory policies, and institutional frameworks are equally as important, noting Amoros and Cristi (2008). The Global Entrepreneurship Monitor of 2020 reports that policies aimed at boosting

financial inclusion, credit access for SMEs, and the entrepreneurial skillset improvement have a positive effect on economic growth through emphasized intermediation impact.

In the end, this framework integrates concepts of theories with empirical evidence to explain how financial intermediation and entrepreneurship jointly impact the growth of the economy. Therefore, this research examines the relationship between financial intermediation, entrepreneurship, and economic growth.

3.4. Conceptual Framework and Modeling

To develop an understanding of the relationships among financial intermediation, entrepreneurial activities, and economic growth, it is important to analyze not only the direct impacts that financial intermediation and entrepreneurship have on economic growth, but also the indirect impacts of financial intermediation on economic growth through entrepreneurship. Therefore, based on theoretical framework and in order to shed light on these dynamics, this conceptual framework undertakes an investigation drawing on mechanisms suggested by endogenous growth theories in which the association between financial intermediation, entrepreneurship and economic growth is dynamic.

The seminal contributions of Romer (1986), Lucas (1988), Grossman and Helpman (1991), Aghion and Howitt (1992) and Howitt and Aghion (1998) are pivotal in the development of endogenous growth theory that established an association between economic growth and financial system development and incorporated imperfect markets and R&D to the growth model. The models used in these studies focused on explaining sustained economic growth by emphasizing the role of finance, innovation, knowledge and human capital, rather than solely relying on exogenous factors.

The link between financial intermediation, entrepreneurial activity, and economic growth is not solely incremental; rather, it is interactive and complex, as the financial intermediation's impact on economic growth is transmitted through entrepreneurial activities (King & Levine, 1993b).

An economy's ability to grow depends on financial intermediation, the process by which financial institutions mediate the flow of funds between a saver and a borrower. (Levine, 2005). The secondary source of finance available through independent intermediaries, allow a business owner to initiate a new venture, expand their business, or invent something new (Parker, 2005). This is important for developing and underdeveloped countries. This is because financing still remains to be a major hurdle in entrepreneurial activity and economic development (Cournede et al., 2015). Moreover, the indirect effect that financial intermediation has on economic growth through entrepreneurial activities strongly signifies the need to understand the contextual factors that either promote or inhibit entrepreneurial activities. Critical components of the entrepreneurial ecosystem include financial knowledge, regulatory and institutional frameworks, and government support (Brush et al., 2001). Nations having an ecosystem that encourages entrepreneurship, characterized by soft regulations, available venture capital, and a culture of risk-taking and innovation, tend to have more economic growth and job creation (Global Entrepreneurship Monitor, 2020).

The frame work of this study incorporates financial intermediation and entrepreneurship as endogenous which are mutually influenced by one another over time rather than linear frameworks in which they are treated as exogenous factors of economic growth. The graphical representation of conceptual framework is illustrated in Figure 3.1.

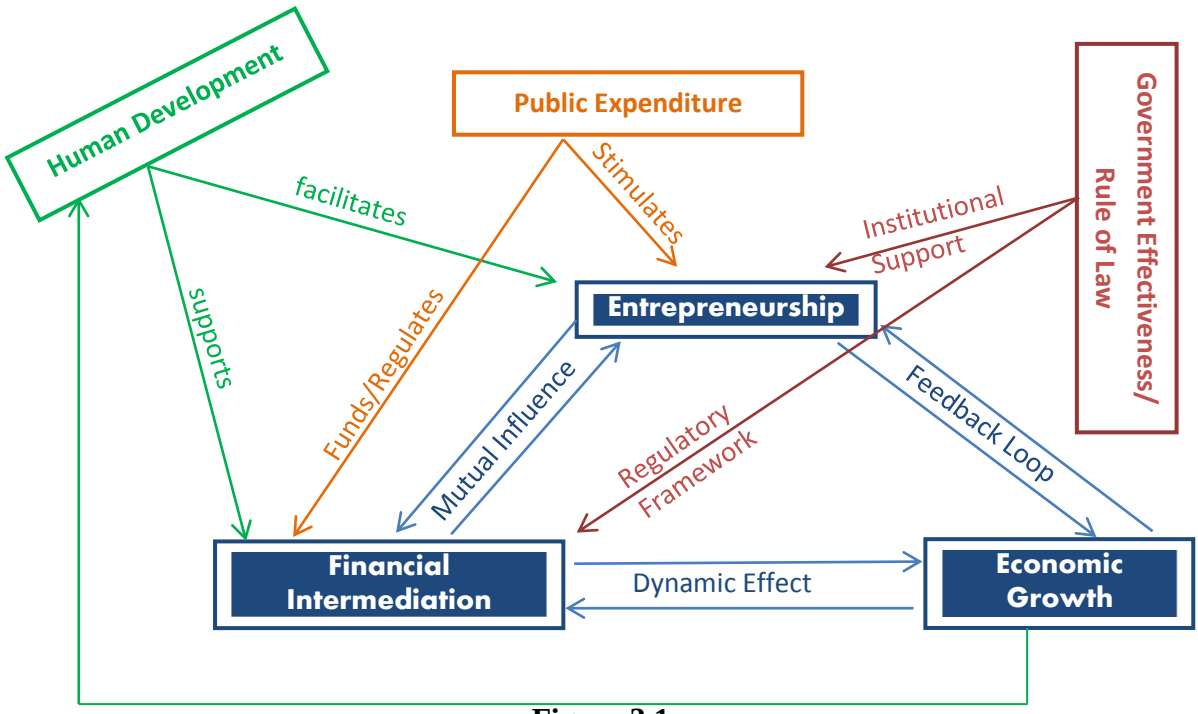

Figure 3.1

Economic growth is not solely a function of financial intermediation, but it is modeled from its reciprocal impacts on the financial sector and entrepreneurship which are shaped by institutions, human development, and the quality of governance. Financial intermediation, which is defined as the efficiency and depth of the financial systems and markets, not only promotes economic growth by alleviating credit constraints and enhancing capital allocation; it is also influenced endogenously by prior economic performance and the level of entrepreneurial activity in the economy. Also, entrepreneurship is not simply exogenous and independent, but depends on previous levels of financial intermediation, human development, and prevailing economic conditions, and in turn, contributes to economic production via innovations and dynamism in the private sector. This reciprocal causality leads to a feedback mechanism by which economic growth improves the financial system and the capacity of institutions, which in turn foster even more entrepreneurship and innovation-driven growth. Integrating human development alongside governance variables acknowledges the contribution of soft infrastructure in enabling these relationships and strengthens the focus of the framework beyond the depth of finance towards the quality and inclusiveness of finance.

To grasp the interdependencies and feedback loops within these relationships, the framework uses a system of simultaneous equations, which enhances understanding of the interplay between financial intermediation (FI) and economic growth (EG) via entrepreneurship (ENT). A conceptual model here created reflects the mechanisms of endogenous growth that incorporates financial intermediation and entrepreneurship within a dynamic context and illustrates their relations with growth using structural equation modeling (SEM). The first model hypothesizes a direct impact of financial intermediation on economic growth. The second model assumes financial intermediation affects entrepreneurship directly. The third model then explains the effect of financial intermediation on economic growth through the entrepreneurship channel.

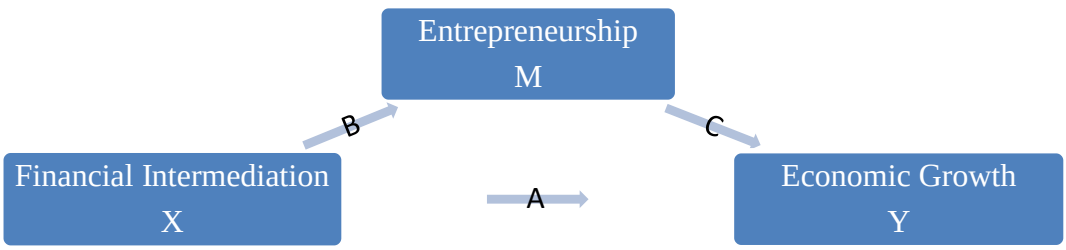

Figure 3.2

The causal relation between financial intermediation, entrepreneurship and economic growth is shown with paths A, B & (B+C). Regression analysis can be done on all the paths as these can be quantified and estimated empirically, as suggested by Hayes & Preacher (2014). Based on the schematic model, it can be concluded that financial intermediation is an independent variable (X), entrepreneurship is a mediating variable (M), and economic growth is a dependent variable (Y).

A change in the independent Variable (X) is presumed to have an impact on the change of the dependent variable (Y). A mediator (M) is that variable which is impacted by the independent variable and in turn impacts the dependent variable. It acts as a conduit for some portion of the causal effect from the independent variable to the dependent variable.

This schematic model provides an explanation for the direct and indirect effects of financial intermediation's impact on economic growth. Structural equation modeling (SEM) is applied for the evaluation of direct and indirect effects. Within the model, path (A) indicates the direct effect of financial intermediation on economic growth. This direct effect encompasses the portion of impact that X has on Y, which is not routed through M. To achieve and isolate this direct effect, the mediator is controlled for statistically. This means accounting for the influence of the mediator in the analysis, allowing observation of the effect of X on Y if the mediator is held constant. It illustrates, while keeping M fixed, how much Y changes for every unit change in X. This is significant because it enables us to comprehend the part of X and Y's interaction that M does not mediate.

This study employs the framework which is in line with the King and Levine(1993b) and Levine and Zervos (1998) and adopts a growth model aligned with Aghion and Howitt (1992) that integrates financial intermediation and entrepreneurship endogenously to analyze the nexus between financial intermediation, entrepreneurship and economic growth. This nexus is presented in the following AK growth model which is a form of Cobb-Douglas production function.

$$Y = AK^{\alpha} L^{1-\alpha} \ldots . (3.1)$$

Where "Y" is economic growth, "A" is total factor productivity, "K" is capital (financial intermediation, public/private investment), "L" is labor (affected by entrepreneurship and human development), "α" is elasticity of output w.r.t capital. The model is extended as follows to integrate financial intermediation, entrepreneurship and other control variables

$$Y = A(FI^{\beta_1} Ent^{\beta_2} X^{\beta} e^{u}) \quad \ldots . (3.2)$$

Where *Y* is economic growth, *FI* is financial intermediation, *Ent* is entrepreneurship, *X* represents control variables like public expenditure, human development and investment etc.

Applying log on Eq. 3.2 results in the following transformed equation Eq. 3.3. This equation represents a general structural formulation and therefore the subscripts *i* and *t* for cross-sectional and time dimensions are not used. The detailed econometric specifications are presented in the subsequent sections, where both time series and panel data models are discussed comprehensively.

$$\ln Y = \ln A + \beta_1 \ln FI + \beta_2 \ln Ent + \beta \ln X + u \quad \ldots . (3.3)$$

The framework assumes that financial intermediation contributes to growth by allocating capital efficiently, lowering transaction costs, and enabling risk diversification, while entrepreneurship serves as a channel for innovation, job creation, and productive investment. These two mechanisms are not treated as static exogenous factors but are instead modeled within a feedback system that captures their dynamic and reciprocal relationship with economic growth. Thus entrepreneurship mediates the relationship between financial intermediation and economic growth. In order to assess this relationship the model is bifurcated into structural equations to be measured simultaneously using structural equation modeling to analyze not only the direct effect of financial intermediation on economic growth, the direct effect of financial intermediation on entrepreneurship as well as the indirect effect of financial intermediation on economic growth through the channel of entrepreneurship i.e. the mediating role of entrepreneurship between financial intermediation and economic growth.

For path (A), the model corresponds to the model of growth proposed by Odedokun (1996) which is a neoclassical production function. The model is specified in the Eq. 3.4 representing economic growth as an output whereas financial intermediation as an input.

$$\ln Y = \delta_0 + \delta_1 \ln FI + \delta \ln X + \varepsilon \ldots . (3.4)$$

This equation assesses the direct impact of financial intermediation on economic growth, controlling for other variables like investment, public expenditure and human development etc.

In the same way Path (B) represents the direct link between financial intermediation and entrepreneurship. Financial intermediation influences entrepreneurial activity by affecting access to credit and investment capital. To assess this path, the model is specified in Eq. 3.5 representing entrepreneurship as a dependent variable and financial intermediation as an independent variable.

$$\ln Ent = \varphi_0 + \varphi_1 \ln FI + \varphi \ln Q + \mu \ldots . (3.5)$$

Where *Ent* is entrepreneurship, *FI* is financial intermediation and *Q* represents control variables like government effectiveness, rule of law, unemployment etc.

However, Path (B + C) represents the financial intermediation's indirect effect on economic growth, which is specified in Eq. 3.3 by introducing (Ent) entrepreneurship as a mediator (M), as successful entrepreneurial ventures can deepen financial markets by increasing demand for financial services and contributing to economic diversification

$$\ln Y = \delta_0 + \delta_1 \ln FI + \delta_1 \ln Ent + \delta \ln X + \varepsilon \ldots . (3.6)$$

Where Y is economic growth, FI is financial intermediation, Ent is entrepreneurship, and X represents a set of control variables.

This indirect effect means that in the first stage, financial intermediation has an effect on entrepreneurship, as shown by path (B), and in the second stage, entrepreneurship has an effect on economic growth, as shown by path (C). To account for this indirect effect, also known as the mediation effect, the independent variable (FI)'s direct effect on the dependent variable (EG) must be significant. When the mediator variable (Ent) is included to the model, the direct effect is diminished because some of the effect passes through the mediator. In this context, the term "partial mediation" refers to the mediation impact that happens when the direct effect gets smaller but still significant, whereas the mediation process is referred to as "complete mediation" when the direct influence has

decreased to the point that it is no longer significant. There is no mediation if the effect of (FI) on (Ent) is insignificant i.e. the coefficient of Path (B) is not significant, or the effect of (Ent) on (EG) is insignificant i.e. the coefficient of Path(C) is not significant, or both the effects are insignificant i.e. coefficients of Path(B) and Path(C) are not significant (Hayes, 2012, 2013). One of the three outcomes that can arise from (M)'s role in mediating the interaction between (X) and (Y) is as follows:

1. M completely mediates the link between X and Y.
2. M has a partially mediating role in the X and Y interaction.
3. M doesn't act as a mediator in the X and Y relationship.

This structural equation modeling incorporates financial intermediation and entrepreneurship as endogenous which is aligned with endogenous growth theory and captures mutual interdependencies, especially the mediating role of entrepreneurship in the relationship between financial intermediation and economic growth.

3.5. Hypotheses

The following hypotheses to be empirically tested for the models have been developed based on the theoretical model, theoretical framework, and the literature. Following the guidelines of Creswell & Creswell (2017) the alternate hypotheses are listed below:

Hypotheses for Global Analysis

H_1 : Financial intermediation positively influences economic growth globally

H_2 : Financial intermediation positively influences entrepreneurship globally

H_3 : Entrepreneurship positively influences economic growth globally

H_4 : Entrepreneurship mediates the relationship of financial intermediation with economic growth globally

Hypotheses for Analysis of Innovation Driven Countries

H_5 : Financial intermediation positively influences growth of innovation driven economies

H_6 : Financial intermediation positively influences entrepreneurship in innovation driven countries

H_7 : Entrepreneurship positively influences growth of innovation driven economies

H_8 : Entrepreneurship mediates the relationship of financial intermediation with growth of innovation driven economies

Hypotheses for Analysis of Efficiency Driven Countries

H_9 : Financial intermediation positively influences growth in efficiency driven economies

H_{10} : Financial intermediation positively influences entrepreneurship in efficiency driven countries

H_{11} : Entrepreneurship positively influences growth of efficiency driven economies

H_{12} : Entrepreneurship mediates the relationship of financial intermediation with growth of efficiency driven economies

Hypotheses for Analysis of Resource Driven Countries

H_{13} : Financial intermediation positively influences growth of resource driven economies

H_{14} : Financial intermediation positively influences entrepreneurship in resource driven countries

H_{15} : Entrepreneurship positively influences growth of resource driven economies

H_{16} : Entrepreneurship mediates the relationship of financial intermediation with growth of resource driven economies

Hypothesis for Analysis of Pakistan

H_{17} : Financial intermediation positively influences growth of Pakistan's economy

H_{18} : Financial intermediation positively influences entrepreneurship in Pakistan

H_{19} : Entrepreneurship positively influences growth of Pakistan's economy

H_{20} : Entrepreneurship mediates the relationship of financial intermediation with growth of Pakistan's economy

3.6. Empirical Specification

The econometric models that are used to analyze panel and time series data are summarized in this section. This study computes two separate sets of statistical measures: panel data for a group of eighty four countries and time series data specifically for Pakistan.

Conducting cross-country analysis utilizing panel data is important because, despite the acknowledged significance of financial intermediation in facilitating entrepreneurial endeavors and promoting economic expansion, there is a limited understanding of how this correlation differs among economies driven by resources, efficiency and innovation. Additionally, it is necessary to provide an understanding of the factors that stimulate growth and innovation. This enables the development of more efficient and focused economic policies and interventions by conducting a comparative comparison among these countries.

All of the countries chosen for the panel study are those that the Global Entrepreneurship Monitor (GEM) has identified. Using the stages outlined by the World Economic Forum (WEF) in its Global Competitiveness Report, the GEM classifies economies based on their level of economic development as factor, efficiency, and innovation-driven countries.

Economies which are driven by resources are classified as the least developed due to their heavy reliance on subsistence agriculture and natural resource extraction, as well as their large dependency on unskilled labor. These economies prioritize fundamental activities and industries in the primary sector, such as agriculture and extraction of natural resources. Economies driven by efficiency have progressed beyond the initial stage and have become more competitive as a result of enhancements in manufacturing processes and product quality. In these economies, emphasis is placed on the industrial and manufacturing sectors, where economic development is driven by efficiency and scale. Economies driven by innovation are the most advanced. At this point, businesses place a premium on innovation and knowledge acquisition. There is profound expansion in the service sector that is highly specialized and relies on professional talent. These economies

devote extensive funds on technology development and high impact value industries, prioritizing R&D activities.

GEM also categorizes economies that are in the process of transition. Economies that are trying to shift from a factor driven stage to an efficiency driven stage are still classified as factor driven by GEM. These economies are improving their manufacturing and product processes, but have not yet reached the level of efficiency driven development. Economies that are trying to shift from being driven by efficiency to being Innovation driven are classified as efficiency driven by GEM. They are enhancing their competiveness by adopting innovations and greater concern for knowledge, although they have yet to fully transition to the stage when innovation will be the foremost driver of success. With regard to diverse nations, these classifications provide a coherent description in a systematic way for understanding the various stages in the economic development. It allows for a more precise analysis of the entrepreneurial activity and economic growth at various levels of development.

The choice to study Pakistan's financial intermediation, entrepreneurship, and economic growth is important because despite an overall increase in deals and investment funds, Pakistan's ranking on the Global Entrepreneurship Development Index (GEDI) is 120 out of 190 countries, which is quite low. According to the International Monetary Fund 2024, Pakistan's economy is the 46th largest in terms of nominal GDP and the 24th largest in terms of GDP using purchasing power parity (PPP). However, despite rise in events, activities, support providers, funders, and businesses, Pakistan's digital entrepreneurship ecosystem has been growing but with a slower pace, according to the 2019 Pakistan Startup Ecosystem Report.

The selection of the 1996–2020 time range is based on the availability of data, as the world governance indicators (WGI) were established in 1996 and the data have been widely accessible since then.

3.6.1. Econometric Model for Panel Data

To fulfill the objectives of the research, the empirical analysis of panel data has been carried out in three stages for a total of eighty four nations during the course of the time period spanning from 1996 to 2020. The direct impact that financial intermediation has on the expansion of the economy is investigated in the first step. In step two, the direct impact that financial intermediaries have on entrepreneurial endeavors is analyzed. In addition, the third step entails examining the financial intermediation's indirect effect on economic growth through the medium of entrepreneurship.

For panel analysis, the econometric model in log form has been developed. Following (Hayes, 2012, 2013) the econometric model is comprised of simultaneous equations to be estimated empirically.

To evaluate the financial intermediation's direct effect on economic growth, the following is the formulation of the econometric model:

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 HD_{it} + \varepsilon_{it} \ldots . (3.7)$$

δ (0,1,2, …) are the coefficients , economic growth (EG) is a dependent variable whereas independent variables include financial intermediation (FI), investment (I), public expenditure (PE) and human development (HD). This selection of variables has been made on the basis of the previous researches that have been done. The error term ε_{it} is predicted to be serially uncorrelated. The orthogonal explanatory variables help to address the issue of any possibility of endogeneity.

To investigate how financial intermediation directly affects entrepreneurship, the following econometric model is used:

$$\ln Ent_{it} = \varphi_0 + \varphi_1 \ln FI_{it} + \varphi_2 \ln UN_{it} + \varphi_3 GE_{it} + \varphi_4 RL_{it} + \mu_{it} \ldots . (3.8)$$

φ (0,1,2, …) are the scalar parameters. The selection of variables is determined by the existing literature, which includes entrepreneurship (Ent) as the dependent variable, and

financial intermediation (FI), unemployment (UN), government effectiveness (GE), and rule of law (RL) as the independent variables. u_{it} is the serially uncorrelated error term. The orthogonal explanatory variables mitigate the possibility of endogeneity.

In the previous chapter, the theoretical framework suggests that entrepreneurship can serve as a pathway for financial intermediation to impact economic growth. To evaluate the indirect influence of financial intermediation on economic growth, the following econometric model has been formulated by the inclusion of the mediator "entrepreneurship" in the model and combining equation 3.7 and 3.8:

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \sigma_1 \ln Ent_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 HD_{it} + \omega_{it} \ldots . (3.9)$$

Where $\delta_{(0,1,2,\ldots)}$ and σ_1 are the scalar parameters, ω_{it} is the serially uncorrelated error term, and orthogonal explanatory variables mitigates the potential issue of endogeneity.

It is necessary for reliable causal conclusions in mediation analysis to assume that the error terms (ε, μ and ω) are uncorrelated (Imai et al., 2010; Bollen & Pearl, 2013). This implies that the stochastic variations in the equations are independent of each other. In addition, the error terms are presumed to follow a multivariate normal distribution. This assumption is important as it forms the basis for the definitions and calculations of direct, indirect, and total impacts inside the model.

It is crucial to realize that the structural equations of the model are interrelated and should be examined as a whole, not as separate and unrelated regression equations that have nothing to do with each other. This simultaneous presumption enables us to accurately capture the linkages and interdependencies among the variables.

The direct effect pertains to the influence of the independent variable (FI), on the dependent variable (EG), when the mediator (Ent) is controlled. This effect quantifies the extent to which the independent variable has a direct impact on the outcome variable, without considering any potential affects that could be conveyed through the mediator. The direct effect of FI on EG is computed by taking the partial derivative of Eq. 3.7 with respect to FI which is as under:

$$\frac{\partial \ln EG}{\partial \ln FI} = \delta_1 \quad \ldots . (3.10)$$

In the same way the direct effect of FI on Ent is calculated by taking the partial derivative of Eq. 3.8 with respect to FI, as shown below:

$$\frac{\partial \ln Ent}{\partial \ln FI} = \varphi_1 \quad \ldots . (3.11)$$

The indirect effect explains how the mediator (Ent), an intermediary variable, mediates the relationship between the independent variable (FI) and the dependent variable (EG). The mediator (Ent) is impacted by the independent variable (FI) in the first stage. The coefficient specifies the amount that a change in the FI is related to a change in the Ent. The dependent variable (EG) is impacted by the mediator (Ent) in the second stage. The coefficient expresses the amount that a change in the mediator is related to a change in the dependent variable. The indirect effect is the combined effect of these two stages and is calculated by multiplying these two coefficients. The Indirect effect of FI on EG through the mediating variable (Ent) is computed using equation (3.8) and (3.9), which is as follows:

$$\frac{\partial \ln EG}{\partial \ln FI} = \frac{\partial \ln EG}{\partial \ln Ent} \times \frac{\partial \ln Ent}{\partial \ln FI} \quad \ldots . (3.12)$$

$$= (\sigma_1 \times \varphi_1) \quad \ldots . (3.13)$$

From equations (3.7 and 3.8), equation (3.9) can be calculated from where the indirect effect of financial intermediation (FI) on economic growth (EG) can be estimated. It is obvious from the right-hand side of the equation (3.9) that, at the first stage, financial intermediation is affecting entrepreneurship and then entrepreneurship is affecting economic growth.

The total effect is the cumulative result of both the direct and indirect impacts of the independent variable on the outcome. In our scenario, the overall impact is determined by

adding together the direct and indirect effects of FI on EG, which are computed using equations (3.10) and (3.13).

$$= \delta_1 + (\sigma_1 \times \varphi_1) \quad \ldots . (3.14)$$

3.6.2. Econometric Model for Pakistan

Analyzing the nexus between Pakistan's financial intermediation, entrepreneurship and economic growth is imperative. Pakistan's position on the Global Entrepreneurship Development Index (GEDI) is rather low, ranking at 120 out of 190 nations, despite an increase in agreements and investment capital. Moreover, despite having a huge population, Pakistan's economy is ranked 46th in terms of nominal GDP and 24th in terms of GDP using purchasing power parity (PPP) in 2024 by the International Monetary Fund (IMF). Whereas, the Pakistan Startup Ecosystem Report 2019 emphasizes the slower expansion of the digital entrepreneurship industry, showcasing a rise in events, support entities, investors, and businesses which is still low.

For time series analysis, specifically for Pakistan, a logarithmic econometric model has been constructed. Following (Hayes, 2012, 2013), the econometric model consists of simultaneous equations that need to be evaluated empirically.

Financial intermediation's direct effect on economic growth is investigated using the econometric model mentioned below:

$$\ln EG_t = \alpha_0 + \alpha_1 \ln FI_t + \alpha_2 \ln I_t + \alpha_3 \ln PE_t + \alpha_4 HD_t + \varepsilon_t \ldots . (3.15)$$

Similarly, the next econometric model is used to investigate how financial intermediation directly affects entrepreneurship.

$$\ln Ent_t = \beta_0 + \beta_1 \ln FI_t + \beta_2 \ln UN_t + \beta_3 GE_t + \beta_4 RL_t + \mu_t \ldots . (3.16)$$

According to the explanation in the preceding chapter, financial intermediation promotes economic growth through the channel of entrepreneurship. Equations 3.15 and 3.16 are

used to create the following econometric model that illustrates the indirect effect of financial intermediation on economic growth when the mediator "entrepreneurship" enters the model.

$$\ln EG_t = \alpha_0 + \alpha_1 \ln FI_t + \gamma_1 \ln Ent_t + \alpha_2 \ln I_t + \alpha_3 \ln PE_t + \alpha_4 HD_t + \omega_t \ldots . (3.17)$$

α (0,1,2, …), β (0,1,2, …) and γ in equation 3.15, 3.16, and 3.17 are the coefficients of each equation in model. Variables of Eq. 3.12 include economic growth (EG) as a dependent variable whereas independent variables include financial intermediation (FI), investment (I), public expenditure (PE) and human development (HD). In Eq. 3.16, entrepreneurship (Ent) is a dependent variable whereas independent variables are financial intermediation (FI), unemployment (UN), government effectiveness (GE), and rule of law (RL). Eq. 3.17 is to estimate the impact of Entrepreneurship (Ent) as a mediator in association of Financial Intermediation (FI) with Economic growth (EG). ε, μ and ω represent the error terms in the equations.

In order to draw valid causal findings in mediation analysis, it is essential to assume that the error components (ε, μ and ω) are uncorrelated, as stated by Imai et al. (2010) and Bollen and Pearl (2013). From this, it can be determined that the random fluctuations present in the equations do not have independent influence on one another. In addition, the error terms are assumed to follow a multivariate normal distribution. This assumption is critical because it underlies the model's definitions and calculations of direct, indirect, and total impacts. Along with this, it should be understood that the structural equations of the model are dependent and must be analyzed as a whole rather than as separate regression equations each independently influencing the other. This simultaneous presumption helps to achieve the correct estimation of the associations and causal relationships within the variables.

With the mediator (Ent) held constant, the direct effect is described as the influence of the independent variable (FI) on the variable (EG). In other terms, it measures the independent variable's "direct" effect on the outcome variable, eliminating possible impacts channeled through the mediator. The direct effect of FI on EG is calculated by taking the partial derivative of Eq. 3.15 with respect to FI which is as under:

$$\frac{\partial \ln EG}{\partial \ln FI} = \alpha_1 \quad \ldots . (3.18)$$

In the same way the direct effect of FI on Ent is computed by calculating the partial derivative of Eq. 3.16 with respect to FI which is as under:

$$\frac{\partial \ln Ent}{\partial \ln FI} = \beta_1 \quad \ldots . (3.19)$$

The indirect effect explains how the mediator (Ent), an intermediary variable, mediates the relationship between the independent variable (FI) and the dependent variable (EG). This indicates that the mediator has a role in either entirely or partially transmitting the influence of the independent variable on the dependent variable. The mediator (Ent) is impacted by the independent variable (FI) in the first stage, whereas, The dependent variable (EG) is impacted by the mediator (Ent) in the second stage. The indirect effect is the combined effect of these two stages and is calculated by multiplying these two coefficients.

The Indirect effect of FI on EG through the mediating variable (Ent) is computed using equations (3.16) and (3.17), which is as follows:

$$\frac{\partial \ln EG}{\partial \ln FI} = \frac{\partial \ln EG}{\partial \ln Ent} \times \frac{\partial \ln Ent}{\partial \ln FI} \quad \ldots . (3.20)$$

$$= (\gamma_1 \times \beta_1) \quad \ldots . (3.21)$$

From Eq. (3.15 and 3.16), Eq. 3.17 can be calculated to estimate the financial intermediation's indirect effect on economic growth. The right side of the Eq. 3.17 makes it clear that financial intermediation influences entrepreneurship initially, and entrepreneurship thereafter influences economic growth.

The sum of the direct and indirect effects that the independent variable has on the dependent variable is known as the total effect. In our scenario, the overall impact is

determined by adding together the direct and indirect effects of FI on EG, which are computed using equations (3.18) and (3.21).

$$= \alpha_1 + (\gamma_1 \times \beta_1) \quad \ldots . (3.22)$$

3.7. Data Sources

This study investigates the mediating role of entrepreneurship in the association between financial intermediation and economic growth by using data spanning from 1996 to 2020 pertaining to eighty four countries. Based on the data availability and existing literature, economic growth, financial intermediation, investment, public expenditure, human development, entrepreneurship, unemployment, government effectiveness, and rule of law are the variables used in this study. The World Development Indicators (WDI) provides World Bank's published data on economic growth, financial intermediation, investment, public expenditure, and human development. The International Labour Organization (ILO) provides data on entrepreneurship and unemployment, while government effectiveness and rule of law are retrieved from the World Governance Indicators (WGI) which was developed in 1994 and the data became accessible from 1996. Thus, this research relies on secondary data collected from global publicly available databases. The sample includes countries for which complete data are available for the variables of interest. The sample selection is based on purposive (or criterion-based) sampling, where countries with sufficient and consistent data for the required variables are included. Thus, the sampling reflects a data-driven inclusion criterion rather than random selection. The comprehensive explanation of these variables and the process of constructing them is given below.

3.8. Variables' Description

This section offers a concise and comprehensive explanation of the variables employed in the study. It discusses the reasoning behind the choice of these variables and provides a summary of the procedures employed to generate them. The table below provides a brief

overview of each variable, followed by a more detailed explanation of their definitions, purposes, and construction techniques.

Table 3.1: Description of Variables

Symbol	Variable	Data/Proxy	Source
EG	Economic growth	Real GDP (constant 2015 US$)	WDI
FI	Financial Intermediation	Domestic credit to private sector as a percentage of GDP	WDI
I	Investment	Gross fixed capital formation	WDI
PE	Public Expenditure	General government final consumption expenditure as a percentage of GDP	WDI
HD	Human Development	Human Development Index	WDI
EN	Entrepreneurship	Self-Employment as a percentage of Total Employment	ILO
UN	Unemployment	Unemployment as a percentage of Total Labor Force	ILO
GE	Government Effectiveness	Index of Government Effectiveness	WGI
RL	Rule of Law	Index of Rule of Law	WGI

The detailed description of the variables involves a comprehensive examination of their significance, the methods used to measure them, and pertinent theoretical or empirical foundation that supports the inclusion of these variables within the study's framework.

3.8.1. Economic Growth

Economic growth is a dependent variable in our first and third model for which real GDP constant 2015 US$ is used. As it captures the value of all goods and services produced within an economy and factors inflation out, real GDP is often regarded as a good proxy for growth of the economy. This measure is popular for numerous reasons. First, it includes total economic output which consists of consumption, investment spending, government spending, and net exports to demonstrate the health and size of economy (Mankiw, 2020). Real GDP also resolves issues with price changes providing realistic long term comparisons and ensuring growth rates are a measure of increases in output

rather than inflation (Feldstein, 2017). This indicator is so trusted that economists and policy-makers put it to use for cross country analysis and evaluation of economic policies which makes it indispensable in economic modeling and empirical studies (Samuelson & Nordhaus, 2010). Real GDP provides a strong approximation of the economic linkages which Barro (1991) and Sala-i-Martin (1997) demonstrate in their studies. Therefore, this study also relies on real GDP to measure economic growth and employs the logarithm for conducting the analysis. Since, the utilization of logs is helpful to stabilize the variation in the data in econometric modeling.

3.8.2. Financial Intermediation

Financial intermediation has received attention from scholars in relation to the various aspects of the financial system and its productivity. For example, the ratio of M2 to GDP reflects how well the banks are able to mobilize resources for investment (Qamruzzaman & Jianguo, 2017; Bara & Mudzingiri, 2016; Ansong et al., 2011). Another measure computes the ratio of credit to private entities by financial institutions to the GDP (Levine, 1997; Shittu, 2012; Michalopoulos et al., 2009). The percentage of credit by banks to the private sector in relation to GDP is also another measure used for financial intermediation (Levine et al., 2000). The ratio of banking sector assets to GDP is another approach to assess the size of the banking sector in relation to the GDP (Beck et al., 2016). On the other hand, the interest rate spread as a measure defines the difference between the costs associated with borrowing and the benefits associated with saving and this measures the effectiveness of financial intermediation (Demirguc-Kunt & Huizinga, 1999). Liquidity Liabilities to GDP is another measurement which defines and quantifies the short-term liabilities of a financial institution like demand deposits as a percentage of the economy and the extent to which the economy is monetized and the level of available financial resources (King & Levine, 1993). The quantity of ATMs per Capita and bank branches is also a method used to gauge the level of accessibility of banking services to the population (Claessens & Laeven, 2005). Stock Market Capitalization to GDP is also utilized to evaluate the proportion of the stock market's size in relation to the economy that indicates the degree to which equity financing is employed in financial intermediation (Levine & Zervos, 1998).

Each indicator captures distinct characteristics of financial intermediation, and their significance varies depending on the study objectives. Determining the appropriate indicator for financial intermediation relies on the specific context and the particular aspects of financial intermediation one intends to measure. Private sector credit-to-GDP ratio reflects the level of financial intermediation, indicating how much money is being directed by financial institutions towards the private sector. Consequently, this represents an increase in financial depth because it assesses the financial options that are available to businesses, particularly new businesses (Jalil et al., 2010; Wolde-Rufael, 2009). This study also uses this proxy for financial intermediation because it seems to be closely associated with growth of the economy. Levine (1997) and Beck et al. (2000) have found that private sector credit is a reliable indicator of the development of the financial sector. The proportion of domestic credit is multiplied by the real GDP to get the absolute value of domestic credit that financial institutions have extended to the private sector. After calculating the absolute values, logarithmic transformation is applied to normalize the data. This is advantageous since using logarithms helps to reduce the variability in the data, making it more suitable for econometric analysis. Numerous scholarly works, such as those conducted by Beck et al. (2004) and Ang (2008), have demonstrated the positive influence of financial intermediation on economic growth. Likewise, this study also predicts that financial intermediation and economic growth are positively correlated.

3.8.3. Investment

Gross fixed capital formation (GFCF) signifies the total expenditure on newly acquired or existing fixed assets by households, governments, and enterprises, offset against the cost of fixed assets which have been disposed of. It is one of the most important drivers of economic growth, indicating the contraction or expansion in the physical capital and fixed assets of an economy. This indicator encompasses capital investments like infrastructure, new machinery and equipment, as well as new buildings which create further capital which will enable greater future output. There is a number of studies that support the use of GFCF as a proxy for investment e.g. Kong et al. (2020) and Trpeski and Cvetanoska (2019). Solow (1956) claimed that the investment in physical capital is vital for any economy and GFCF provides a quantifiable measure of such investment. Barro (1991), Levine and Renelt (1992), and Ghali and Ahmed (1999) focused on the importance of

GFCF in measuring capital accumulation and its impact on economic advancement. Moreover, both the World Bank and the IMF often use GFCF in their evaluations and publications as a measurement of investment in various economies, which demonstrates its pervasive relevance and utility (World Bank, 2020; IMF, 2020). Therefore, GFCF is substantiated as a measurement of investment and is rather useful providing substantial information concerning the economy and its possible growth (Jones, 2016). In the same manner, this study uses GFCF as a proxy for investment and transforms the data by applying logarithms to reduce variability, thus increasing suitability for econometric analysis. This study also anticipates a positive investment and economic growth relationship as assumed in earlier studies.

3.8.4. Public Expenditure

Public expenditure refers to the amount of money a government allocates to social programs, construction of infrastructure, healthcare, education, and other services in a bid to foster economic growth and enhance the welfare of its citizens. Keynes theorized that public spending could increase demand and revitalize the economy during periods of recession by employing idled resources and reducing unemployment (1936). Barro (1990) emphasized public spending on infrastructure, particularly in education and healthcare, stating that these sectors are critical for developing human capital and fostering productivity, thereby sustaining long-term economic expansion. Enhanced access to education raises skill levels among members of the workforce, driving improvements in creativity and productivity.More recently, studies show public spending tends to stimulate economic growth by increasing innovation and productivity. In addition, over the past few years, research has suggested public spending does promotes economic growth due to the increase in innovation and productivity. In their paper, Gemmell et al. (2016) argue that spending of a non-productive nature may negatively impact long-term growth. In contrast, spending on infrastructure and education is beneficial to long-term economic growth. Still, the outcomes of public spending bear a striking dependence on how well the expenditure achieves its predefined goals. This suggests that public spending and economic growth can be positively or negatively correlated, depending on how the spending is executed and its effectiveness.

3.8.5. Human Development

For human development, many researchers argued Human Development Index (HDI) to be used as an indicator of human development e.g. Fatah et al. (2012), Grubaugh (2015) and Suri et al. (2011). Furthermore, Kwon (2009) claims that International Labour Organisation (ILO) and United Nations Development Programme (UNDP) also regard HDI as a more appropriate measure for human development. Distinguished economists, including Amartya Sen, who was instrumental in the creation of the HDI, argue that human development goes beyond the mere accumulation of wealth. This broader perspective should consider factors such as individuals' overall well-being and capabilities (Sen, 2000). Mahbub ul Haq, the other co-founder of HDI, had the belief that development should prioritize the expansion of options and freedoms rather than solely emphasizing economic progress (Haq, 1995). Acquiring a broader viewpoint enables one to understand and effectively handle all aspects of human development (Stiglitz et al., 2009). This index constitutes standard of living, knowledge and health along with many sub variables; which include reading and writing proficiency, mortality rate and educational participation etc. Therefore, the HDI is also utilized in this study as a measure of human development, and a favorable correlation between economic growth and human development is anticipated.

3.8.6. Entrepreneurship

The dependent variable in the second model is entrepreneurship. It serves as a mediator variable in this research as well. Considering the intricate conception of entrepreneurship and the lack of a precise indicator to measure it (Ahmad & Seymour, 2008), self-employment can be served as a practical indicator for empirical studies on entrepreneurship (Bjuggren et al., 2012). For longitudinal studies, self-employment as a share of total employment is viewed as a dependable proxy for entrepreneurship. This is the case because it clearly shows the number of people who are actually engaged in entrepreneurial efforts by starting and running their own businesses through self-employment. As such, it is deemed a more direct proxy than other measures such as patent applications or firm formation rates which are often seen as proxy indicators of entrepreneurship (Audretsch & Thurik, 2001; Parker, 2004). Alternative proxies of entrepreneurship may face problems of inconsistent descriptions or methodologies of

gathering information, presenting problems for cross country or temporal comparisons (Parker, 2004; Blanchflower, 2000). Other proxies used to measure entrepreneurship include the counting of new business registrations or the rate at which gazelles are started within a given interval. This proxy can provide useful information about the entrepreneurial dynamism of an economy; however, it might ignore some informal or small scale entrepreneurial activities (Reynolds et al., 2005). Another indicator is the number of applications for patents, which could serve as a proxy for innovation and entrepreneurship in heavily technology dependent industries. Nevertheless, this measure might be unable to capture extensive entrepreneurial endeavors in industries that are not heavily reliant on technology (Acs et al., 2009). Venture capital investments can also serve as a proxy for financial backing of new and rapidly growing enterprises. However, this measure is typically inclined towards certain sectors and areas (Lerner, 2000).

Apparently, self-employment data are readily accessible and regularly gathered across countries and time periods, making it well-suited for panel data and time series research. In addition, self-employment estimates extend to individuals in the informal sector as well, who may not be accounted for in official and formal records of business registration. This is especially pertinent in developing nations because a substantial proportion of entrepreneurial endeavors take place outside the confines of the formal economy (Williams & Round, 2009; La Porta & Shleifer, 2014).

The choice to pursue self-employment frequently signifies an individual's inclination towards entrepreneurship and their readiness to undertake risks. The decision to engage in self-employment can be viewed as a core aspect of entrepreneurship, reflecting the fundamental principles of entrepreneurial activity (Blanchflower, 2000). Moreover, the rates of individuals working for themselves have the ability to adjust to varying economic situations, delivering valuable information on the variations in entrepreneurial activities in response to economic cycles. In times of economic recession, individuals may opt for self-employment instead of working for a fixed pay or wage employment (Fairlie, 2013; Parker, 2009).

Given that several persons who work for themselves usually operate and manage small businesses, the rates of self-employment can be used as an indicator of small business operations, which are a vital aspect of entrepreneurship. These small businesses are the

accelerators and serve as the main catalysts for innovation, employment generation, and economic expansion (Acs & Audretsch, 1988; Carree & Thurik, 2010). Moreover, Self-employment as a proxy of entrepreneurship is consistent with studies suggesting that identifying an entrepreneur through self-employment relies on defining entrepreneurship as the willingness to take risks. Entrepreneurs, unlike salaried employees, assume economic risks in exchange for profits which are usually uncertain (Gaweł, 2010). Thus, in this study, self-employment is being utilized as a substitute for entrepreneurship, as suggested by Salgado-Banda (2007). To assess the entrepreneurship, this study collected three data sets from modeled ILO estimates (i) Self-employment as a percentage of total employment, (ii) Total labor force and (iii) Unemployment as a percentage of total labor force. In the first step, unemployment percentage is multiplied by the total labor force to obtain the total figure of unemployment. In the second phase, after acquiring the unemployment statistics, they are deducted from the total labor force in order to determine the total employment. In the third phase, the self-employment percentage is multiplied by the total employment to obtain the absolute numbers of self-employed individuals. Finally, the self-employment data are logged to standardize the data and minimize any variations in the data for robust econometric outcome.

3.8.7. Unemployment

The labor force that is unemployed but looking for work is referred to as unemployed. According to Faria et al. (2009), there is a dynamic relationship between unemployment and entrepreneurship. Since the opportunity cost of entrepreneurship is lower for the unemployed, unemployment may increase startup activity. On the one hand, hiring people by startups may result in a probable decline in unemployment. The relationship between unemployment and entrepreneurship has been extensively studied in the literature, with examples including Oxenfeldt (1943), Blau (1987), Evans & Jovanovic (1989), Evans & Leighton (1990), Blanchflower & Meyer (1994), Pfeiffer & Reize (2000), Audretsch et al. (2001), etc. This study also suggests a positive correlation between entrepreneurship and unemployment based on earlier research. With regard to the variable of unemployment, this study gathers information on the total labor force as well as the data regarding unemployment as a percentage of total labor from modeled ILO estimates. Then, in order to acquire the absolute figure of unemployment, the unemployment percentage is

multiplied by the total labor force. After that, the log of unemployment is undertaken to standardize the data and reduce any changes in the data in order to achieve a robust econometric outcome.

3.8.8. Government Effectiveness

The World Bank developed an index to measure government effectiveness. It is based on the perceptions regarding caliber of the civil and public service, the execution and formulation of policies, the government's degree of objectivity when facing political pressure, and the government's standing for its adherence to these policies (Duho et al., 2020). Numerous studies (Friedman, 2011; Obaji & Olugu, 2014; Rodriguez-Gulias et al., 2018; Ajide, 2022) as mentioned have highlighted the profound relationship which exists between government effectiveness and entrepreneurship. High scores on this index suggest that a government is functioning properly.Such a government can profoundly positively impact entrepreneurship by fostering trust in the government's public sector and its policies, its efficiency, and its reliability in providing public services. Therefore, it settles a delightful situation for entrepreneurs to start and grow their businesses. As an illustration, Djankov et al. (2006) found that strong regulatory frameworks together with government efficiency strongly support new venture creation and significantly reduce the costs of doing business. On the contrary, low government efficacy tends to worsen entrepreneurial activity by accruing operational inefficiencies, increasing bureaucratic red tape, along with adding policy implementation risks laden with uncertainty. This is the argument as advanced by Baumol et al. (2011), which exposes the fact that poor government performance stifles innovation and business expansion, where in effect, worse off entrepreneurs face high transaction costs, accompanied by unpredictable, shifting rules that add to risk.. Therefore, the government's efficiency is essential for the success of entrepreneurs and the economy's wellbeing.

3.8.9. Rule of Law

Rule of Law Index developed by the World Bank captures the population's views on their trust regarding rules and compliance with laws concerning the control of property rights, contract enforcement, functioning of police and judiciary, and crime and violence

(Kaufmann et al., 2011). Indicators such as rule of law are considered to be drivers of entrepreneurial activity (Levie & Autio, 2011; Agostino et al., 2020). Many researchers have studied the impact of rule of law on entrepreneurship (Goltz et al., 2015; Salinas et al., 2019; Elert et al., 2019), and all have reached the same conclusion: the impact is positive. Nevertheless, it is emphasized that the score of Rule of Law, as an index, can dramatically influence entrepreneurship, both positively and negatively. The effectiveness of a nation's rule of law, specifically strong enforcement of property rights, effective contract execution, and efficient legal frameworks, creates positive conditions for entrepreneurial activities. It provides entrepreneurs the confidence that their investments and innovations will be protected which encourages business creation and growth. Klapper et al. (2006) noted that there is an association of well-established legal frameworks with higher rates of business formation and lower suppression of entrepreneurial activity. On the other hand, the lack of well-defined legal frameworks suffering from corruption and weak judicial bodies with uneven enforcement of contracts discourage entrepreneurial activity. Such environments pose great risks and uncertainties for resource allocation, which makes investment in such economies unappealing. This is also supported by Acemoglu and Johnson (2005) stating that weak legal institutional systems retards economic growth and entrepreneurial activity because they create an unpredictable business environment. Thus, the entrepreneurial climate of a country is largely determined by the Rule of Law.

3.9. Estimation Methodology

This section focuses on estimation techniques employed for both panel and time series data analysis. Appropriate econometric methods have been outlined and explained to address the possible econometric concerns. The period of study is between 1996 and 2020 for Pakistan and a panel of eighty four countries comprised of resource, efficiency, and innovation driven economies.

3.9.1. Estimation Specification for Panel Data

This research uses panel data to examine cross-country differences and to measure the effects of changes in independent variables over time. In this case, the panel dataset is

unbalanced because some data points are missing for certain years or countries. Nevertheless, the study applies appropriate methodologies of panel data estimation i.e. Fixed Effects (FE), Random Effects (RE), and Generalized Method of Moments (GMM), all of which are used for unbalanced panels as well. Also, to improve the distributional properties of the data and heteroscedasticity, the study applies the natural logarithm transformation to the relevant variables, except for indices which are kept in original scale. This study conducts statistical analysis using E-Views and Stata. E-Views is used for estimating Pooled Ordinary Least Squares (POLS), Fixed Effects (FE), Random Effects (RE), and Generalized Method of Moments (GMM) models because of its strong capabilities in various panel data estimation methods. Stata is used for Structural Equation Modeling (SEM) due to its sophistication in estimating and assessing relationships among latent and observed variables. The rigorous empirical analysis incorporating all elements makes use of software tools to achieve a more thorough analysis. Gathering data in panels improves the number of observations which increases the degrees of freedom. This potentially leads to meaningful conclusions as noted by Raj and Baltagi (2012). Moreover, panel datasets lead to more precise estimates and allow researchers to tackle heterogeneities in diverse time periods and across different sections. Furthermore, Hsiao (2022) explains other advantages such as the mitigation of unaccounted factors and the analysis of systems with dynamic interactions.

This study employs structural equation modeling (SEM) to assess the direct and indirect impacts of financial intermediation on economic growth. In this case, entrepreneurship is analyzed as a mediating variable between the two phenomena. Also, to address the econometric concerns regarding the validity and accuracy of the results from SEM, the study applies standard panel methods POLS, FE, RE, and GMM. The detailed methodology is provided in the following section.

3.9.1.1. Pooled OLS, Fixed Effect and Random Effect

To handle panel data properly, a variety of estimating methodologies have been thoroughly studied in the literature. When working with panel data, if there are no cross-sectional or time-specific effects, efficient and unbiased estimates of the parameters can be obtained by using ordinary least squares. Despite the seeming unreasonable nature of

this assumption, this study utilizes the estimates of Pooled OLS as a benchmark to examine the financial intermediation's direct impact on both the economic growth and entrepreneurship. However, if these specific impacts (either cross-sectional or temporal) are present, the econometric problems like endogeneity, heteroscedasticity, and autocorrelation may arise. In order to address these issues, advanced versions such as fixed effect, random effect and generalized method of moments are employed (Asteriou & Hall, 2007; Greene, 2003) to analyze the dataset consisting of eighty four nations (Appendix-A) for the time period 1996-2020. These methods consider the country-specific impacts that are significant when analyzing panel data of economies driven by factors/resources, efficiency, and innovation. This is particularly relevant when comparing the growth rates of different countries, with some expanding faster than others.

The fixed effect model includes intercepts that are specific to each country and time period. This model with country-specific intercept is employed to account for unobserved heterogeneity, assuming that the heterogeneity is constant across time and is correlated with the regressors. The degree of heterogeneity is expected to be constant across several cross-sections in a FE model with a time-specific intercept. The fixed effect model is used to detect and track hidden variations and heterogeneity that remain consistent across time. The first difference is taken to eliminate the constant component. It is assumed that the unique outcomes are correlated with the exogenous variables.

An alternate approach for assessing panel data is the random effect model, which assumes the absence of any idiosyncratic effect. This methodology also helps to track overlooked variations that remain constant over time and are linked to external factors. The constant can be factored out by calculating the first derivative. According to the random effects assumptions, individual specific characteristics are unrelated to the regression model and there is no correlation between the cross-section or time-specific effects and the explanatory variables. The parameter estimates from the random-effects model are more efficient than those from the fixed-effects model, assuming the random effects assumption holds true.

The presence of endogeneity in variables caused by cross-country dependency and uncontrolled heterogeneity leads to biased estimates of parameters in the FE and RE models. Therefore, it may be necessary to shift the estimation towards the instrumental

variable based technique known as generalized method of moments (GMM). The number of time series (t) must be less than the number of cross sections (n) in order to employ the GMM. In this study, the available data includes a total of twenty five time series (t=25) and eighty-four cross-sections (n=eighty four).

3.9.1.2. Generalized Method of Moments (Two Step System GMM)

In order to conduct a more thorough analysis, it is necessary to take into consideration the possibility of endogeneity and reverse causality that may exist between the variables. The variable of financial intermediation is endogenous in both the economic growth model and the entrepreneurship model; the issue of endogeneity may arise when control variables are also taken into account. The GMM is the most suitable technique to tackle this issue of endogeneity (Arellano & Bover, 1995; Caselli et al., 1996; Blundell & Bond, 1998; Bond et al., 2001) due to the following reasons: (i) The model does not require the condition of homoscedasticity. (ii) The model takes into account moment requirements and assumes zero correlation between lagged regressors and the error term. (iii) Consider the temporal patterns, interdependence across different entities, and the influence of lagged values when analyzing explanatory factors in models. (iv) Treat practically all explanatory variables as endogenous variables. Therefore this study also used GMM to tackle the issue of endogenity and to get more robust results.

When it comes to our first model, the GMM approach is stated by beginning with the cross section equation, which is given as follows:

$$\ln EG_i = \delta_0 + \delta_1 \ln FI_i + \delta_2 \ln I_i + \delta_3 \ln PE_i + \delta_4 \ln HD_i + \varepsilon_i \ \ldots . (3.23)$$

This specification does not include the specific effects of cross-sections, which can lead to omitted variables biasedness. The condition of stringent exogeneity is a prerequisite that is entirely violated. The GMM is the ideal approach for effectively addressing time-varying effects and the endogeneity problem, as demonstrated by Bond et al. (2001). Therefore, panel model specification is formulated as follows:

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 \ln HD_{it} + \varepsilon_{it} \ldots . (3.24)$$

In the equation shown above, the subscript also denotes the time dimension of the variables. To take into consideration the effects that remain constant throughout time, the error term is distributed as follows:

$$v_{it} = \delta_i + \varepsilon_{it} \ldots . (3.25)$$

The error term specification above indicates that δ_i represents the error term's time-invariant components, while ε_{it} represents the time-varying properties of the error term component. The panel model is further transformed and takes the following form:

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 \ln HD_{it} + \delta_i + \varepsilon_{it} \ldots . (3.26)$$

Further, it is possible to write it as

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 \ln HD_{it} + v_{it} \ldots . (3.27)$$

The first difference can be taken to address the omitted variables biasedness.

$$\Delta \ln EG_{it} = \delta_0 + \delta_1 \Delta \ln FI_{it} + \delta_2 \Delta \ln I_{it} + \delta_3 \Delta \ln PE_{it} + \delta_4 \Delta \ln HD_{it} + \Delta v_{it} \ldots . (3.28)$$

In the above equation $\delta_{it} - \delta_{it-1} = 0$ is the condition which must be satisfied. However, the issue of endogeneity, on the other hand, arises between v_{it-1} and $\ln EG_{it-1}$. According to the equation shown above, there is no distinction between the relationships of $\ln EG_{it-1}$ and v_{it-1}; nonetheless, $\Delta \ln EG_{it}$ is the lagged variable that is being indicated here. Thus, the model can be expressed in the following manner.

$$\text{If } \ln EG_{it} = f(v_{it}) \Rightarrow \ln EG_{it-1} = f(v_{it-1}) \ldots . (3.29)$$

Therefore, the OLS approach generates biased results, but the insertion of instrumental variables is necessary for accurate estimation. Anderson & Hsiao (1981) emphasize that $\Delta \ln EG_{it-1}$ is a suitable instrument, and later on, $\ln EG_{it-2}$ is deemed the most appropriate

instrumental variable. The authors suggest a matrix of variables $M = [\ln EG_{it-2}, \Delta Z_{it}]$ and acknowledge that ΔZ_{it} is influenced by exogenous variables. In addition, Arellano and Bond (1991) suggested the introduction of additional instrumental variables, such as $\ln EG_{it-2}, \ln EG_{it-3}, \ldots$ and so on. The subsequent moment constraints are utilized:

$$E(\ln EG_{it-k}, \Delta v_{it}) = 0 \text{ and for } k = 2,3,\ldots,(t-1)\ldots \quad \ldots . (3.30)$$

Whereas

$$(Z_{it-n}, \Delta v_{it}) = 0 \text{ and for } n = 1,2,3,\ldots,(t-1)\ldots \quad \ldots . (3.31)$$

The aforementioned two models emphasize that the instruments used in the model may be more than the number of variables ad GMM effectively combines instruments (Arellano and Bond, 1991). As Arellano and Bover (1995) and Blundell and Bond (1998) have indicated, the model makes no assumptions about the moments condition limitations. The vector form of each instrumental variable can be expressed as follows in the first stage, using the methods described in Arellano & Bond (1991).

$$N^* = [\ln EG_{it-2}, \ln EG, \ldots, \Delta v_t, \Delta v_{it-1}, \Delta v_{it-2}, \ldots] \ldots . (3.32)$$

The second step involves representing the inverse form of the variance-covariance matrix, and expressing the GMM estimators accordingly as shown below:

$$\hat{\Omega}_{GMM} = (Z' N^* D_H N^* Z')^{-1} Z' N^* D_H N^* \ln EG' \ldots . (3.33)$$

The GMM estimators obtained through the two-step Arellano & Bond (1991) method are not only more efficient but also suggest the most suitable instruments for endogenous variables. Therefore, the system GMM method is considered the most suitable approach for addressing the presence of endogeneity in the analysis.

For the second model, that is to analyze the specific effects of financial intermediation on entrepreneurship, this study utilizes the GMM, beginning with the cross-sectional equation provided as:

$$\ln Ent_t = \varphi_0 + \varphi_1 \ln FI_t + \varphi_2 \ln UN_i + \varphi_3 GE_i + \varphi_4 RL_i + \mu_i \ldots . (3.34)$$

This specification fails to account for the cross-sectional specific effect, leading to biases resulting from omitted variables. The prerequisite of strict exogeneity for the independent variables is entirely compromised. At this point, the panel model specification can be formulated as follows:

$$\ln Ent_{it} = \varphi_0 + \varphi_1 \ln FI_{it} + \varphi_2 \ln UN_{it} + \varphi_3 GE_{it} + \varphi_4 RL_{it} + \mu_{it} \ldots . (3.35)$$

The subscript in the equation refers to the time dimension of variables mentioned above. In order to account for the constant effects over time, the error term is distributed according to the following formula:

$$\eta_{it} = \varphi_i + \mu_{it} \ldots . (3.36)$$

In the error term specification above, φ_i represents the constant elements of the error term, while μ_{it} solely signifies the changing aspects of the error term component over time. The panel model can be represented in the following form:

$$\ln Ent_{it} = \varphi_0 + \varphi_1 \ln FI_{it} + \varphi_2 \ln UN_{it} + \varphi_3 GE_{it} + \varphi_4 RL_{it} + \varphi_i + \mu_{it} \ldots . (3.37)$$

It can also be expressed as

$$\ln Ent_{it} = \varphi_0 + \varphi_1 \ln FI_{it} + \varphi_2 \ln UN_{it} + \varphi_3 GE_{it} + \varphi_4 RL_{it} + \eta_{it} \ldots . (3.38)$$

The first difference can be applied to both sides of the model to address the omitted variable biases.

$$\Delta \ln Ent_{it} = \varphi_0 + \varphi_1 \Delta \ln FI_{it} + \varphi_2 \Delta \ln UN_{it} + \varphi_3 \Delta GE_{it} + \varphi_4 \Delta RL_{it} + \Delta \eta_{it} \ldots . (3.39)$$

This equation includes a condition $\varphi_{it} - \varphi_{it-1} = 0$, that needs to be met. On the contrary, the problem of endogeneity may occur between η_{it-1} and the lagged dependent variable $\Delta \ln Ent_{it}$. As per the equation presented above, the relationship between $\ln Ent_{it-1}$ and η_{it-1} are treated equally. The specific variable being highlighted in this context is $\Delta \ln Ent_{it}$. Thus, the model can be articulated in the following way.

$$\text{If } \ln Ent_{it} = f(\eta_{it}) \Rightarrow \ln Ent_{it-1} = f(\eta_{it-1}) \ldots . (3.40)$$

Therefore, when using the OLS method, it is likely to obtain biased estimates. To address this issue, it is necessary to incorporate instrumental variables. Anderson and Hsiao (1981) emphasize that $\Delta \ln Ent_{it-1}$ is a suitable instrument, with $\ln Ent_{it-2}$ later being considered the most appropriate instrumental variable in the study. The suggestion is to create a matrix of variables denoted as $M = [\ln Ent_{it-2}, \Delta X_{it}]$ and to recognize that ΔX_{it} is influenced by external factors. Additionally, they suggested to incorporate more instrumental variables, such as $\ln Ent_{it-2}, \ln Ent_{it-3}, \ldots$, into the analysis, as proposed by Arellano and Bond in 1991. Hence, the moment conditions are illustrated as:

$$E(\ln Ent_{it-k}, \Delta \eta_{it}) = 0 \text{ and for } k = 2,3,\ldots,(t-1)\ldots \quad \ldots . (3.41)$$

Whereas

$$(X_{it-n}, \Delta \eta_{it}) = 0 \text{ and for } n = 1,2,3,\ldots,(t-1)\ldots \quad \ldots . (3.42)$$

Therefore, the number of instruments used in the model may be more than the number of variables. A two-step method introduced by Arellano & Bond (1991) introduced can effectively combine instruments with the GMM method for improved results. It is commonly believed that there are no restrictions in the model when it comes to the moments condition (Arellano & Bover, 1995; Blundell & Bond, 1998). According to the methodology outlined by Arellano & Bond (1991), in the first step the vector form of instrumental variables is illustrated as:

$$K^{*} = [\ln Ent_{it-2}, \ln Ent, ..., \Delta\eta_{t}, \Delta\eta_{it-1}, \Delta\eta_{it-2}, ...] \ldots . (3.43)$$

In the second step, the inverse form of the variance-covariance matrix is obtained, and the equation for Q_H and GMM estimators is formulated as follows:

$$\hat{\Omega}_{GMM} = (X'K^{*}Q_{H}K^{*}X')^{-1}X'K^{*}Q_{H}K^{*}\ln Ent' \ldots . (3.44)$$

According to Arellano & Bond (1991), the GMM estimators derived from a two-step process are not only more efficient, but they also offer suitable instruments for addressing endogeneity in variables within the model. Therefore, the system GMM approach is the most suitable technique for addressing endogeneity issues related to variables within a model.

3.9.1.3. Structural Equation Modeling for testing Mediation

In the age of modern technology, a substantial volume of data pertaining to many fields are collected and proficiently conveyed globally. Therefore, it is imperative to utilize sophisticated research methodologies in data analysis in order to make it meaningful for decision makers, policy makers, and similar individuals. Structural Equation Modeling (SEM) is considered a good methodology for analyzing multivariate data with the ability to addresses the limitations of the prior methodology, Ordinary Least Square (OLS) regressions (Akinyode, 2016). This second generation method has the capability of simultaneously including many indicators and the usual observed variables into the model. Furthermore, the inter-relationships among these variables are evaluated simultaneously, which is of utmost importance (Awang, 2014). However, similar to the primary assumption for Ordinary Least Squares Regression (OLS), the main assumption for structural equation modeling (SEM) also assumes that there should be no multi-collinearity. Structural Equation Modeling (SEM) is more useful than other mediation analysis forms because it processes complex interconnections within one framework. Unlike causal mediation analysis which attempts to split effects into parts for some complex relations, SEM is able to take a comprehensive approach by evaluating multiple relationships at once. Also, Bayesian mediation analysis is useful for small datasets and

for introducing prior knowledge, but it is much less effective for large scale datasets compared to the study's panel of 84 countries because it is highly computational demanding. In contrast, SEM is effective in large scale data. Moreover, SEM is an alternative to Generalized Additive Models (GAMs). Although GAMs are useful in capturing non-linear relationships, they are not appropriate in separating direct and indirect pathways which are central to mediation analysis. Therefore, SEM gives a coherent and powerful approach to capturing and measuring all forms of mediation effects.

Researchers can mediation analysis and study direct and indirect impacts within social and management sciences by applying structural equation modeling (SEM). Unlike traditional regression techniques used in mediation analysis, SEM has the capability to estimate all the regression models at once. Mediation analysis using SEM identifies the indirect effect an independent variable has on a dependent variable via a mediator variable. To calculate the financial intermediation's indirect impact on economic growth through entrepreneurship, the moderated mediation technique is used as described in Muller et al. (2005). The same methodology was utilized by Preacher et al. (2007), and later recommended by Hayes and Scharkow (2013) for examining the mediating effect. In the last few years, scholars from the social sciences and management sciences have increasingly been using the SEM approach for studying mediation effects. According to Mehmetoglu (2018), one of the most important factors that have contributed to the success of this adoption is the availability of statistical packages that are built specifically for the purpose of mediation analysis.

For the purpose of conducting a mediation analysis, researchers often use the methodology proposed by Baron and Kenny (1986), which is also recently proposed by Kenny (2024) in another context. Within the framework of this approach, there are three basic processes that must be followed in order to create mediation. Following is an explanation of these steps:

Step 1: Regress *EG* on *FI* to evaluate the financial intermediation's direct effect on economic growth. Since this effect needs to be statistically significant, it suggests that there is an effect that requires mediation.

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 \ln HD_{it} + \varepsilon_{it} \ldots . (3.45)$$

Where *EG* is the dependent variable, *FI* is the independent variable and variables *I*, *PE* and *HD* are control variables.

Step 2: For direct impact of financial intermediation on entrepreneurship, regress *Ent* on *FI*. To demonstrate that there is a relationship between the independent and mediator variables, this analysis must also be statistically significant.

$$\ln Ent_{it} = \varphi_0 + \varphi_1 \ln FI_{it} + \varphi_2 \ln UN_{it} + \varphi_3 GE_{it} + \varphi_4 RL_{it} + \mu_{it} \ldots . (3.46)$$

Where *Ent* is the Mediator, *FI* is an independent variable and variables *UN*, *GE* and *RL* are control variables

Step 3: Perform a regression analysis where the dependent variable is economic growth (EG) and the independent variable is entrepreneurship (Ent), while controlling for the influence of a third variable, financial intermediation (FI). This analysis determines the direct effect of entrepreneurship on economic growth which is expected to be statistically significant. EG and Ent may be associated due to the confounding effect of FI, which influences both variables. To assess the indirect impact of FI on EG through the mediator (Ent), the influence or effect of FI is diminished after accounting for the mediator because a portion of the effect has been transferred through the mediator (Ent).

$$\ln EG_{it} = \delta_0 + \delta_1 \ln FI_{it} + \sigma_1 \ln Ent_{it} + \delta_2 \ln I_{it} + \delta_3 \ln PE_{it} + \delta_4 \ln HD_{it} + \omega_{it} \ldots . (3.47)$$

If both step 1 and step 2 are fulfilled, and the impact of FI becomes insignificant in step 3, meaning that the direct effect has reduced to the extent that it is no longer meaningful, it can be said that Ent fully mediates the relationship between FI and EG. However, if the direct impact of FI in step 3 is significant but reduced, than it can be stated that Ent partially acts as a mediator in the interaction between FI and EG. Partial mediation, as described by Baron and Kenny (1986), is a more realistic concept and it only occurs if all of the above-mentioned procedures are fulfilled.

Iacobucci et al. (2007) ascertained that SEM outperforms the traditional regression technique when it comes to mediation analysis. They carried out a series of Monte Carlo simulations and claimed that the basic regression method produces larger standard errors for the coefficients, leading to estimates that are less precise.

The difference is primarily due to SEM computations involving all model parameters at once. This allows for greater understanding regarding the relations between the variables. On the other hand, the separate calculations with the regression approach may introduce inefficiencies and higher standard errors. Because of these advantages, Structural Equation Modeling (SEM) is considered a standard framework for mediation analysis which offers a robust and reliable approach for analyzing the relationships amongst variables.

Sobel's (1987) z-test is used for mediation effect validation and its purpose is to test the hypothesis that the mediation effect is significant. The following formula is employed to compute the z-value:

$$z = \frac{\varphi_1 \times \sigma_1}{\sqrt{\sigma_1^{\,2} s_{\varphi_1}^2 + \varphi_1^{\,2} s_{\sigma_1}^2}} \ldots . (3.48)$$

where the scalar parameter φ_1 and $s_{\varphi_1}^2$ (standard error of φ_1) come from step 2, and σ_1 and $s_{\sigma_1}^2$ (standard error of σ_1) come from step 3 described above. If $z > \pm 1.96$ then the mediation is statistically significant at 0.05.

Zhao et al. (2010) also consider structural equation modeling (SEM) an appropriate technique for conducting mediation analysis. However, to assess the indirect effect's significance, they employed bootstrap test instead of using Monte Carlo simulations. Bootstrapping generates an empirical sampling distribution of a statistic, (which in our study is the mediated/indirect effect) by calculating and gathering the indirect effects from each of the n samples that are randomly selected with replacement from the original sample data. The standard error and subsequent confidence interval are derived using the bootstrap/empirical distribution in order to assess the statistical significance of the

indirect effect. If the confidence interval of the indirect effect does not contain the value of zero, it is determined that the indirect impact is statistically significant.

In order to assess the mediation, this study makes use of both the approaches, the one proposed by Baron and Kenny (1986) as well as the approach proposed by Zhao et al. (2010). *Medsem* is a command in Stata which estimates all regression models at once unlike the traditional approach which does sequential regression analyses. As described by Mehmetoglu (2018), *medsem* is a post estimation command that is typed in after the estimation of a mediation model using the built-in *sem* command for structural equation modeling (SEM) in Stata.

3.9.1.4. Effect size of the mediation

The methodology that can be utilized to determine the degree of the influence that is created by an indirect effect is the analysis of standardized coefficients (Kenny, 2024). The magnitude the indirect impact can be computed by dividing the indirect effect by the total effect. The RIT i.e. ratio of indirect effect to total effect is expressed in the formula shown below:

$$RIT = \frac{\varphi_1 \times \sigma_1}{(\varphi_1 \times \sigma_1) + \delta_1} \ldots . (3.49)$$

The value of RIT indicates the proportion of the effect of financial intermediation on economic growth mediated by entrepreneurship (MacKinnon, 2012).

Another useful approach to assess the magnitude of an indirect effect is by calculating the ratio of the indirect effect to the direct effect (RID). The ratio quantifies the extent to which the mediator (Ent) mediates the relationship of independent variable (FI) with the dependent variable (EG), relative to the FI's direct effect on EG. A higher value of RID indicates that a substantial amount of the overall effect is influenced by the mediator, whereas a lower RID denotes that the direct effect is more prominent.

$$RID = \frac{\varphi_1 \times \sigma_1}{\delta_1} \ldots . (3.50)$$

The value of RID represents the relative size of mediation effect as compared to the direct effect (MacKinnon, 2012).

3.9.2. Estimation Procedure for Time Series

This section's purpose is to provide an overview of the procedure used for estimation of time series data to examine the relationship of financial intermediation with growth of Pakistan's economy, specifically through the channel of entrepreneurship.

3.9.2.1. Stationarity Procedure of the Data

The stationarity of the data must be confirmed because it has an immediate impact on the reliability and accuracy of the model (Hill et al., 2001). If the data is not stationary, the mean and variance are time dependent, or only the mean or variance is, and as time increases, the variance likewise increases. Therefore, non-stationary series must be differentiated to make it stationary, in order to get robust results, and eliminate spurious regression (Asteriou & Hall, 2006). The series is stationary when it is mean reverting with constant variance and mean across time and the covariance between the two periods varies solely on the interval between the periods. Therefore, unit root tests are conducted in order to ascertain the stationarity of the series. The concept of time series stationarity is fundamental to the augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1981), the Phillip-Parron (PP) test (Phillips & Perron, 1988), and the KPSS test (Kwiatkowski et al., 1992) for identifying the presence of a unit root.

This study utilizes the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to detect the presence of a unit root. These tests use the assumption that the error term ε_t should be asymptotically normal i.e. approach a normal distribution as the sample size increases. The equations, both with and without trend, are specified as:

$$\Delta y_t = a_0 + \beta y_{t-1} + \lambda_i \sum_{i=1}^{n} \Delta y_{t-i} + \varepsilon_t \ \ldots . (3.51)$$

$$\Delta y_t = a_0 + a_0 t + \beta y_{t-1} + \lambda_i \sum_{i=1}^{n} \Delta y_{t-i} + \varepsilon_t \ \ldots . (3.52)$$

y_t : variable of interest, $\Delta y_t = (y_t - y_{t-1})$, $\Delta y_{t-1} = (y_{t-1} - y_{t-2})$, null hypothesis : $\beta = 0$, alternate hypothesis : $\beta \neq 0$, ε_t : error-term,

The rejection of null hypothesis confirms the stationarity of the data. If a unit root is identified at the level, it indicates that the series is not stationary. To make the series stationary, the first difference is taken, and the variables are considered to be integrated of order one, denoted as I(1). If the presence of a unit root persists, the second difference is calculated and the variables are integrated of order two, denoted as I(2), and so on.

3.9.2.2. Testing for Cointegration

Time series analysis require stationarity of data for determining the long run relationship i.e. cointegration to get rid of spurious results. There are several tests of conintegration in the literature, however this study employs Auto Regressive Distributive Lag (ARDL) model for testing cointegration.

3.9.2.3. Auto Regressive Distributive Lag (ARDL) Model

In the last few decades various tests have been employed for cointegration which includes residual based test (Engle & Granger, 1987), maximum likelihood based test (Johansen, 1988; Johansen & Juselius, 1990; Johansen, 1991; Johansen, 1995). These models of cointegration faced certain limitations specifically in context of variable integration order. However, Pesaran & Shin (1998) proposed Auto Regressive Distributive Lag (ARDL) model, which is a cointegration model that overcomes those limitations. This model depicts larger flexibility in the integration order of variables i.e. either I(0) or I(1), robust long run results and derives the error correction term through linear transformation. The same has been elaborated further by (Pesaran et al., 2001; Narayan, 2004; Odhiambo, 2008). Moreover, this approach when compared to other cointegrating techniques such as

Johansen cointegration, requires smaller sample size (Ghatak & Siddiki, 2001) and it also distinguishes the short and long run effects (Bentzen & Engsted, 2001).

Hence this study follows the Pesaran & Shin (1998) ARDL methodology to assess the financial intermediation's direct impact on economic growth as well as its direct impact on entrepreneurship.

A model has already been developed to examine the financial intermediation's direct impact on Economic Growth, as represented by Eq. 3.12. The equation is shown below:

$$\ln EG_t = \alpha_0 + \alpha_1 \ln FI_t + \alpha_2 \ln I_t + \alpha_3 \ln PE_t + \alpha_4 \ln HD_t + \varepsilon_t$$

Thus, the ARDL form of Eq. 3.12 can be written as:

$$\Delta \ln EG_t = \alpha_0 + \sum_{i=1}^{n} c_i \Delta \ln EG_{t-i} + \sum_{i=1}^{n} d_i \Delta \ln FI_{t-i} + \sum_{i=1}^{n} e_i \Delta \ln I_{t-i} + \sum_{i=1}^{n} f_i \Delta \ln PE_{t-i} + \sum_{i=1}^{n} g_i \Delta \ln HD_{t-i}$$

$$+ \phi_0 \ln EG_{t-1} + \phi_1 \ln FI_{t-1} + \phi_2 \ln I_{t-1} + \phi_3 \ln PE_{t-1} + \phi_3 \ln HD_{t-1} + \omega_t \ldots . (3.53)$$

where Δ is the first difference operator, α_0 is the drift components, *t* is the time trend, *n* is the maximum lag length, coefficients $c_i \, to \, g_i$ and $\phi_0 \; to \; \phi_4$ represent short-run and long-run elasticities, whereas ω_t is the typical white noise error term.

Furthermore, the matrix form of Eq. 3.50 is depicted in the below equation (Eq. 3.51), where every variable of research is considered dependent.

$$(1-B)\begin{bmatrix} \ln EG \\ \ln FI \\ \ln I \\ \ln PE \\ \ln HD \end{bmatrix} = \begin{bmatrix} \alpha_0 \\ \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \end{bmatrix} + \sum_{i=1}^{K} 1-B \begin{bmatrix} \ln EG \\ \ln FI \\ \ln I \\ \ln PE \\ \ln HD \end{bmatrix}_{t-i} \times \begin{bmatrix} c_{11} & c_{12} & c_{13} & c_{14} & c_{15} \\ d_{11} & d_{12} & d_{13} & d_{14} & d_{15} \\ e_{11} & e_{12} & e_{13} & e_{14} & e_{15} \\ f_{11} & f_{12} & f_{13} & f_{14} & f_{15} \\ g_{11} & g_{12} & g_{13} & g_{14} & g_{15} \end{bmatrix} + \begin{bmatrix} \ln EG \\ \ln FI \\ \ln I \\ \ln PE \\ \ln HD \end{bmatrix}_{t-1} \times \begin{bmatrix} \phi_{11} & \phi_{12} & \phi_{13} & \phi_{14} & \phi_{15} \\ \phi_{21} & \phi_{22} & \phi_{23} & \phi_{24} & \phi_{25} \\ \phi_{31} & \phi_{32} & \phi_{33} & \phi_{34} & \phi_{35} \\ \phi_{41} & \phi_{42} & \phi_{43} & \phi_{44} & \phi_{45} \\ \phi_{51} & \phi_{52} & \phi_{53} & g_{54} & g_{55} \end{bmatrix} + \begin{bmatrix} \omega \\ \omega \\ \omega \\ \omega \\ \omega \end{bmatrix}_t \ldots$$

(3.54)

This study formulates hypotheses to assess the existence of long-term as well as short-term cointegration i.e. The null hypothesis (H_0) over the long run in Eq. 3.51 is that there is no cointegration [$H_0 : \phi_{11}$ to $\phi_{55} = 0$]. The existence of cointergration [$H_1 : \phi_{11}$ to $\phi_{55} \neq 0$] is the alternative hypothesis (H_1). Similarly, in short-run, association exists [$H_1 : c_{1i}$ to $g_{5i} \neq 0$] is the alternative hypothesis (H_1), whereas the null hypothesis (H_0) is [$H_0 : c_{1i}$ to $g_{5i} = 0$] i.e. association doesn't exist.

To analyze the financial intermediation's direct effect on entrepreneurship, a model has already been constructed as outlined in Equation 3.13, which is reiterated below:

$$\ln Ent_t = \beta_0 + \beta_1 \ln FI_t + \beta_2 \ln UN_t + \beta_3 GE_t + \beta_4 RL_t + \mu_t$$

In the same way ARDL form of (Eq. 3.13) can be written as:

$$\Delta \ln Ent_t = \beta_0 + \sum_{i=1}^{n} k_i \Delta \ln Ent_{t-i} + \sum_{i=0}^{n} l_i \Delta \ln FI_{t-i} + \sum_{i=0}^{n} m_i \Delta \ln UN_{t-i} + \sum_{i=0}^{n} n_i \Delta GE_{t-i} + \sum_{i=0}^{n} o_i \Delta RL_{t-i} +$$

$$\sigma_0 \ln Ent_{t-1} + \sigma_1 \ln FI_{t-1} + \sigma_2 \ln UN_{t-1} + \sigma_3 GE_{t-1} + \sigma_4 RL_{t-1} + \varepsilon_t \ldots . (3.55)$$

Likewise Δ is the first difference operator, β_0 is the drift component, t is the time trend, n is the maximum lag length, coefficients k_i *to* o_i and σ_0 to σ_4 represent short-run and long-run elasticities, whereas ε_t is the typical white noise error term.

Further, Eq. 3.52 can be rewritten into matrix form where each study variable serves as the dependent variable in the model (see Eq. 3.53)

$$(1-B)\begin{bmatrix} \ln Ent \\ \ln FI \\ \ln UN \\ GE \\ RL \end{bmatrix} = \begin{bmatrix} \beta_0 \\ \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix} + \sum_{i=1}^{K} 1-B \begin{bmatrix} \ln Ent \\ \ln FI \\ \ln UN \\ GE \\ RL \end{bmatrix}_{t-i} \times \begin{bmatrix} k_{11} & k_{12} & k_{13} & k_{14} & k_{15} \\ l_{11} & l_{12} & l_{13} & l_{13} & l_{13} \\ m_{11} & m_{12} & m_{13} & m_{14} & m_{15} \\ n_{11} & n_{12} & n_{13} & n_{14} & n_{15} \\ o_{11} & o_{12} & o_{13} & o_{14} & o_{15} \end{bmatrix} + \begin{bmatrix} \ln Ent \\ \ln FI \\ \ln UN \\ GE \\ RL \end{bmatrix}_{t-1} \times \begin{bmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} & \sigma_{14} & \sigma_{15} \\ \sigma_{21} & \sigma_{22} & \sigma_{23} & \sigma_{24} & \sigma_{25} \\ \sigma_{31} & \sigma_{32} & \sigma_{33} & \sigma_{34} & \sigma_{35} \\ \sigma_{41} & \sigma_{42} & \sigma_{43} & \sigma_{44} & \sigma_{45} \\ \sigma_{51} & \sigma_{52} & \sigma_{53} & \sigma_{54} & \sigma_{55} \end{bmatrix} + \begin{bmatrix} \varepsilon \\ \varepsilon \\ \varepsilon \\ \varepsilon \\ \varepsilon \end{bmatrix}_t \ldots$$

.(3.56)

This study formulates hypothesis to gauge the existence of long-run and short-run cointegration. For long run in Eq. (3.53) the null hypothesis (H_0) is no cointergration existence [$H_0 : \sigma_{11}$ to $\sigma_{55} = 0$]. The alternative hypothesis (H_1) is the existence of cointergration [$H_1 : \sigma_{11}$ to $\sigma_{55} \neq 0$]. For short-run, the null hypothesis (H_0) is no short-run relationship [$H_0 : k_{1i}$ to $o_{5i} = 0$], and in the alternative hypothesis (H_1), there is a short-run relation [$H_1 : k_{1i}$ to $o_{5i} \neq 0$].

The f-statistic and critical values are compared to determine the rejection or acceptance of the hypothesis and to draw a definitive conclusion about cointegration (Pesaran et al., 2001; Narayan, 2004). Existence of cointegration is confirmed when the critical value of upper bound is exceeded by the value of f-statistic. Additionally, any possibility of serial correlation in the model is tested by running test of LM Breusch-Godfrey, Existence of homoscedasticity is checked by applying test of LM Breusch Pagen, the Ramsey RESET test is run to determine if the functional form of the model is correct and the Jarque-Berra (JB) test of normality is used to verify if the data are normal.

3.9.2.4. Structural Equation Modeling (SEM) for testing Mediation in case of Pakistan

As mentioned earlier, SEM is used to examine multivariate data and overcomes the constraints of Ordinary Least Square (OLS) regressions (Akinyode, 2016). The method is classified as a Second Generation Method having the potential to incorporate several indicators and observed variables into the model simultaneously, allowing for the simultaneous examination of associations among these variables (Awang, 2014). During mediation analysis, researchers can utilize structural equation modeling (SEM) to simultaneously estimate all of the regression models. Mediation analysis is used to assess the independent variable's indirect impact on the dependent variable by analyzing the role of a mediator in this effect. To analyze the financial intermediation's indirect effect on economic growth through the channel of entrepreneurship, moderated mediation method is applied following (Muller et al., 2005). Preacher et al. (2007) also used this methodology and the same is also suggested by (Hayes & Scharkow, 2013) to examine the mediating effect. Recently, researchers in social sciences and management sciences

have increasingly started using structural equation modeling (SEM) to analyze the impact of mediation due to the availability of statistical software packages designed expressly for mediation study. (Mehmetoglu, 2018)

Researchers frequently refer to the technique put forward by Baron and Kenny (1986) when undertaking a mediation analysis. This methodology is more recently proposed by Kenny (2024) in a different setting. There are three main steps to take within this method's framework to develop mediation. Below is an explanation of the procedures:

Step 1: Regress *EG* on *FI* to evaluate the financial intermediation's direct effect on economic growth. Since this effect needs to be statistically significant, it suggests that there is an effect that requires mediation.

$$\ln EG_t = \alpha_0 + \alpha_1 \ln FI_t + \alpha_2 \ln I_t + \alpha_3 \ln PE_t + \alpha_4 \ln HD_t + \varepsilon_t \ldots . (3.57)$$

Where *EG* is the dependent variable, *FI* is the independent variable and variables *I, PE* and *HD* are control variables.

Step 2: The direct impact of financial intermediation on entrepreneurship is evaluated by regressing *Ent* on *FI*. This analysis must also be statistically significant in order to provide evidence that independent and mediator variable are related.

$$\ln Ent_t = \beta_0 + \beta_1 \ln FI_t + \beta_2 \ln UN_t + \beta_3 GE_t + \beta_4 RL_t + \mu_t \ldots . (3.58)$$

Where *Ent* is the Mediator, *FI* is an independent variable and variables *UN*, *GE* and *RL* are control variables

Step 3: Conduct a regression analysis with economic growth (EG) as the dependent variable and entrepreneurship (Ent) as the independent variable, while controlling for the impact of financial intermediation (FI). The relationship between entrepreneurship and economic growth is anticipated to be statistically significant. Since FI affects both EG and Ent, it's possible that the two are related. In order to evaluate the indirect impact of FI on

EG via the mediator, the influence or effect of FI is reduced after accounting for the mediator (Ent) since some of its effect has been transferred through the mediator.

$$\ln EG_t = \alpha_0 + \alpha_1 \ln FI_t + \gamma_1 \ln Ent_t + \alpha_2 \ln I_t + \alpha_3 \ln PE_t + \alpha_4 \ln HD_t + \omega_t \ldots . (3.59)$$

If both step 1 and step 2 are met, but the impact of FI in step 3 becomes insignificant than it means that the direct effect is no longer meaningful, hence it can be said that Ent fully mediates the relationship between FI and EG. However, if the direct impact of FI in step 3 is significant but reduced, than it can be stated that Ent partially mediates the interaction between FI and EG. Partial mediation, as described by Baron and Kenny (1986), is a more realistic concept and it only occurs if all of the above-mentioned procedures are fulfilled.

By performing a set of Monte Carlo simulations, Iacobucci et al. (2007) established that Structural Equation Modelling (SEM) surpasses regression for mediation analysis. Their investigation shows that simple regression produces higher coefficient standard errors, leading in less accurate estimates. However, SEM due to its simultaneous calculation of all model parameters, provides a more exact and full understanding of variable associations. Moreover, regression calculates parameters individually, which may increase standard errors and inefficiency. Therefore, Structural Equation Modelling (SEM) has become the standard for mediation research due to its reliability and resilience in studying complicated variable interactions.

Validation of mediation outcomes is frequently accomplished using the z-test proposed by Sobel (1987). According to Iacobucci et al. (2007), this test is employed to ascertain the mediation effect's statistical significance. The z-value is computed using the following formula:

$$z = \frac{\beta_1 \times \gamma_1}{\sqrt{\gamma_1^{\,2} s_{\beta_1}^2 + \beta_1^{\,2} s_{\gamma_1}^2}} \ldots . (3.60)$$

Where the scalar parameter β_1 and $s^2_{\beta_1}$ (standard error of β_1) come from step 2, and γ_1 and $s^2_{\gamma_1}$ (standard error of γ_1) come from step 3. The mediation is considered statistically significant at 0.05, when $z > \pm 1.96$

Zhao et al. (2010) also regarded structural equation modelling (SEM) a suitable technique for conducting mediation analysis. However, rather than Monte Carlo simulations, they opted to employ the bootstrap test to evaluate the significance of the indirect effect. Bootstrapping creates a sampling distribution of a statistic which is empirical by calculating and collecting the indirect effects from each of the n samples that are randomly chosen with replacement from the original sample data. The standard error and consequent confidence interval are calculated using the bootstrap/empirical distribution to evaluate the statistical significance of the indirect effect. In order to conduct significance testing for any regression coefficient, the criterion is that if the confidence interval of the indirect effect does not include the value of zero, it can be concluded that the indirect influence is statistically significant.

This study evaluates the mediation by employing both the approaches i.e. proposed by Baron and Kenny (1986) and Zhao et al. (2010). Unlike the traditional approach of conducting sequential regression analyses, the *medsem* command in Stata is employed to estimate all regression models simultaneously. This is in contrast to the conventional approach of conducting consecutive regression analysis. Mehmetoglu (2018) defines *medsem* as a post-estimation command that is entered after estimating a mediation model using the built-in *sem* command for structural equation modeling (SEM) in Stata.

3.9.2.5. Effect size of the mediation

The methodology that can be utilized to determine the degree of the influence that is created by an indirect effect is the analysis of standardized coefficients (Kenny, 2024). The magnitude the indirect impact can be computed by dividing the indirect effect by the total effect. The RIT i.e. ratio of indirect effect to total effect is expressed in the formula shown below:

$$RIT = \frac{\beta_1 \times \gamma_1}{(\beta_1 \times \gamma_1) + \alpha_1} \ldots . (3.61)$$

The value of RIT indicates the proportion of the effect of financial intermediation on economic growth mediated by entrepreneurship (MacKinnon, 2012).

Another useful approach to assess the magnitude of an indirect effect is by calculating the ratio of the indirect effect to the direct effect (RID). The ratio quantifies the extent to which the mediator (Ent) mediates the relationship of independent variable (FI) with the dependent variable (EG), relative to the FI's direct effect on EG. A higher value of RID indicates that a substantial amount of the overall effect is influenced by the mediator, whereas a lower RID denotes that the direct effect is more prominent.

$$RID = \frac{\beta_1 \times \gamma_1}{\alpha_1} \ldots . (3.62)$$

The value of RID represents the relative size of mediation effect as compared to the direct effect (MacKinnon, 2012).

3.10. Conclusion

This chapter presents a thorough framework to comprehend the connection between financial intermediation, entrepreneurship, and economic growth. In attempt to address the problem statement and to achieves the objectives of the study, this chapter presents a theoretical framework followed by a conceptual framework and develops a model to identify the financial intermediation's direct impact on entrepreneurship and economic growth, as well as its indirect effect mediated through entrepreneurship. After discussing the data and its sources the chapter proceeds with comprehensive definitions and description of the variables used in the analysis. Then, this chapter develops research instruments which employ various econometric approaches for analyzing the data by ensuring the reliability with proper justification. This chapter provides a solid base for subsequent analyses and discussions to understand the finance, entrepreneurship and growth nexus.

CHAPTER – 4

RESULTS AND DISCUSSION: PANEL DATA ANALYSIS

4.1. Introduction

The empirical findings of the panel data analysis are presented in this chapter and discussed using three different models. The first model examines the association between financial intermediation and economic growth, the second explores the relationship between financial intermediation and entrepreneurship, while the third analyzes the mediating effect that entrepreneurship has in the association of financial intermediation with economic growth. The full panel is comprised of eighty four countries which include innovation driven economies, efficiency driven economies and resource/factor driven economies classified by Global Entrepreneurship Monitor (GEM). This chapter is comprised of four sections. In the first section, global analysis is performed to examine the nexus between financial intermediation, entrepreneurship and economic growth particularly focusing on the mediating role of entrepreneurship. Further, this study is bifurcated into three separate sections. The second section analyzes the same nexus in innovation driven economies. In the third section, the same relationship is analyzed in efficiency driven economies. The fourth section investigates the same link in resource driven economies. The estimation results are based on data for the period 1996 to 2020. Appropriate panel data techniques i.e. pooled OLS, random effects (RE), fixed effects (FE) and generalized method of moments (GMM) are used for testing the financial intermediation's direct effect on both the economic growth and entrepreneurship to authenticate the findings of structural equation modeling. However, to examine the mediation impact of entrepreneurship in financial intermediation and economic growth, this study uses structural equation modeling (SEM). By examining these models in all these panels, the chapter provides a deeper understanding of the interconnectedness between these variables in a cross country analysis.

4.2. Global Analysis (Full Panel)

The purpose of this section is to determine whether entrepreneurship mediates the relationship between financial intermediation and economic growth globally i.e. in all the selected countries. Initially, the financial intermediation's direct impact on economic growth is examined. Subsequently, the financial intermediation's direct impact on entrepreneurship is examined. Finally, the financial intermediation's indirect impact on economic growth through the channel of entrepreneurship is examined.

4.2.1. Descriptive Statistics

The global panel dataset's descriptive statistics shed light on the type and distribution of the variables in the dataset. Such statistics describe the features of the dataset while providing a broad overview of the variables and are especially critical in determining whether the variables of the dataset are appropriate for further regression analysis.

Table 4.1 provides descriptive statistics for panel data spanning 84 countries over 25 years. The number of observations varies due to missing values in some variables and is specified against each variable. Upper panel of the table 4.1 displays descriptive statistics of the original dataset. The statistics in this panel reveal that economic growth (EG), which is real GDP measured in billions of USD, has a mean of 780 with a wide range from 0.344 to 20,000, and a high standard deviation (SD = 2270), indicating significant disparities in the economic size of countries. The high skewness (5.678) and extreme kurtosis (38.312) further suggest the presence of a few exceptionally large economies acting as outliers. Entrepreneurship (ENT) averages 31.37 with a maximum value of 95.13 and a standard deviation of 23.367, showing substantial cross-country variation. Its positive skewness (1.080) and moderate kurtosis (3.016) point to a right-skewed distribution with a few countries having much higher entrepreneurial activity. Financial intermediation (FI) exhibits a mean of 71.511 and a wide range from 0.186 to 308.978, with moderate skewness (0.790) and kurtosis (3.063), suggesting a somewhat dispersed but still right-skewed distribution. Investment (I) and Unemployment (UN) display means of 22.699 and 8.026 respectively, with both variables showing positive skewness (1.130 for I and 1.587 for UN), indicating that some countries experience significantly higher levels of investment and unemployment. Public expenditure (PE) has a relatively

symmetric distribution with a mean of 16.513 and slight negative skewness (-0.133), while human development (HD) exhibits a mean of 0.763 and negative skewness (-0.822), suggesting a clustering of countries toward higher human development levels. Government effectiveness (GE) and Rule of Law (RL) have means of 0.566 and 0.461 respectively, with near-zero skewness and low kurtosis values, indicating relatively symmetric and light-tailed distributions.

Table 4.1: Descriptive Statistics (Global Panel)

Descriptive Statistics before Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
EG (Billion USD)	2090	780	20000	0.344	2270	5.678	38.312
ENT	2100	31.371	95.13	2.94	23.367	1.080	3.016
FI	1653	71.511	308.978	0.186	50.101	0.790	3.063
I	1992	22.699	53.591	8.948	5.648	1.130	5.500
PE	1912	16.513	30.069	0.951	5.034	-0.133	2.472
UN	2100	8.026	33.29	0.21	5.780	1.587	5.627
HD	1954	0.763	0.957	0.293	0.141	-0.822	2.902
GE	2087	0.566	2.436	-1.299	0.937	0.071	1.799
RL	2098	0.461	2.129	-1.441	0.974	0.051	1.701
Descriptive Statistics after Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
lnEG	2090	25.603	30.625	19.655	2.021	-0.222	3.134
lnENT	2100	14.077	19.894	9.567	2.039	-0.146	2.951
lnFI	1653	24.965	31.273	18.049	2.519	-0.245	2.601
lnI	1992	24.091	29.442	18.049	2.056	-0.176	3.099
lnPE	1912	23.746	28.657	17.926	2.076	-0.123	2.892
lnUN	2100	12.824	17.421	5.898	1.745	-0.545	4.472
HD	1954	0.763	0.957	0.293	0.141	-0.822	2.902
GE	2087	0.566	2.436	-1.299	0.937	0.170	1.799
RL	2098	0.461	2.129	-1.441	0.974	0.151	1.701

Table 4.1 presents the descriptive statistics for the variables used in the global panel analysis. The table includes the number of observations (Obs), mean, standard deviation (Std. Dev), minimum (Min), maximum (Max), skewness (Sk), and kurtosis (K) for each variable.

Based on the descriptive statistics shown in the upper panel, all variables excluding index-based measures have been standardized to ensure scale consistency, as outlined in the variable description section 3.8. Furthermore, log transformation has been applied to these variables to address skewness and satisfy the assumption of normality. The resulting descriptive statistics, post-standardization and transformation, are presented in the lower panel of table 4.1.

The mean values in the lower panel suggest reasonable central tendencies, while the standard deviations indicate moderate dispersion across countries and time periods. Most variables exhibit normal distributions, with skewness values close to zero and kurtosis values around the benchmark of three. The economic growth (lnEG) has a mean value of 25.603 with a standard deviation of 2.021, ranging from a minimum of 19.655 to a

maximum of 30.625. Entrepreneurship (lnENT) has a mean of 14.077 and a standard deviation of 2.039, while financial intermediation (lnFI) records a mean of 24.965 and the highest variability with a standard deviation of 2.519. The control variables investment (lnI), public expenditure (lnPE), and unemployment (lnUN) have mean values of 24.091, 23.746, and 12.824, respectively, all displaying moderate dispersion. Human development (HD), government effectiveness (GE), and rule of law (RL) exhibit means of 0.763, 0.566, and 0.461, with standard deviations below 1. Skewness (Sk) and kurtosis (K) values for all variables are within acceptable ranges, with skewness values between -0.822 and 0.170 and kurtosis values ranging from 1.701 (RL) to 4.472 (lnUN), indicating approximately symmetric distributions with no significant deviations from normality. These characteristics suggest that the dataset is well-suited for further econometric analysis.

4.2.2. Effect of Financial Intermediation on Economic Growth

This section uses the first model to analyze the financial intermediation's direct effect on economic growth. The necessary condition of SEM demands that the direct impact must be statistically significant. Appropriate panel data techniques are used to tackle any possible econometric problems, such as heterogeneity and endogeneity etc. to ensure accuracy of the results. This study employs different panel techniques to account for various data characteristics and to address any econometric issues. Pooled OLS is used to have an understanding of the relationships between variables which serves as a starting point of the analysis. It treats the panel data as a large pooled cross-section and ignores the panel structure. Due to the possibility of unobserved individual-specific effects that correlate with the explanatory variables, it may lead to skewed and inconsistent results. Therefore RE and FE are used to account for individual specific affects. Within RE, time-invariant variables can be included and it is assumed that these effects are uncorrelated with the explanatory variables. However, there is a possibility that the individual-specific effects are correlated with the explanatory variables, then RE estimates will be biased. Therefore, FE is used to control heterogeneity and unobserved individual-specific effects by allowing each entity to have its own intercept term but it cannot estimate the effects of time-invariant variables since these are absorbed by the individual-specific intercepts. Moreover both RE and FE have limitations to address endogeneity where explanatory variables are correlated with the error tem. Therefore, because of suspicion of

endogeneity GMM is used to address the presence of possible endogeneity by employing valid instruments which may be correlated with the explanatory variables but uncorrelated with the error tem. Therefore it can be said that the results of GMM are more authentic and robust. Moreover, Hensen Test is used to gauge the validity of these instruments. The results of all the techniques are displayed in the table 4.1 below, but this study relies on the results of GMM and therefore the results of GMM are interpreted because of the reasons explained above. The study seeks to provide a thorough and dependable evaluation of how financial intermediation impacts economic growth by integrating SEM with panel data analysis.

Table 4.2: Effect of Financial Intermediation on Economic Growth

	Pooled OLS	**Random Effect**	**Fixed Effect**	**GMM**
Variables	lnEG	lnEG	lnEG	lnEG
lnFI	.048***	.051**	.027**	.05***
	(.014)	(.018)	(.012)	(.013)
lnI	.578***	.317***	.241***	.29***
	(.026)	(.035)	(.018)	(.021)
lnPE	.374***	.464***	.272***	.331***
	(.024)	(.059)	(.029)	(.026)
HD	-.827***	.528**	2.646***	.861***
	(.100)	(.247)	(.267)	(.274)
Cons	2.194***	5.256***	10.637***	8.882***
	(.117)	(.622)	(.602)	(.382)
Observations	1529	1529	1529	1369
Countries	84	84	84	84
Hansen J-Test	.254		AR(1)	.004
Wald Test	.000		AR(2)	.969

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.2 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Economic Growth (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and private investment (I), public expenditure (PE), and human development (HD) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

It is obvious from the table 4.2 that the results depicted by GMM are more robust in terms of signs and sizes of coefficients and levels of significance. The validity of the instruments employed in Generalized Method of Moments (GMM) estimations is evaluated using the Hansen test (or Hansen J test). The p-value 0.254 indicates the acceptance of null hypothesis. It suggests that the instruments employed in the model are suitable and that the model is accurately specified in terms of over-identifying restrictions. In this analysis, instruments are incorporated by taking the second to fourth lags of the independent variable and the control variables. While there is no formal

Cragg-Donald test for weak instruments in GMM, instrument strength is inferred by examining the first-stage regression results and the Wald F-statistics. In this analysis, it is observed that the F-statistic values are not less than the conventional threshold of 10, suggesting that the instruments are not weak. Weak instruments are problematic because they fail to provide enough variation to properly identify the endogenous variables, which can lead to biased and inconsistent estimates. Strong instruments, on the other hand, are highly correlated with the endogenous regressors and uncorrelated with the error term, allowing for reliable estimation. The use of appropriately lagged variables helps ensure instrument relevance while addressing endogeneity concerns. The positive results from the Hansen and Wald tests, along with the manual inspection of F-statistics, support the conclusion that the instruments employed in this analysis are both valid and sufficiently strong. The first-order autocorrelation in the residuals of the model is verified by the AR(1) test. As the p-value is 0.004, this suggests that the residuals contain substantial evidence of first-order autocorrelation. This outcome is anticipated in dynamic panel models, as the lagged dependent variable is correlated with its preceding value. Nevertheless, the AR(2) test evaluates the residuals for second-order autocorrelation. The p-value of 0.969 indicates that the residuals do not contain any evidence of second-order autocorrelation, which is a desirable result. It corroborates the validity of the lagged instruments employed in the model. The Wald test is employed to evaluate the joint significance of the model coefficients. It evaluates the extent to which the dependent variable's variation is substantially explained by the explanatory variables. The p-value 0.000 suggests that the null hypothesis (that all coefficients are zero) is strongly rejected. Consequently, the explanatory variables are jointly significant in their ability to explain the dependent variable. This implies that the model possesses substantial explanatory power.

The results clearly demonstrate a significant positive effect of financial intermediation on economic growth at 1%. This positive relationship between financial intermediation and economic growth is broadly consistent with Yakubu et al. (2021), Yakubu and Abdallah (2021), Konstantakopoulou (2023), Ramesh and Guruprasad (2024), and many others in existing literature providing valuable insights into how this relationship manifests in different types of economies. Financial intermediaries promote savings by providing a range of financial products, which are then used for investment, thereby boosting economic growth. The significant influence can be attributed mostly to the availability

and ease of obtaining credit for both businesses and individuals. Financial institutions make it easier for funds to move from savers to borrowers, enabling the private sector and households to spend in productive ventures. This finding signifies the financial intermediation's importance in growth of all the countries and for all state of economies either driven by innovation or efficiency or resources although through different mechanisms. In case of resource driven economies, financial intermediation helps diversify the economy of these countries by channeling resources into non-resource sectors, reducing dependency on natural resources and enable them to overcome the challenges such as the resource curse and economic volatility. Financial intermediation provides credit and risk management tools that mitigate the effects of resource price volatility which ultimately stabilizes investments and leads to a balanced economic growth (Beck, 2012; Badeeb et al., 2017). As far as efficiency-driven economies are concerned, they are focused on improving production efficiency and competitiveness through industrialization and infrastructure development. Financial intermediaries in these countries improve the allocation of capital to the most productive sectors, support business activities, reduce the costs of external finance, thereby fostering investment, enhancing economic efficiency , competitiveness and overall economic growth. These economies benefit from financial intermediation and specifically support small businesses, which are vital for economic diversification and efficiency improvements. (Beck & Levine, 2004; Levine, 2005). When innovation-driven economies are analyzed which are characterized by high levels of R&D and advanced technological infrastructure, financial intermediation supports innovation by making it easier for firms to finance R&D projects, leading to higher productivity and economic growth. Thus financial intermediation facilitates innovation and R&D, which are crucial for sustained growth. Financial intermediaries also help manage the risks associated with innovation by offering diversified financial products and services. Financial development is particularly beneficial for industries that rely heavily on external finance, which is often the case in innovation-driven economies (Aghion et al., 2005; Beck et al., 2007). These insights underscore the importance of well-functioning financial systems in fostering economic growth across various economic contexts. However this finding contradicts with the studies (Robinson, 1952; Lucas, 1988; Laeven & Valencia, 2013) who have some dissenting views that suggest caution, highlight the potential negative effects of rapid financial sector expansion, such as financial crises, which can adversely affect growth of the economy. Contrary to these studies, the findings of this study exhibit financial

intermediation's favorable influence on growth of the economy. Despite some of these dissenting views, the predominant evidence supports the significant positive impact of financial intermediation in fostering growth of the economy. This underscores the importance of developing robust financial systems to achieve sustained economic progress across different types of economies.

Investment apparently sways positively on economic growth similar to the findings of Trpeski and Cvetanoska (2019) and Kong et al. (2020). This is due to the fact that increase in investment helps to expand the productive capability which ultimately elevates the productivity and contributes positively towards economic growth. The resultant outcome of investment is the increase in employment opportunities, enhanced infrastructure and path towards industrialization which helps to warrant ample growth in the economy. Moreover investment generates a crowding-in effect by attracting additional investment and financing nationally as well as from abroad. This helps to induce investment in latest machinery and equipment, updated technology and infrastructure i.e. transportation and communication system, energy efficiency etc., which further aides to improve production process, lowering cost of production and improvement in the quality of goods and services. Thus a multiplier effect is stimulated and contributes towards a progressive spillover influence on economic growth. This is why investment is of paramount importance for every country, whether it is innovation-driven, efficiency-driven, or resource-driven. Investment drives technological advancements, enhances productivity, and fosters diversification, all of which are essential for sustainable economic growth. These mechanisms operate across different sorts of economies, underscoring the relevance of investment in fostering economic development. Investments in R&D, infrastructure, and high-tech industries play a vital role for sustaining long-term growth usually in innovation driven countries. Innovation drives growth through creative destruction, where new technologies replace outdated ones, boosting productivity and economic output. Competitive advantage in these economies is maintained through continuous innovation, requiring substantial investment in human capital, infrastructure, and technology (Del-Aguila-Arcentales et al., 2023). On the same lines, efficiency-driven economies benefit significantly from investments that enhance productivity and improve the quality of infrastructure and human capital. In the countries that are particularly transitioning towards higher efficiency, investment usually focuses on upgrading industrial capabilities, enhancing infrastructure, upgrading

technology, improving logistics and transportation networks etc. which results in improving overall productivity (Du et al., 2022). In the same way in resource-driven economies, investment diversifies the economic base through investment in other sectors and reduces their dependency on natural resources and saves them from resource curse phenomena. Investments in infrastructure, education, and non-resource sectors help stabilize and sustain economic growth. Targeted investments in infrastructure and human capital allow them to achieve more stable and sustainable economic growth (Boamah et al., 2018). Thus investment positively influences economic growth across different types of economies which highlight the importance of capital accumulation and supporting the role of investment in sustaining growth.

It is apparent from the results that public expenditure significantly and positively influences economic growth in diverse panel of countries. The finding of this study is consistent with many researches which also exhibit the same impact of public expenditure on growth of the economy (for instance Keynes, 1936; Romer, 1986; Barro, 1990; Devarajan et al., 1996; Perotti, 2007; Becker, 2009) and many others. Public expenditure influences economic growth through various channels, including infrastructure development, human capital enhancement, support for R&D, social safety nets, macroeconomic stabilization, and the establishment of robust institutional frameworks etc. By strategically investing in these areas, governments can significantly enhance economic productivity and promote sustainable growth. The effectiveness of public spending in promoting growth depends on its composition, efficiency, and the economic context in which it is implemented. In innovation-driven economies, the focus of public expenditure is in supporting R&D, education, and infrastructure, all of them are vital for fostering technological advancements and maintaining competitiveness. Government funding plays an important role in enhancing R&D and innovation, moreover public investments often complement private sector innovation efforts and can help overcome market failures associated with high-risk research. Government spending on innovation and technology drives breakthroughs and sustains economic growth (Aghion et al., 2009; Mazzucato, 2011). When efficiency-driven economies are analyzed, governments direct the public investments in infrastructure, healthcare, and education, which enhance productivity. Public expenditure on infrastructure and human capital development enhances productivity and supports economic expansion. Investments in roads, ports, communication networks as well as in education and healthcare etc. lead to substantial

improvements in economic efficiency. Government spending creates an environment conducive to economic activities and crowds in private investment by reducing costs and risks associated with economic activities (Gurdal et al., 2021). Same is the case with resource-driven economies in which public expenditure diversifies the economic base and reduces the dependency on natural resources. Investments in infrastructure, education, and non-resource sectors help stabilize and sustain economic growth. Resource-rich countries can fall into the "resource curse," where reliance on natural resources can hinder growth therefore public spending on infrastructure diversifies the economy and achieves sustainable growth. Targeted public investments help these countries to avoid the pitfalls of the resource curse by fostering economic diversification and stability (Sebri et al., 2023). Thus Public expenditure drives technological advancements, enhances productivity, and fosters diversification, all of which are essential for sustainable economic growth. These mechanisms operate across different types of economies, underscoring the universal importance of government spending in fostering economic development.

The varying impact of Human development on economic growth across differen t methodologies can be attributed to the distinct ways these models account for unobserved heterogeneity and endogeneity. In the Pooled OLS model, the negative and significant coefficient for HD suggests omitted variable bias, as it does not control for country-specific effects, potentially leading to biased estimates. The RE model, while accounting for some of these unobserved effects, shows a positive coefficient at 5% significance level, indicating that the influence of HD is more accurately captured but still affected by random variations. The FE model results in a highly significant positive coefficient at the 1% level, but with a large value, reflecting the substantial within-country variation in HDI over time. Lastly, the GMM model, designed to address endogeneity by using instrumental variables, provides a positive and significant coefficient with a normal magnitude, suggesting that once endogeneity is appropriately handled, the HDI's true positive impact is revealed, confirming the robustness of the relationship. The favorable influence of human development matches the findings of Fatah et al. (2012) and Grubaugh (2015). It is apparent that enhancement in education, health and elevated per capita income helps to increase the productivity and expansion in economy. More educated, skilled and healthy workforce exhibits efficiency and prove to be more productive and innovative, finds to be involved in more research and development, which

ultimately translates into technological advancement and paves the way towards sustainability and economic prosperity. Thus Human development has a two way causality i.e. higher levels of human development lead to faster economic growth, emphasizing the feedback loop where economic growth also supports further improvements in Human development (Ranis et al., 2000). In innovation-driven economies, human development indicates a well-educated and healthy population, which contribute in further fostering innovation, technological advancements and economic progress (Miskiewicz-Nawrocka, 2020). In the same way efficiency-driven economies benefit from improvements in human development through enhanced productivity and the efficient use of resources (Elistia & Syahzuni, 2018; Gulcemal, 2020). Same is the case of resource-driven economies who often experience slower economic growth due to over-reliance on natural resources, so human development in these countries supports the development of a more versatile and adaptable workforce, capable of contributing to various sectors of the economy specifically non-resource sectors which reduces dependency on natural resources and result is enhanced economic productivity (Rahim et al., 2021). Thus human development drives technological advancements, enhances productivity, and fosters economic diversification, all of which are essential for sustainable economic growth. These mechanisms operate across different types of economies, underscoring the universal importance of human development in fostering economic progress.

4.2.3. Effect of Financial Intermediation on Entrepreneurship

This section estimates the second model to examine how financial intermediation affects entrepreneurship directly. To address econometric issues like heterogeneity and endogeneity, panel data methods are utilized to ensure results correctness and dependability. This study uses POLS, RE, FE, and GMM panel methods to account for data features and handle econometric difficulties. Pooled OLS is used to understand variable relationships as a starting point for analysis. It ignores panel structure and treats panel data as a huge pooled cross-section. Unobserved individual-specific effects that correlate with explanatory factors might distort and inconsistently estimate it. Thus, RE and FE account for individual effects. RE includes time-invariant variables and assumes these effects are uncorrelated with explanatory factors. If individual-specific effects are linked with explanatory variables, RE estimates may be skewed. Thus, FE controls

heterogeneity and unobserved individual-specific effects by giving each entity its own intercept term, but it cannot estimate time-invariant variables since they absorb them. RE and FE also struggle with endogeneity when explanatory variables are associated with error tems. Due to suspicions of endogeneity, GMM uses valid instruments that may be associated with the explanatory factors but uncorrelated with the error tem. Thus, GMM results are more reliable. The findings of all methodologies are shown in table 4.2 below, but this study relies on GMM, thus the results are interpreted for the reasons above.

Table 4.3: Effect of Financial Intermediation on Entrepreneurship

	Pooled OLS	**Random Effect**	**Fixed Effect**	**GMM**
Variables	lnEnt	lnEnt	lnEnt	lnEnt
lnFI	.194***	.123***	.118***	.22***
	(.021)	(.012)	(.007)	(.045)
lnUN	.750***	.041***	.018*	.769***
	(.023)	(.013)	(.01)	(.053)
GE	-.531***	-.125***	-.128***	-.557***
	(.095)	(.023)	(.021)	(.163)
RL	-.418***	-.116***	.088***	-.407**
	(.088)	(.028)	(.024)	(.162)
Cons	.092	10.483***	10.908***	-.784
	.316	(.394)	(.201)	(.655)
Observations	1638	1638	1638	1459
Countries	84	84	84	84
Hansen Test	.369		AR(1)	.017
Wald Test	.000		AR(2)	.748

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.3 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Entrepreneurship (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and unemployment (UN), government effectiveness (GE), and rule of law (RL) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

Table 4.3 shows that GMM results are more resilient in terms of coefficient signs and sizes, and significance. Hansen test (or Hansen J test) evaluates GMM estimation instruments' validity. The p-value 0.369 suggests the validity of the instruments. It suggests that the model's instruments are adequate and that over-identifying limits are accurately established. The instruments are formed using the second to fourth lags of the independent variable and the control variables. Although a formal Cragg-Donald test is not applicable in GMM settings, the strength of the instruments can be assessed through first-stage regression outcomes and the Wald F-statistics. Here, the F-statistics are consistently above the commonly accepted threshold of 10, indicating that the instruments are adequately strong. Weak instruments can pose serious problems by failing to capture

enough variation in the endogenous variables, potentially leading to biased and unreliable estimates. In contrast, strong instruments are those that are closely related to the endogenous regressors while remaining uncorrelated with the error term, making them suitable for consistent estimation. The use of lagged variables as instruments enhances their relevance and helps address potential endogeneity issues. The satisfactory outcomes of the Hansen and Wald tests, together with the observed F-statistics, confirm that the instruments used in this analysis are both valid and strong. AR(1) tests model residuals for first-order autocorrelation. According to the p-value of 0.017, the residuals show first-order autocorrelation. However, in AR(2) test, the p-value 0.748 shows that the residuals do not show second-order autocorrelation, which is good and validates the model's lagged instruments. The Wald test determines model coefficient joint significance. The p-value 0.000 suggests that coefficients are not zero and in explaining the dependent variable, the explanatory factors are jointly important. This implies that the explanatory variables explain well the model.

The results of full panel clearly show financial intermediation's favorable impact on entrepreneurship at 1% level of significance. This favorable impact is consistent with (Ajide, 2020; Dutta & Meierrieks, 2021) and many others in the existing literature. This finding is also in line with Schumpeterian entrepreneurship theory, which emphasizes the importance of access to financial resources in driving innovation and economic progress (Schumpeter, 1911). Financial intermediation mobilizes savings and distributes them to productive investments, which directly impacts entrepreneurship by providing the necessary capital. Governments of all the countries take initiatives to develop the financial sector and promote entrepreneurship. The aim is to provide loans to micro-entrepreneurs who usually do not qualify for standard financial services. These programs help a lot of people, especially in rural areas, to initiate and grow their businesses. The role of microfinance in fostering entrepreneurship is well documented and its impact on economic activity and alleviating poverty is profound (Khandker, 2005). Also, the increase in digital financial services promotes intermediation. The introduction of mobile banking and fintech has widened the scope of financial inclusivity and now, serviced by a larger population. The way financial transactions are conducted has changed drastically through digital platforms, which greatly aid entrepreneurs in accessing capital and managing their finances (Demirguc-Kunt et al., 2020). Financial intermediaries enhance entrepreneurship by efficiently supplying capital, lowering transaction costs, and offering

vital financial services that aid in the establishment and expansion of new enterprises. Better access to finance is associated with higher rates of new firm entry and lower barriers to entrepreneurship. This holds true in many countries with differing levels of economic development, and it is widely accepted that financial intermediation supports entrepreneurship in diverse economies (Klapper et al., 2006). In innovation-driven economies, financial support greatly influences entrepreneurial engagement. In these economies, entrepreneurs tend to seek out venture capital and equity financing for more innovative and potentially profitable projects. Thus, financial intermediaries serve one of the most critical functions in innovation and economic advancement by sponsoring entrepreneurs who seek to economically transform their countries through new products and technologies. In efficiency-driven economies, financial intermediation supports entrepreneurship by providing the requisite financial framework for business establishment and growth. There is a positive relationship between the level of development of the financial system and the entry of new firms in these economies, given that these firms can enhance productivity owing to improved access to financial services. These include loans, credit lines, and other financial products essential for the entrepreneur's operational expansion. The reduction of transaction and information costs by financial intermediaries as well as improved access to funding enhances the efficiency of resource allocation resulting in increased entrepreneurial activity (Levine, 2005; Ayyagari et al., 2011). In resource-driven economies, financial intermediation supports entrepreneurship by enabling economic diversification and reducing dependency on natural resources. By providing access to credit and investment, financial intermediaries help entrepreneurs develop new industries and reduce the economy’s reliance on natural resources. Financial intermediaries support institutional development, which is essential for fostering entrepreneurship in resource-dependent economies. Effective financial intermediation mitigates the resource curse by promoting investments in non-resource sectors (Acemoglu et al., 2001; Beck & Levine, 2002). Thus financial intermediation influences entrepreneurship and a well-developed financial system elevates entrepreneurial activity and sustain growth in diverse economic contexts.

The significant coefficient of unemployment shows that unemployment is an important factor in stimulating entrepreneurship. This finding is in line with (da Fonseca, 2022) that finds that unemployment doubles the probability of an individual to start a business. This relationship implies that both variables have a dynamic influence on one another. On the

one hand, hiring by new business beginnings could lead to a decline in unemployment. Conversely, elevated unemployment rates could potentially stimulate entrepreneurship, as the opportunity cost of establishing a new business is reduced for the jobless. (Faria, (2015). Unemployment may push individuals to create new ventures and start their own businesses as a means of income generation and career development as an alternative to wage employment, especially in economies with a strong entrepreneurial culture and support systems as in innovation driven countries. Unemployed individuals in these economies may leverage their skills and knowledge to innovate and create new products or services (Audretsch, 1995). Additionally, during longer phases of elevated unemployment, people are forced to pursue alternative avenues of earning a living which is known as necessity-driven entrepreneurship. In innovation-driven economies, this has the potential to spawn novel startups, which could lead to additional employment opportunities and increased productivity (Thurik et al., 2008). It is also possible that unemployment enhances the level of entrepreneurial activity in the economy, as people try to improve their economic situations by starting businesses. In efficiency-driven economies, unemployed people are more likely to turn to self-employment as an alternative to wage employment. This transformation creates increased economic dynamism and diversification that enhances productivity and efficiency in established markets. By using their experience and knowledge from the industry, these entrepreneurs are able to create value-added resource and supply chain businesses, thereby optimizing their operations (Fritsch & Mueller, 2004; Acs & Varga, 2008). In resource-driven economies, unemployment may lead to increased entrepreneurship as individuals look to diversify their income sources away from resource-dependent sectors. High unemployment rates in resource-driven economies can spur individuals to explore entrepreneurial opportunities in non-resource sectors. This diversification is crucial for reducing economic dependency on natural resources and fostering long-term sustainable growth. Moreover, high unemployment can push individuals to innovate and start new ventures, contributing to economic diversification and resilience particularly in economies where alternative employment opportunities are limited, pushing individuals towards self-employment and business creation (Gylfason & Zoega, 2006; Baptista & Thurik, 2007; Naude, 2010). As unemployment has been the economic problem of almost all the countries of the world. Therefore, governments of all countries see entrepreneurship as a viable option and an alternate to wage employment because entrepreneurship gives dual benefit because of its counter-cyclical nature in response to

unemployment, on one side it helps to reduce unemployment on the other hand in case of success it creates more employment opportunities leading to economic diversification, productivity improvements, and innovation.

The significant and negative influence of rule of law and government effectiveness on entrepreneurship in full panel of selected countries is a surprising outcome which is against their typical positive connotations. This result shows that generally the perception of people regarding effectiveness of the government and rule of law is negative, as evidenced by their negative impact on entrepreneurship at the respective significance levels of 1% and 5%, which correspond with Friedman (2011), Aisen and Veiga (2013), Obaji and Olugu (2014), La Porta & Shleifer (2014), Guerrero et al. (2021) and Audretsch et al. (2022) who have demonstrated that entrepreneurial activities can be suppressed in environments where regulatory frameworks are either inefficiently implemented or excessively stringent. On the other hand, this finding contradicts with numerous studies that contend that they generally have a positive impact on entrepreneurship by establishing a stable environment (For instance Acemoglu & Johnson, 2005; Rodriguez-Gulias et al., 2018; Ajide, 2022). The negative influence on entrepreneurship, despite their typically positive connotations, can be explained through the mechanisms of overregulation, focus on established businesses, risk aversion, and crowding out by government activities etc. Overregulation and bureaucratic hurdles, often a byproduct of highly effective governments, can stifle entrepreneurial activities by increasing the cost and complexity of starting and operating businesses (Djankov et al., 2002). Also, effective governments may focus on large firms and established industries because of their impact on key economic indicators like employment, creating policies that benefit entrenched firms rather than new entrants (Fogel et al., 2008). Under strong rule of law, people may consider the opportunity cost of entrepreneurial activity too high relative to the available jobs at established private companies or government agencies (Baumol, 2003). In addition, effective governments may also engage in direct economic activities through state-owned companies or notable public sector employment which in turn tend to stifle private entrepreneurial activities (Shleifer \& Vishny, 1994). In innovation-driven economies, these excessive regulations aimed at safeguarding intellectual property rights and enforcing high standards of business practice may stifle the entry of new firms, although in efficiency-driven economies, there tends to be rigid market structures where well-established firms bargain hard against new entrants

(Edwards, 2021). In resource-driven economies, strong regulatory regimes designed to effectively administrate resource wealth often stifle entrepreneurial activity in non-resource activities by imposing excessive regulatory burdens (Auty, 2001).

4.2.4. Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth

The purpose of this section is to look at how entrepreneurship affects mediation in association of financial intermediation with growth of the innovation-driven economies. Moderated mediation approach, as described by Muller et al. (2005) is used to achieve the objectives. Structural equation modeling (SEM) is utilized to estimate all regression models simultaneously, allowing for an in-depth understanding of the interrelationships among these variables (Awang, 2014).

4.2.4.1. Structural Equation Modeling (SEM)

Table 4.4 displays the structural equation modeling results.

Table 4.4: Structural Equation Modeling

	Coefficient	Standard Error	Z	p-value
Structural				
lnEG ←				
lnENT	.718	.057	12.55	.000
lnFI	.051	.007	7.40	.000
lnPE	.386	.011	35.16	.000
lnI	.492	.013	36.58	.000
HD	.109	.081	1.35	.176
Cons	2.208	.054	40.80	.000
lnENT ←				
lnFI	.283	.021	13.00	.000
lnUN	.624	.026	23.99	.000
GE	-.601	.097	-6.18	.000
RL	-.508	.088	-5.78	.000
Cons	-.437	.315	-1.39	.166

LR test of model vs. saturated: $chi^2(6) = 1324.32$, Prob > $chi^2 = 0.0000$

Table 4.4 presents the estimation results from Structural Equation Modeling (SEM) when Entrepreneurship (Ent) is included as a mediator. The regression models are estimated simultaneously and the associations among variables are examined at the same time. The p-values indicate the significance levels of the estimated relationships.

The findings of the structural equation modeling (SEM) demonstrate that financial intermediation positively impacts economic growth at 1% and the coefficient 0.051 is representing the direct impact. Simultaneously, financial intermediation also impacts

entrepreneurship positively with p-value 0.000 and this direct impact is depicted by its coefficient 0.283. These results align with the findings of Dutta and Meierrieks (2021) and Konstantakopoulou (2023). The prior discussion in the above sections has effectively explained the relationship between financial intermediation and its direct influence on both economic growth and entrepreneurship. Financial intermediation promotes the effective distribution of resources by directing funds from those who save to individuals who borrow, hence encouraging investment and economic transactions. In countries, where entrepreneurs face challenges in accessing financial resources, the implementation of efficient financial intermediation can significantly contribute to the development of enterprises. The findings clearly demonstrate that the impact of entrepreneurship is positive on economic growth having a p-value 0.000 and the coefficient 0.718 is representing this impact through the promotion of innovation, job creation, and increased competition. These findings are consistent with Kim et al. (2022). By introducing new goods and services, entrepreneurs foster economic growth through innovation which increases productivity and efficiency in an economy. Acs et al. (2013) discusses the importance of entrepreneurship in economic growth particularly with regard to creating employment opportunities and stimulating economic development. Entrepreneurs foster economic activity and enhance growth rates by creating new industries and increasing competition. The overall results of SEM support the GMM findings, but the change in human development estimate in the SEM results is the only difference between SEM and GMM. In GMM, human development is positively and meaningfully productive; however, when entrepreneurship is factored as a mediator, the impact of human development is positive but not significant with p-value 0.176. The change in the significance and impact of human development in question can be explained by multiple reasons, many of which are interlinked. One fundamental rationale is the mediation of entrepreneurship which tends to function as a medium through which human development facilitates economic growth. Human development in terms of education and health supports adequate entrepreneurial activities by ensuring a vigorous and adequately educated population. When entrepreneurship is incorporated within the framework, it captures the human development impact indirectly, which in turn renders the direct impact insignificant. This aligns with Acs et al. (2009), who argue that entrepreneurship complements human capital and the absorption and utilization of human capital through entrepreneurial ventures are crucial. In innovative and efficiency-driven economies, financial intermediation efficiently allocates resources to entrepreneurial activities,

maximizing the utilization of human capital. Baumol (2003) suggests that the allocation of talent to productive entrepreneurial activities is essential for economic growth. The Knowledge Spillover Theory, also supports the view that entrepreneurship facilitates the spillover of knowledge created by human capital, leading to innovation and growth (Acs et al., 2009). This spillover might explain why the direct impact diminishes when entrepreneurship is taken into account. Additionally, the contextual differences among the eighty four countries in the panel, which include a mix of innovation-driven, efficiency-driven, and resource-driven economies, play a significant role. In innovation-driven economies, high levels of human development are typically associated with advanced entrepreneurial ecosystems, making the impact of human development more pronounced through entrepreneurship (Porter, 1990). In contrast, in efficiency-driven and resource-driven economies, there might be a less direct association of human development with economic expansion. For instance, in resource-driven economies, economic growth often relies more on natural resources than on human development or entrepreneurship (Auty, 2001). The interaction between the three variables is complex and multifaceted and the incorporation of entrepreneurship as a mediator variable changes the nature of these relationships.

4.2.4.2. Testing Mediation

The mediation analysis is conducted by employing a methodology proposed by Baron and Kenny (1986) and Kenny (2024). This methodology involves three fundamental procedures, as described in Chapter 3, which are necessary for showing mediation. Table 4.5 shows the findings of mediation analysis.

Table 4.5: Baron and Kenny approach & Sobel's Test

Estimates	Delta	Sobel
Indirect effect	.020	.020
Std. Err.	.002	.002
z-value	9.027	9.027
p-value	.000	.000
Conf. Interval	.016 , .025	.016 , .025

STEP 1: lnENT:lnFI (X → M); β=0.284 ; p=0.000
STEP 2: lnEG:lnENT(M → Y); β =0.072 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.051 ; p=0.000
All the three steps and the Sobel's test are significant, therefore the ***Mediation is Partial***

Table 4.5 presents the indirect effect of financial intermediation (FI) on economic growth (EG) through the mediating role of entrepreneurship (Ent) by reporting the three steps of Baron and Kenny approach. The significance of this mediation is evaluated using Sobel's test, with p-values indicating statistical relevance.

It is evident from the result that the coefficient 0.051 represents the financial intermediation's direct impact on economic growth. The significant effect having p-value 0.000 refers that this effect has to be mediated. It is also apparent that the direct impact of financial intermediation on entrepreneurship is 0.284 represented by its coefficient. It is also apparent entrepreneurship's impact on economic growth in 0.072 having p-value 0.000. Therefore, Economic growth and Entrepreneurship may be associated due to the confounding effect of financial intermediation, which influences both the variables. It is found that the influence or effect of financial intermediation diminishes after incorporating the entrepreneurship in the model because a portion of the effect has been transferred through the entrepreneurship. This means that in the first instance financial intermediation impacts the entrepreneurship and then entrepreneurship impacts the economic growth. The indirect effect is 0.020 i.e. (0.284 x 0.072) which has been reduced and thus providing an evidence of partial mediation. As all the three steps of Barron and Kenny approach are significant and the direct effect has been reduced therefore entrepreneurship partially mediates the link between financial intermediation and economic growth.

4.2.4.3. Validating Mediation through Sobel's Test

To validate the outcomes of mediation, Sobel's (1987) z-test is utilized to evaluate the statistical significance of the mediation effect. It is inferred from the Table 4.5 that the z-value calculated from Sobel's test is 9.027 which is greater than ± 1.96 and is also significant with p-value 0.000 so it is confirmed that the mediation is significant.

4.2.4.4. Validating Mediation through Zhao's Test

For further confirmation of the statistical significance of the mediation effect, an approach proposed by Zhao et al. (2010) is applied. The results of this approach are illustrated in the Table 4.6.

Table 4.6: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.020	.020
Std. Err.	.002	.002
z-value	9.027	9.098
p-value	.000	.000
Conf. Interval	.016 , .025	.016 , .025

STEP 1- lnEG:lnFI (X → Y) with β =0.051 and p=0.000

As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation ***(Partial Mediation)***

Table 4.6 presents the mediating role of entrepreneurship(Ent) between financial intermediation(FI) and economic growth(EG) by reporting the steps of Zhao, Lynch & Chen's approach. The significance of this mediation is evaluated using Monte Carlo test, with p-values indicating statistical relevance.

It is apparent from the results shown in the Table 4.5 that the indirect effect is 0.020 which is positive and is in the same direction as of direct effect which is 0.051. Moreover, the Monte Carlo test is significant and confidence interval is not zero, therefore, mediating role of entrepreneurship is statistically significant.

4.2.4.5. Effect Size of the Mediation

The ratio of indirect effect to total effect (RIT) determines the effect size of mediation. RIT determines the proportion of the effect of the financial intermediation on economic growth that is mediated by entrepreneurship, whereas, the ratio of indirect effect to direct effect (RID) determines its magnitude. Table 4.7 displays the results of RIT and RID.

Table 4.7: Effect Size of the Mediation

Ratio of indirect effect to total effect		
RIT	=	(Indirect effect / Total effect) (0.020 / 0.072) = 0.285
Ratio of indirect effect to direct effect		
RID	=	(Indirect effect / Direct effect) (0.020 / 0.051) = 0.398

Table 4.7 reports the effect of mediation and its magnitude by calculating the ratio of indirect effect to total effect (RIT) and ratio of indirect effect to direct effect (RID)

It is inferred that the value of RIT is 0.285, illustrating that 29 % of financial intermediation's impact is transmitted through entrepreneurship on economic growth, whereas the value of RID suggests that the mediated effect is 0.4 times large then the direct effect.

The purpose of this research is fulfilled by ascertaining that entrepreneurship mediates the relationship of financial intermediation the economic growth on a global scale. The observed partial mediation reveals that entrepreneurship does indeed serve as a significant mediator in this relationship. The concept of partial mediation is more logical and occurs only when all of the aforementioned procedures are met (Baron and Kenny, 1986).The findings imply that relying alone on financial intermediation is insufficient for maximizing economic growth; it must be supplemented with entrepreneurial activities. This outcome demonstrates that financial intermediation supports economic growth not only through direct mechanisms such as capital allocation and financial stability but also significantly through fostering entrepreneurial activities. These entrepreneurial activities, in turn, drive innovation, efficiency, and diversification, leading to sustained economic growth in diverse economies. As noted by Van Rijnsoever (2022), financial intermediation is crucial for fostering the entrepreneurial ecosystem in innovation-driven economies because it finances innovative firms, particularly startups, for their capital-intensive R&D and technological investment needs. The RIT value indicates a considerable portion of direct effect is captured through entrepreneurial activities that foster innovation, productivity, generation of new industries, and hence, economic expansion. RID value further reaffirms strong entrepreneurial dominance while underscoring direct financial intermediation impacts, like better capital distribution and risk reduction, which remain important as well (Dutta & Meierrieks, 2021). Efficiency-driven economies gain from financial intermediation as productivity and the optimization of production processes improve in these economies because financial institutions offer streamlined access to capital, allowing firms to modernize technologies and increase operational efficiencies (Feyen et al., 2023). The mediation effect that is captured by an RIT suggests that there is an essential role played by entrepreneurship in the conversion of finances into an economically productive activity. Entrepreneurs, in a bid to gain, change the financial resources into economic essentials by innovating cost-saving measures and improving net competitive advantage in the market. The RID value points to the mediated impact of entrepreneurial activities which suggests that as financial intermediation improves economic efficiency, it is entrepreneurial activities that drive productivity and growth (Burchi et al., 2021). In resource driven economies, financial intermediation is highly instrumental in ensuring that economic activities are de-centered from the extraction of natural resources as it provides funding for businesses in non-resource sectors, thus lessening the reliance on the natural resources and advancing

ecofriendly sustainable development (Konstantakopoulou, 2023)). The RIT suggests that the mediating role of entrepreneurship in growth of the economy ensures diversification of the economy, and the RID suggest that it is important in the generation of new fields and opportunities in the economy (Schumpeter, 1934).

These results from the mediation analysis prove clearly that entrepreneurship mediates strongly in different economies in the world. This emphasizes the impact of mediation that distinctly demonstrates the significance of entrepreneurship in leveraging capital to spur economic development.

4.3. Analysis of Innovation Driven Countries

This part aims to analyze, with a panel of twenty eight countries labeled as innovation driven by GEM, whether entrepreneurial activity mediates the relationship between financial intermediation and economic growth. Economies driven by innovation are at the highest point of the economic development pyramid. These economies are undergoing significant growth in the services industry because firms are shifting towards knowledge-based services. Innovation driven countries are more likely to be the ones whose entrepreneurs create businesses stemming from new technologies or ideas backed by high levels of R&D spending. These countries also tend to provide an enabling environment for entrepreneurship through framework policies designed to enhance innovation and provide capital for business formation and development (El Ghak et al., 2021). The same three models that were employed in the previous section and described in chapter three are employed to comprehend this nexus in countries that are innovation-driven.

4.3.1. Descriptive Statistics

The descriptive statistics for innovation-driven countries disclose important distributional properties of the key variables used in the analysis. The table 4.8 provides descriptive statistics for panel data of 28 innovation driven countries spanning over 25 years. The number of observations varies due to missing values in some variables and is specified against each variable.

In upper panel of the table 4.8, the descriptive statistics of the original dataset show variability and non-normality across multiple variables. Economic Growth (EG) is real GDP in terms of US Dollars has an abnormally high standard deviation, as well as substantial positive skewness (3.44) and kurtosis (14.85), indicating the prevalence of extreme values, which is common in macroeconomic data due to wide variations in GDP estimates between countries. The figures for entrepreneurship (ENT) and financial intermediation (FI) also show variation in the data. Entrepreneurship has a right-skewed distribution and an elevated kurtosis value, indicating that while most observations are on the low end, a few countries report very high values. The data show variance in both investment (I) and public expenditure (PE). Investment has considerable skewness and kurtosis, indicating some asymmetry and peakedness in the distribution. Human

Development (HD) exhibits negative skewness and high kurtosis, indicating a concentration of higher HDI values with a few low outliers. Furthermore, government effectiveness (GE) and rule of law (RL) are negatively skewed, implying that most countries do relatively well, with fewer observations indicating poor institutional quality. Overall, the distributional properties of these variables in the upper panel emphasize the need of transformation and standardization in ensuring the validity of statistical analyses, particularly in meeting the assumptions of normalcy and comparability across scales.

Table 4.8: Descriptive Statistics (Innovation Driven Countries)

Descriptive Statistics before Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
EG (Billion USD)	695	1720	20000	18.1	3440	3.444	14.847
ENT	700	17.575	64.32	2.94	10.176	2.234	8.964
FI	591	103.554	221.288	0.186	44.372	0.169	2.317
I	669	23.992	44.518	14.751	5.220	1.495	6.046
PE	663	18.524	27.935	8.759	4.165	-0.244	2.543
UN	700	6.904	26.09	1.64	3.751	1.732	6.955
HD	669	0.867	0.957	0.554	0.067	-0.499	4.705
GE	700	1.356	2.436	-0.348	0.590	-0.542	2.463
RL	700	1.248	2.129	-0.639	0.662	-0.979	3.247
Descriptive Statistics after Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
lnEG	695	26.996	30.625	23.618	1.539	0.150	2.753
lnENT	700	14.182	19.894	10.791	1.782	0.142	4.792
lnFI	591	26.911	31.273	18.049	1.901	-0.363	3.262
lnI	669	25.548	29.442	22.139	1.568	0.202	2.797
lnPE	663	25.281	28.657	21.875	1.538	0.626	2.538
lnUN	700	13.322	17.421	10.354	1.540	0.667	2.981
HD	669	0.867	0.957	0.554	0.067	-0.499	4.705
GE	700	1.356	2.436	-0.348	0.591	-0.542	2.463
RL	700	1.248	2.129	-0.639	0.662	-0.979	3.247

Table 4.8 presents the descriptive statistics for the variables used in the panel analysis of innovation driven countries. The table includes the number of observations (Obs), mean, standard deviation (Std. Dev), minimum (Min), maximum (Max), skewness (Sk), and kurtosis (K) for each variable.

The lower panel of the table 4.8 displays the descriptive statistics after transformation and post-standardization. The variables economic growth (lnEG), entrepreneurship (lnENT), financial intermediation (lnFI), and other control variables apart from index-based measures have been standardized as detailed in section 3.8 of variable description and log-transformed to ensure consistency in scale and meet the normality assumption. The average value of economic growth (lnEG) is 26.996, ranging between 23.618 and 30.625, with a standard deviation of 1.539, indicating moderate variation. Entrepreneurship (lnENT) has a mean of 14.182 and shows a relatively wide range from 10.791 to 19.894, with a standard deviation of 1.782. Financial intermediation (lnFI) has a mean of 26.911, a standard deviation of 1.901, and spans values from 18.049 to 31.273. Investment (lnI) and public expenditure (lnPE) exhibit means of 25.548 and 25.281, respectively, with

standard deviations close to 1.5, reflecting consistency across innovation-driven countries. Unemployment (lnUN) has a mean value of 13.322 and a standard deviation of 1.540. Human development (HD) shows a high average of 0.867 with minimal dispersion (SD = 0.067), while governance indicators such as government effectiveness (GE) and rule of law (RL) show means of 1.356 and 1.248, respectively. These variables also display moderate skewness and kurtosis values, suggesting acceptable levels of symmetry and distributional shape, with all skewness values falling within ±1 and kurtosis ranging from 2.463 to 4.792. This descriptive profile suggests a stable and well-structured dataset, suitable for robust econometric analysis in innovation-driven economies.

4.3.2. Effect of Financial Intermediation on Economic Growth

This section presents estimates for the first model that looks into how financial intermediation affects economic growth in nations that prioritize innovation. SEM requires this effect to be statistically significant. To address econometric issues like heterogeneity and endogeneity, panel data approaches are utilized to ensure accuracy and reliability of the results. This study uses POLS, RE, FE, and GMM, however, as explained in the section 4.2.2, GMM results are more reliable and robust in addressing potential biases that can affect other methods, making it a better choice for interpretation of results. The findings of all methodologies are shown in table 4.9 below, but this study relies on GMM, thus the results of GMM are interpreted for the reasons above.

Table 4.9: Effect of Financial Intermediation on Economic Growth

	Pooled OLS	Random Effect	Fixed Effect	GMM
Variables	LnEG	lnEG	lnEG	lnEG
lnFI	.079***	.006	.005	.05***
	(.027)	(.008)	(.01)	(.013)
lnI	.518***	.302***	.246***	.259***
	(.053)	(.034)	(.035)	(.017)
lnPE	.381***	.566***	.447***	.574***
	(.048)	(.040)	(.06)	(.019)
HD	.112	.567*	2.202***	.430***
	(.262)	(.307)	(.618)	(.098)
Cons	1.884***	4.274***	7.336***	4.227***
	(.358)	(.622)	(.979)	(.202)
Observations	587	587	587	527
Countries	28	28	28	28
Hansen Test	.223		AR(1)	.026
Wald Test	.003		AR(2)	.991

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.9 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Economic Growth (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and private investment (I), public expenditure (PE), and human development (HD) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

Table 4.9 shows that financial intermediation affects economic growth differently across the methodologies. This variation may be due to how these models deal for unobserved heterogeneity and endogeneity. Although Pooled OLS shows a positive association, it may be unreliable due to omitted variable bias and ignoring individual variability. RE suggests no relationship when individual impacts are random and uncorrelated with predictors. It may imply an invalid random effects assumption. FE also shows that the association is insignificant after adjusting for individual effects. This could indicate that financial intermediation has no individual impact over time or that fixed effects absorb the variation. Since GMM handles endogeneity and dynamic interactions better, the significant positive impact here suggests a more reliable outcome, addressing biases that other approaches may have. Moreover, GMM results are more robust in terms of coefficient sizes, and significance level. Hansen test with 0.223 p-value suggests that the GMM model's instruments are valid and appropriate. In this study, instruments are constructed using the second to fourth lags of the independent and control variables. While the Cragg-Donald test is not applicable in GMM, instrument strength is assessed through first-stage results and Wald F-statistics, which consistently exceed the threshold of 10. This suggests the instruments are strong and not prone to weak identification

issues. Strong instruments are correlated with the endogenous variables and uncorrelated with the error term, ensuring reliable estimation. The positive results of the Hansen and Wald tests further confirm the validity and strength of the instruments used. The p-value 0.026 of AR(1) implies first-order autocorrelation in the residuals but there is no evidence of second-order autocorrelation, which is good because the p-value of AR(2) is 0.991. It also validates the appropriateness of model's lagged instruments. The explanatory factors appear to be jointly significant and provide a good explanation for the dependent variable in the model, as indicated by the Wald test's p-value of 0.003.

GMM results show that financial intermediation's impact is positive on economic growth which is supported by Yakubu et al. (2021), Yakubu and Abdallah (2021), Konstantakopoulou (2023), Ramesh and Guruprasad (2024), and many other studies that investigate how this relationship works in various economies. Advanced financial development fosters innovative ecosystems in countries that emphasize innovation. Switzerland, the world's most innovative country, has strong banking institutions, broad financial markets, and robust legislative frameworks for innovation and entrepreneurship, according to the Global Innovation Index 2022. Sweden also possesses a robust financial system, including widespread credit and financial services. This finance infrastructure benefits the country's startup and research and development activities. Chinese fintech and digital infrastructure has expanded dramatically. This expansion has fueled Chinese technological and industry innovation (Dutta et al., 2022). According to the Global Financial Development Report 2019/2020, the United States' highly developed financial sector has deep capital markets, extensive credit access, and ample venture capital, all of which are critical for technology and biotech leadership. London's reputation as a global financial hub, combined with the UK's sophisticated financial sector, provides a diverse range of financial instruments as well as a supportive regulatory framework for innovation and entrepreneurship. The Netherlands' robust banking industry and fintech ecosystem contribute to its strong innovation environment (World Bank, 2019). These examples show that advanced financial development, depth, access, efficiency, and stability is critical to innovation and economic success. Countries with robust financial sectors encourage technology, R&D and commercialization, positioning them as global innovation leaders. Innovative economies typically feature industries that rely heavily on foreign capital and profit from financial development (Aghion et al., 2005; Beck et al., 2007). Well-functioning financial institutions contribute to economic growth in

innovative economies. A one percentage point rise in financial intermediation boosts economic growth by 0.05 percentage points, illustrating its considerable positive impact on economic growth.

The statistical significance of investment at the 1% level suggests a strong positive influence on economic growth, which corroborates with Trpeski and Cvetanoska (2019) and Kong et al. (2020). This is because an increase in investment leads to the expansion of productive capacity, which eventually enhances productivity and contributes favorably to economic growth. Countries that focus on innovation require investments in R&D, infrastructure, and high-tech companies for sustained growth. Innovation drives growth through a process known as creative destruction. This process boosts economic production and productivity by replacing outdated technologies with newer ones. A competitive edge in these economies is attained through the constant release of more sophisticated and enhanced goods or services, which require substantial funding in human capital, infrastructure, and technology (Del-Aguila-Arcentales et al., 2023). A positive effect of investment highlights the importance of capital accumulation for sustaining growth.

At 1% significance level, the findings indicate a positive correlation between public expenditure and economic growth. Several empirical studies corroborate this analysis by demonstrating the impact of public expenditure on fostering economic growth (Keynes, 1936; Romer, 1986; Barro, 1990; Devarajan et al., 1996; Perotti, 2007; Becker, 2009). Public expenditures promote economic growth by spending on infrastructure investment, human capital development, research and development (R&D), creation of social safety nets, macroeconomic stabilization, and strengthening of institutional frameworks. In innovation-driven economies, public expenditures focus on R&D, education, and infrastructure, which are vital for advancing technical innovation and sustaining competitive advantage. Government support enhances R&D and innovation, and in turn, private sector innovation by correcting market failures resulting from excessively risky research. Public expenditure on innovation and technology drives and accelerate significant advancement which leads to economic growth (Aghion et al., 2009; Mazzucato, 2011). Public expenditure guides the development of technologies, improves productivity, increases diversification, which all stimulate economic growth.

Human development's effects on economic growth vary by how each method deals with unobserved heterogeneity and endogeneity. The Pooled OLS model's insignificant coefficient for human development (HD) shows omitted variable bias, as it does not account for country-specific impacts. The RE model accounts for these effects and yields a positive coefficient for HD at the 10% significance level, implying a more accurate but still imprecise estimate. The FE model, which accounts for all time-invariant country differences, yields positive coefficient, indicating significant intra-country variation in HDI over time. The GMM model, which addresses endogeneity through instrumental factors, yields a more realistic value. This implies that, after controlling for endogeneity, human development exhibits a substantial positive impact of growth of the economy. This positive association matches Fatah et al. (2012) and Grubaugh (2015). Improvements in education, health, and per capita income boost productivity and economic growth. A highly educated, skilled, and healthy workforce is more productive, innovative, and involved in research and development, which advances technology and leads to economic prosperity. Higher levels of human development lead to quicker economic growth, emphasizing the feedback loop where economic growth promotes further human development improvements (Ranis et al., 2000). For sustainable economic growth, innovation-driven economies need a well-educated and healthy population to progress technology, boost productivity, and diversify the economy (Miskiewicz-Nawrocka, 2020).

4.3.3. Effect of Financial Intermediation on Entrepreneurship

Using the second model, this section looks at how financial intermediation directly affects entrepreneurship in countries that are driven by innovation. This direct effect must be statistically significant for SEM to be applicable. In order to be certain that the outcomes are accurate and trustworthy, panel data approaches have been used to address econometric problems such as endogeneity and heterogeneity. This analysis employs POLS, RE, FE, and GMM; however, as described in section 4.2.2, GMM results are more dependable and robust in mitigating potential biases that may impact other methods, rendering it a superior option for the interpretation of results. Table 4.8 displays the results of all methodologies; however, this study relies on GMM, and hence, the results are interpreted in accordance with the aforementioned reasons. The Hansen test, with a p-value of 0.467, confirms the suitability and validity of instruments used in GMM. The

instruments are derived using the second to fourth lags of both the independent and control variables. Although the Cragg-Donald test does not apply to GMM, instrument strength is evaluated using first-stage outcomes and Wald F-statistics, which consistently remain above the accepted threshold of 10. This indicates that the instruments are strong and free from weak identification concerns. Strong instruments maintain a close link with the endogenous variables while remaining uncorrelated with the error term, supporting reliable estimation. The favorable results of the Hansen and Wald tests further support the validity and robustness of the instruments applied. The residuals show evidence of first-order autocorrelation, as indicated by the p-value of 0.021 for the AR(1). However, the p-value of 0.374 for AR(2) indicates that there is no evidence of second-order autocorrelation. This is a positive finding. It also verifies the suitability of the model's lagged instruments. The p-value 0.01 of the Wald test shows that the explanatory factors are collectively significant and effectively explain the dependent variable in the model.

Table 4.10: Effect of Financial Intermediation on Entrepreneurship

	Pooled OLS	**Random Effect**	**Fixed Effect**	**GMM**
Variables	lnEnt	lnEnt	lnEnt	lnEnt
lnFI	.266***	.075***	.05***	.25***
	(.022)	(.011)	(.015)	(.037)
lnUN	.798***	.121***	.039**	.151**
	(.024)	(.018)	(.019)	(.062)
GE	.351***	-.169***	-.186***	-.37***
	(.103)	(.035)	(.038)	(.082)
RL	-.938***	.046	.186***	.361***
	(.093)	.051	(.071)	(.117)
Cons	-2.942***	10.446***	12.161	5.36***
	(.353)	(.363)	(.511)	(1.086)
Observations	608	608	608	532
Countries	28	28	28	28
Hansen Test	.467		AR(1)	.021
Wald Test	.01		AR(2)	.374

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.10 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Entrepreneurship (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and unemployment (UN), government effectiveness (GE), and rule of law (RL) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

The findings clearly reveal that financial intermediation's impact is positive on entrepreneurship at the 1% significance level in innovation-driven countries which are corroborated with Ajide (2020) and Dutta and Meierrieks (2021), This is also aligned with the Schumpeterian entrepreneurial theory which states that financial means are

essential for fostering innovation and progress in the economy (Schumpeter, 1911). In innovation driven economies, the availability of financial capital is critical for business endeavors that entail heavy spending on research and development aimed at supporting innovative projects that, if successful, could offer substantial returns. Such countries are well organized and possess a strong financial system that funds new product and technology introducers which places such economies at the forefront in terms of patent filings cementing their commitment to the continuous technological and innovative advancement (Demirguc-Kunt et al., 2020). Innovation driven countries had the largest share of patent applications contributing to a total of 3.46 million patents applied for worldwide in 2022 (WIPO, 2023). China remains patent hegemon, dominating the global patent filing with over 1.58 million patent applications in 2022, both domestically and internationally. This marked a year-on-year increase of 3.1%, primarily driven by resident filings. The United States followed with 505,539 applications, showing a 1.1% growth. Japan also preserved its reputation as a major inventor with 405,361 applications. Presence from Germany was extensive as well, with 155,896 applications. In general, the substantial patent activity in these countries reflects robust innovative frameworks supported by a well-structured and multi-faceted capital market alongside considerable investments in research and development (Dutta et al., 2023). These patterns highlight the pivotal functions of financial intermediation in fostering new business opportunities in countries with innovation-based economies and maintaining competitiveness on a global scale.

The positive impact of unemployment on entrepreneurship at the 1% significance level suggests that this is a very important determinant of entrepreneurial activity. This aligns with da Fonseca (2022) who assesses that unemployment factors doubles the odds of someone starting a business. While unemployment tends to foster necessity-based entrepreneurship, it can also foster opportunity-based entrepreneurship, particularly in more developed economies with strong support systems for entrepreneurs. Unemployed individuals with the right expertise and experience may seek unconventional jobs view traditional employment openings as waiting in line to capitalize on untapped market opportunities (Audretsch, 1995). Innovation-driven economies are most affected by this because a solid financial and institutional infrastructure positively affects the transformation of perceived opportunities into business ventures (Bosma et al., 2008). Therefore, unemployment may motivate people to start new businesses as a replacement

to wage work, which increases economic diversification and innovation. However, it can also result in opportunity-driven entrepreneurship. In these economies, entrepreneurship is perceived as a counter-cyclical instrument that not only facilitates unemployment reduction but also generates additional employment opportunities and stimulates economic expansion (Faria, 2015).

The association of Government Effectiveness and entrepreneurship in innovation-driven economies offers an unusual perspective at how governance affects entrepreneurship. Since the Government Effectiveness and Rule of Law indices are dependent on perceptions, their relationship with entrepreneurship in innovation-driven economies is particularly interesting. At 1% significance, government effectiveness negatively affects entrepreneurship in a panel of innovation-driven countries, contrary to the general consensus. This surprising result is supported by multiple studies (e.g. Friedman, 2011; Aisen & Veiga, 2013; Obaji & Olugu, 2014). This outcome is a reflection of how the entrepreneurs perceive the government's dedication to certain programs, the effectiveness of public services, the legitimacy of the government's pledge to carry out specific policies and the degree of political influence-freedom enjoyed by the civil service. The entrepreneurs often associates government effectiveness with a well-functioning bureaucracy. However, businesses, especially those starting out, may perceive this as an overwhelming bureaucratic red tape and regulatory burden (La Porta & Shleifer, 2014; Guerrero et al., 2021). Complex rules and procedural delays can dissuade people from launching new firms because they seem time-consuming and expensive. When the entrepreneurs view the government as effective, they may believe it prioritizes established businesses that contribute to economic stability and growth over startups and small businesses (Fogel et al., 2008; Audretsch, 2022). In contrast, at 1% significance, the Rule of Law index positively affects entrepreneurship in a panel of innovation-driven countries. This is supported by (Acemoglu & Johnson, 2005; Rodriguez-Gulias et al., 2018; Ajide, 2022) that rule of law reduces transaction costs, protects property rights, and creates a stable climate for entrepreneurship. This inference is consistent with how the general public in these economies views crime and violence as well as people's faith in and adherence to the laws of society, particularly those pertaining to property rights, contract enforcement, the police, and the courts. The people believe that a strong rule of law protects property rights and enforces contracts, which entrepreneurs need. People

spend more in new businesses when they believe their intellectual property and business contracts are protected by legislation. Public view of a fair and predictable legal environment decreases business risks and encourage entrepreneurship (Ajide, 2022).

4.3.4. Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth

The purpose of this section is to look at how entrepreneurship affects mediation in association of financial intermediation with growth of the innovation-driven economies. Moderated mediation approach, as described by Muller et al. (2005) is used to achieve the objectives. Structural equation modeling (SEM) is utilized to estimate all regression models simultaneously, allowing for an in-depth understanding of the interrelationships among these variables (Awang, 2014).

4.3.4.1. Structural Equation Modeling (SEM)

Table 4.11 displays the structural equation modeling results.

Table 4.11: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.042	.009	4.52	.000
lnFI	.085	.009	9.07	.000
lnPE	.372	.014	26.28	.000
lnI	.480	.018	25.90	.000
HD	.668	.146	4.56	.000
Cons	1.853	.105	17.64	.000
lnENT ←				
lnFI	.443	.026	17.25	.000
lnUN	.516	.033	15.59	.000
GE	-.048	.101	-.48	.628
RL	-.974	.085	-11.42	.000
Cons	-3.333	.328	-10.16	.000

LR test of model vs. saturated: $chi^2(6) = 457.67$, Prob > $chi^2 = 0.0000$

Table 4.11 presents the estimation results from Structural Equation Modeling (SEM) when Entrepreneurship (Ent) is included as a mediator. The regression models are estimated simultaneously and the associations among variables are examined at the same time. The p-values indicate the significance levels of the estimated relationships.

Financial intermediation's direct impact on economic growth is positive at 1% significance level, according to structural equation modeling (SEM) results. The direct impact is 0.085 as indicated by its coefficient. At 1% significance and a 0.000 p-value,

financial intermediation also has a favorable impact on entrepreneurship. The coefficient 0.443 shows the direct effect of financial intermediation on entrepreneurship. These findings match Dutta and Meierrieks (2021) and Konstantakopoulou (2023). Entrepreneurship positively affects growth of the economy at 1% significance with p-value 0.000. Entrepreneurship boosts innovation, job creation, and competition, boosting economic growth by 0.042. These findings match Kim et al. (2022) who also demonstrate that entrepreneurs create new products and services, which boosts economic development and efficiency. Entrepreneurship's role is also emphasized by Acs et al. (2013) particularly in creation of more jobs and technological advancement in the economy. Entrepreneurs create new markets and boost competition to boost economic growth.

The overall results of structural equation modeling (SEM) are consistent with findings of the GMM. The only variation in SEM results is acknowledged in terms of government effectiveness and rule of law. While investigating the financial intermediation's direct influence on entrepreneurship, a significant negative impact of government effectiveness whereas significant positive influence of rule of law is noted. However, when entrepreneurship is added as a mediator in structural equation modeling, the coefficient of rule of law becomes negative and has a significant influence on entrepreneurship (p-value 0.000), whereas government effectiveness is insignificant. This observed shift could be attributed to strong rule of law and successful governments in innovation-driven economies, which may prioritize established industries and large enterprises because of their significant contributions to economic stability and employment. Strict enforcement of rules may favor existing enterprises that can afford compliance expenses over new and smaller entrants that cannot. This can result in regulations that favor existing entities over new entrants and entrepreneurs, negatively impacting entrepreneurship (Fogel et al. 2008). Furthermore, efficient governments may engage directly in economic activities via state-owned firms or considerable public sector employment, pushing out private entrepreneurial endeavors (Shleifer & Vishny, 1994). As a result, the simultaneous inclusion of multiple variables in SEM, such as private investment and public expenditure, has the potential to distort computed coefficients and change significance levels for both variables. The SEM results show that the coefficients for private investment and public expenditure are 0.480 and 0.372, respectively, showing a strong impact in contrast to the coefficient for entrepreneurship, which is relatively weak (0.042). This implies that the good impact of the rule of law on entrepreneurship may be

mitigated and offset by other factors. As a result, the positive effects of the Rule of Law on entrepreneurship may be retarded by the complicated economic processes at work in the whole system. Furthermore, excessive regulatory scrutiny in these countries, which is designed to safeguard intellectual property and maintain high standards, can create hurdles to entry for new enterprises, undermining the benefits of a robust legal framework (Edwards, 2021). As a result, individuals may see entrepreneurship as having a higher opportunity cost than secure employment possibilities in established enterprises or the public sector (Baumol, 2003). As a result, the Rule of Law's considerable impact on entrepreneurship in SEM has shifted from positive to negative, which can be explained by complicated interactions and indirect impacts that reveal deeper economic dynamics. While the Rule of Law offers a stable and secure environment that is necessary for entrepreneurship, stringent enforcement may unintentionally decrease flexibility, create barriers for new firms, and interact with other factors in ways that reduce its positive influence.

4.3.4.2. Testing Mediation

The mediation analysis is carried out using a methodology proposed by Baron and Kenny (1986) and Kenny (2024). This technique includes three key steps, as detailed in Chapter 3, that are required for demonstrating mediation. Table 4.12 displays the findings of the mediation analysis.

Table 4.12: Baron and Kenny approach & Sobel's Test

Estimates	**Delta**	**Sobel**
Indirect effect	.018	.018
Std. Err.	.004	.004
z-value	4.372	4.372
p-value	.000	.000
Conf. Interval	.010 , .027	.010 , .027

STEP 1: lnENT:lnFI (X → M) ; β=0.443 ; p=0.000
STEP 2: lnEG:lnENT(M → Y) ; β =0.042 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.086 ; p=0.000
All the three steps and Sobel's test are significant, therefore the ***Mediation is Partial***

Table 4.12 presents the indirect effect of financial intermediation (FI) on economic growth (EG) through the mediating role of entrepreneurship (Ent) by reporting the three steps of Baron and Kenny approach. The significance of this mediation is evaluated using Sobel's test, with p-values indicating statistical relevance.

According to the findings, entrepreneurship partially mediates the association of financial intermediation with growth of innovation-driven economies, as all the three steps according to Barron and Kenny approach are significant and the financial

intermediation's effect has been reduced. The results show that the direct effect 0.086, significant at 1%, indicating that there is an effect that has to be mediated. It is also clear that the direct impact of financial intermediation on entrepreneurship is 0.443with p-value 0.000. Moreover, the significant direct impact of entrepreneurship on economic growth is 0.042. It is evident that the influence of financial intermediation has been reduced after including entrepreneurship into the model as a mediator because entrepreneurship also transfers some of the effect. Financial intermediation first affects entrepreneurship, which then affects economic growth, so the financial intermediation's indirect effect on economic growth through entrepreneurship is 0.018 (0.443 x 0.042), which has been reduced, indicating partial mediation.

4.3.4.3. Validating Mediation through Sobel's Test

Sobel's (1987) z-test is used to assess the statistical significance of the mediation effect in order to validate the mediation results. It is inferred from the Table 4.12 that the z-value calculated from Sobel's test is 4.372 which is greater than ± 1.96 and is also significant with p-value 0.000 so it is confirmed that the mediation is significant.

4.3.4.4. Validating Mediation through Zhao's Test

For further confirmation of the statistical significance of the mediation effect, an approach proposed by Zhao et al. (2010) is applied. The results of this approach are illustrated in the Table 4.13.

Table 4.13: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.018	.019
Std. Err.	.004	.004
z-value	4.372	4.261
p-value	.000	.000
Conf. Interval	.010 , .027	.010 , .027

STEP 1- lnEG:lnFI (X → Y) with β =0.086 and p=0.000
As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation **(Partial Mediation)**

Table 4.13 presents the mediating role of entrepreneurship(Ent) between financial intermediation(FI) and economic growth(EG) by reporting the steps of Zhao, Lynch & Chen's approach. The significance of this mediation is evaluated using Monte Carlo test, with p-values indicating statistical relevance.

It is apparent that the indirect effect is 0.018 which is positive and is in the same direction as of direct effect which is 0.086. Moreover, the significance of Monte Carlo test with p-value 0.000 and non-zero confidence interval confirms that the financial intermediation's indirect impact on economic growth through entrepreneurship's medium is statistically significant.

4.3.4.5. Effect Size of the Mediation

The ratio of indirect effect to total effect (RIT) determines the effect size of mediation. RIT determines the proportion of the effect of the financial intermediation on economic growth that is mediated by entrepreneurship, whereas, the ratio of indirect effect to direct effect (RID) determines its magnitude. Table 4.14 displays the results of RIT and RID.

Table 4.14: Effect Size of the Mediation

Ratio of indirect effect to total effect		
RIT	=	(Indirect effect / Total effect) (0.018 / 0.104) = 0.178
Ratio of indirect effect to direct effect		
RID	=	(Indirect effect / Direct effect) (0.018 / 0.086) = 0.216

Table 4.14 reports the effect of mediation and its magnitude by calculating the ratio of indirect effect to total effect (RIT) and ratio of indirect effect to direct effect (RID)

The value of RIT implies that mediation impact of entrepreneurship is approximately 18%. Similarly, the RID is 0.216, suggesting that the mediated effect of entrepreneurship is approximately 0.2 times larger than the direct effect. It means that entrepreneurship has a notable, but not dominant, impact on converting the advantages of financial intermediation into economic development. The GEM 2023/2024 Global Report reveals that TEA rate in the United States is approximately 16.5%. The United Kingdom has a TEA rate of about 10.2%, Germany's TEA rate stands at around 6.6%, Australia exhibits a TEA rate of 12.4%, Canada has a TEA rate of 14.7%, Sweden's TEA rate is around 8.7%, and Singapore reports a TEA rate of approximately 13.3%. These data highlight the diverse levels of entrepreneurial activity in various countries that prioritize innovation. The variations in TEA rates are impacted by factors like as governmental regulations, economic circumstances, cultural perspectives on entrepreneurship, and the accessibility of resources and support networks. Innovative countries have often registered impressive economic growth, marked by dominant activities of multinationals, large corporations, and mature industries. These firms usually have better availability of capital and tend to foster strong economic growth through their investment and invention activities. Both the government's efficiency in administering public policy and the functioning of the legal system turn out to impact negatively on entrepreneurship. This is probably because in more advanced economies, governments and financial markets typically serve older, larger industries and corporations, which are important for economic leadership, job creation, and domestic capital formation. Such focus may also result in the construction of financing systems that serve more advanced and larger developing entrepreneurial businesses (Fogel et al., 2008). In addition, the striving economies fueled by innovation commonly have complex and stringent regulatory systems designed to maintain high standards and protect patents which can stifle entrepreneurial initiative. In developed economies, markets can also be very crowded, which makes it difficult for new entrants

to find a niche where they can compete against more established competitors. This saturation diminishes the relative influence of new entrepreneurial activities on the level of economic growth (Edwards, 2021). In innovation-led economies, entrepreneurship may receive less attention than it did in earlier phases of economic progress when the creation of new businesses was important for diversification and economic growth. Furthermore, in advanced economies, the role of entrepreneurship shifts from being the principal driver of growth to a supportive role where it helps established firms through innovation and the development of niche markets. For any economy to experience growth, it is important that there is balanced support for both financial intermediation and entrepreneurship because of their impact, importance and interrelation.

The research convincingly illustrates the mediation impact of entrepreneurship which indicates that financial intermediation has a notable direct influence, while entrepreneurship acts as an accompanying factor by converting financial resources into innovative and economic endeavors specifically in economies driven by innovation. Nevertheless, it is crucial to strike a balance between the efficiency of government's programs and the adherence to the rules and Laws to ensure that they facilitate rather than impede entrepreneurial endeavors. This underscores the necessity for implementing policies that concurrently boost financial intermediation, government effectiveness, and entrepreneurial advancement in order to attain sustained economic growth in these economies.

4.4. Analysis of Efficiency-Driven Countries

This section aims to examine whether entrepreneurship acts as a mediator between economic growth and financial intermediation in a panel of twenty seven countries categorized as efficiency-driven countries by the GEM. Efficiency-driven economies are a transitional phase in economic development, marked by a competitive atmosphere brought about by enhanced product quality and streamlined production methods. At this stage, the government is primarily concerned with maintaining the efficient functioning of critical processes, such as effective marketplaces, strong higher education systems, productive product and labor markets, and technological preparedness. These economies undergo a shift from dependence on basic factor endowments, such as natural resources and low-cost labor, to achieve more efficiency in production and improve product quality in order to sustain their competitiveness. This phase is pivotal in establishing the foundation for long-term economic expansion and getting ready for the ultimate transition to an innovation-oriented economy, where cutting-edge technology and smart corporate strategies propel further progress (Smallbone et al., 2022). The same three models utilized in the previous section and illustrated in chapter three are utilized to examine this association in countries characterized as efficiency-driven economies.

4.4.1. Descriptive Statistics

The descriptive statistics for efficiency-driven countries provide a clear overview of the central tendencies and dispersion across the key variables. Descriptive statistics of original dataset for panel of 27 efficiency-driven nations spanning 25 years are presented in the upper panel of table 4.15. Each variable has a number of observations, which varies because some variables have missing values. With a mean of almost 467 billion USD and a wide range of 3.34 billion to 3.60 trillion USD, as well as a high standard deviation, Economic Growth (EG), which is real GDP expressed in billions of USD, shows differences in the sizes of the various nations. A distribution that is skewed to the right and dominated by a small number of large economies is indicated by the high positive skewness (2.392) and kurtosis (8.099). With a mean of 22.89 and a standard deviation of 14.21, as well as positive skewness (0.847) and kurtosis (2.784), entrepreneurship (ENT) indicates asymmetry and concentration of values across nations. With a mean of 70.30, a

substantial standard deviation of 49.57, right-skewness (1.167), and high kurtosis (4.356), financial intermediation (FI) suggests that some nations have particularly high levels of FI. Investment (I), which reflects heavy-tailed distribution and investment concentration in some nations, has a mean of 21.78 and is right-skewed (skewness = 1.519) with a high kurtosis (7.927). With a mean of 17.85, a minor negative skewness of -0.185, and a near-normal kurtosis of 2.065, the distribution of public expenditure (PE) is reasonably symmetric, indicating a more evenly distributed sample. A fraction of countries have severe unemployment, as evidenced by the unemployment rate, which varies significantly (mean = 9.57, SD = 6.95) and is heavily skewed to the right (1.407) with large tails (kurtosis = 4.386). The majority of the sample's countries score quite high on human development (HD), as evidenced by the high mean of 0.81, low dispersion, and somewhat negative skewness (-0.294). Both Rule of Law (RL) and Government Effectiveness (GE) show near-symmetric distributions with low skewness and kurtosis, indicating rather uniform institutional performance across nations.

Table 4.15: Descriptive Statistics (Efficiency Driven Countries)

Descriptive Statistics before Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
EG (Billion USD)	675	467	3600	3.34	740	2.392	8.098
ENT	675	22.888	61.59	4.68	14.212	0.847	2.783
FI	592	70.304	308.978	3.907	49.566	1.167	4.359
I	667	21.782	53.591	10.578	5.188	1.519	7.926
PE	636	17.851	30.003	8.043	4.843	-0.185	2.064
UN	675	9.573	33.29	0.21	6.946	1.406	4.385
HD	632	0.809	0.955	0.602	0.086	-0.294	2.069
GE	666	0.653	2.353	-1.088	0.835	0.218	1.928
RL	673	0.492	2.129	-1.271	0.951	0.136	1.672
Descriptive Statistics after Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
lnEG	675	25.791	28.911	21.929	1.596	-0.158	2.474
lnENT	675	13.653	16.965	9.567	1.849	-0.204	2.367
lnFI	537	25.174	28.806	20.906	1.841	-1.041	2.263
lnI	667	24.241	27.368	20.414	1.587	-0.149	2.417
lnPE	636	24.026	27.323	20.274	1.625	-1.013	2.397
lnUN	675	12.830	15.694	8.073	1.688	-0.526	3.031
HD	632	0.809	0.955	0.602	0.086	-0.294	2.069
GE	666	0.653	2.353	-1.088	0.835	0.218	1.928
RL	673	0.492	2.129	-1.271	0.951	0.136	1.672

This table presents the descriptive statistics for the variables used in the panel analysis of efficiency driven countries. The table includes the number of observations (Obs), mean, standard deviation (Std. Dev), minimum (Min), maximum (Max), skewness (Sk), and kurtosis (K) for each variable.

The descriptive statistics in the upper panel suggest that there is heterogeneity in the original dataset, therefore, all variables except index-based measures have been standardized to assure scale consistency, as specified in section 3.8 of the variable description. In addition, these variables have been log transformed to account for

skewness and meet the normality criterion. The lower panel of table 4.15 shows the descriptive statistics after transformation and post-standardization. Economic growth (lnEG) shows a mean of 25.791, with values ranging from 21.929 to 28.911 and a standard deviation of 1.596, reflecting moderate variability. Entrepreneurship (lnENT) has an average of 13.653, with values spanning from 9.567 to 16.965, and a standard deviation of 1.849. Financial intermediation (lnFI) records a mean of 25.174 and displays a broader distribution from 20.906 to 28.306, with a standard deviation of 1.841. Investment (lnI) and public expenditure (lnPE) have mean values of 24.241 and 24.026, respectively, with standard deviations around 1.6, suggesting consistent patterns across these countries. Unemployment (lnUN) averages 12.830, showing a range between 8.073 and 15.694. Human development (HD) is relatively high at 0.809 with a very low standard deviation of 0.086, while government effectiveness (GE) and rule of law (RL) present mean values of 0.653 and 0.492, respectively. The skewness (Sk) values for all variables lie between -1.041 and 0.218, and kurtosis (K) values range from 1.672 to 3.031, indicating reasonably symmetric and mesokurtic distributions, which are suitable for econometric modeling in the context of efficiency-driven economies.

4.4.2. Effect of Financial Intermediation on Economic Growth

In this part, the first model is used to assess the financial intermediation's direct impact on growth of efficiency-driven economies. For SEM to be applicable, this direct impact has to be statistically significant. To overcome any possible econometric problems such as heterogeneity and endogeneity, appropriate panel data techniques are used to ensure that the results are accurate and reliable. This study employs POLS, RE, FE, and GMM; however, as mentioned in Section 4.2.2, GMM results are more dependable and resilient in addressing potential biases that may affect other approaches, making it a better choice for interpreting results. The outcomes of all approaches are provided in table 4.16 below, but this study relies on GMM, hence the results of GMM are interpreted for the reasons stated above. Hansen test with 0.735 p-value suggests that the GMM model's instruments are valid and appropriate. The instruments in this analysis are based on the second to fourth lags of the independent and control variables. While the Cragg-Donald test is not applicable to GMM, the strength of the instruments is assessed through first-stage results and Wald F-statistics, which consistently exceed the benchmark value of 10. This suggests the instruments are strong and not affected by weak identification. Effective

instruments are closely related to the endogenous variables and uncorrelated with the error term, ensuring reliable estimates. The positive outcomes of the Hansen and Wald tests further confirm the validity and robustness of the instruments used. The p-value 0.049 of AR(1) implies first-order autocorrelation in the residuals but there is no evidence of second-order autocorrelation, which is good because the p-value of AR(2) is 0.329. It also validates the appropriateness of model's lagged instruments. The explanatory factors appear to be jointly significant and provide a good explanation for the dependent variable in the model, as indicated by the Wald test's p-value of 0.012.

Table 4.16: Effect of Financial Intermediation on Economic Growth

	Pooled OLS	**Random Effect**	**Fixed Effect**	**GMM**
Variables	lnEG	lnEG	lnEG	lnEG
lnFI	.05***	.01	-.015	.054***
	(.034)	(.021)	(.018)	(.021)
lnI	.572***	.259***	.242***	.225***
	(.018)	(.028)	(.025)	(.024)
lnPE	.383***	.519***	.289***	.484***
	(.019)	(.044)	(.050)	(.038)
HD	-.861***	.582*	2.49***	.493**
	(.093)	(.323)	(.364)	(.237)
Cons	2.166***	6.288***	11.317***	6.939***
	(.115)	(.678)	(.886)	(.38)
Observations	579	579	579	463
Countries	27	27	27	27
Hansen Test	.735		AR(1)	.049
Wald Test	.012		AR(2)	.329

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.16 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Economic Growth (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and private investment (I), public expenditure (PE), and human development (HD) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

It is evident from the results that financial intermediation's direct effect on growth of efficiency-driven economies is significant and positive. This positive correlation is supported by Yakubu et al. (2021), Yakubu and Abdallah (2021), Konstantakopoulou (2023), Ramesh and Guruprasad (2024), and numerous other authors in the existing literature, which offer valuable insights into the manner in which this relationship is represented in various types of economies. The primary objective of efficiency-driven economies is to enhance their competitiveness and production efficiency by promoting infrastructure development and industrialization. Financial intermediaries in these

countries are essential for the efficient allocation of capital to the most productive sectors, the support of business activities, and the reduction of external finance costs. This, in turn, fosters investment, enhances economic efficiency, competitiveness, and overall economic growth. These economies gain from financial intermediation and, in particular, provide support to small startups, for enhancement of efficiency and economic diversification (Beck & Levine, 2004; Levine, 2005). Efficiency-driven countries exhibit a variety of growth and stability patterns in their financial development. In accordance with the most recent global economic outlook for 2022-2023 from the World Bank, these nations exhibit varying degrees of financial sector development as they transition from fundamental infrastructure and industrialization to more intricate production processes. Algeria, for example, maintains an ongoing initiative to enhance financial inclusion and banking sector stability, as evidenced by its Financial Development Index (FDI) of 0.35. Likewise, Argentina's financial sector development is significantly impacted by high inflation and economic instability, despite its FDI of 0.46. A well-developed banking sector and a burgeoning fintech industry are the driving forces behind Mexico's relatively higher financial development, as evidenced by an FDI of 0.57. Financial inclusion and growth of Philippines's economy have significantly improved, despite regulatory and market challenges, with an FDI of 0.50. With an FDI of 0.60, South Africa is distinguished by its sophisticated financial sector; however, corruption and economic inequality persist. Peru stands at 0.606, while Thailand has an FDI of 0.55, indicating a strong banking system and proactive adoption of financial technologies. However, rural financial inclusion requires additional attention. This is why financial development is essential in efficiency-driven economies to support economic activities and improve overall productivity. Better resource allocation, reduced transaction costs, and improved risk management are all facilitated by improved financial intermediation, all of which collectively contribute to economic growth.

Investment appears to have a beneficial effect on economic growth and is statistically significant at the 1% level of significance, in line with the findings of Kong et al. (2020) and Trpeski and Cvetanoska (2019). This is because increase in investment contributes to the expansion of productive capability, which in turn enhances productivity and positively impacts economic growth. Investment results in a rise in employment opportunities, improved infrastructure, and a trajectory toward industrialization, all of which contribute to the economy's substantial growth. Investments that enhance productivity and improve

the quality of infrastructure and human capital are highly advantageous to economies that drive efficiency. In countries that are particularly transitioning toward higher efficiency, investment typically concentrates on the improvement of industrial capabilities, infrastructure, technology, logistics, and transportation networks, which ultimately leads to an increase in overall productivity (Du et al., 2022).

A 1% significance level is indicated in Table 4.20 for a positive relationship between public spending and economic growth. Numerous empirical studies that demonstrate the positive impact of public spending on economic growth lend support to this result (e.g. Keynes, 1936; Romer, 1986; Barro, 1990; Devarajan et al., 1996; Perotti, 2007; Becker, 2009). Public spending helps to drive economic growth by investing in infrastructure, developing human resources, conducting research and development, building social safety nets, ensuring macroeconomic stability, and fostering strong institutional frameworks. In efficiency-driven economies, governments direct public investments in infrastructure, healthcare, and education, thereby increasing productivity and improving human capital quality. Investments in roads, ports, communication networks, as well as education and healthcare, result in significant increases in economic efficiency. Government expenditure helps to create an environment conducive to economic activity and attracts private investment by lowering the costs and risks connected with economic activities (Gurdal et al., 2021).

Human development's impact on economic growth differs across the methodologies due to how these models account for unobserved heterogeneity and endogeneity. Since the Pooled OLS model does not compensate for country-specific effects, the negative and substantial HD coefficient supports omitted variable bias. While accounting for some of these unobserved effects, in RE model HD is better captured but still affected by random changes. The FE model, which adjusts for all time-invariant changes between nations, yields a very significant positive coefficient at the 1% level with a huge coefficient value, reflecting the enormous variance in HDI within countries over time. Finally, the GMM model, which uses instrumental variables to address endogeneity, yields a significant and normal coefficient, confirming the robustness of the relationship. The findings of Fatah et al. (2012) and Grubaugh (2015) are consistent with this finding. It is evident that the productivity and expansion of the economy are influenced by the improvement of education, health, and per capita income. A workforce that is more educated, competent,

and in good health is more productive and innovative, and is more likely to engage in research and development. Ultimately, this leads to technological advancement and the development of economic prosperity and sustainability. Therefore, human development depicts two-way causality, meaning that increased levels of human development result in faster economic growth. This underscores the feedback cycle, in which economic growth also supports further advancements in human development (Ranis et al., 2000). Efficiency-driven economies capitalize on human development advancements by optimizing resource utilization and productivity (Elistia & Syahzuni, 2018; Gulcemal, 2020). Consequently, human development fosters technical innovation, boosts productivity, and promotes economic diversification, it is essential to contribute to the process of sustained economic progress.

4.4.3. Effect of Financial Intermediation on Entrepreneurship

This section utilizes the second model to explore the financial intermediation's direct impact on entrepreneurship in countries driven by efficiency. SEM requires this direct impact to be statistically significant. Appropriate panel data methodologies i.e. POLS, RE, FE, and GMM have been employed to address any possible econometric issues like endogeneity or heterogeneity and to ensure correctness and reliability of results. As indicated in section 4.2.2, GMM results are more reliable and resilient in minimizing any biases that may affect other approaches, making it a preferred choice for interpretation. Table 4.17 shows the results of all techniques, but this study relies on GMM, thus the results are interpreted accordingly. The GMM model instruments are found to be valid and acceptable by the Hansen test, which yielded a p-value of 0.271. In this analysis, instruments are constructed using the second to fourth lags of the independent and control variables. Although the Cragg-Donald test does not apply to GMM, instrument strength is evaluated through first-stage results and Wald F-statistics, which consistently exceed the standard threshold of 10. This indicates that the instruments are strong and unlikely to suffer from weak identification issues. Reliable instruments are those that are strongly correlated with the endogenous variables and uncorrelated with the error term. The favorable results of the Hansen and Wald tests further validate the suitability and strength of the instruments employed in the model. The residuals exhibit first-order autocorrelation (p-value = 0.011 for AR(1)), but no second-order autocorrelation is shown

by the p-value for AR(2). Furthermore, the p-value of 0.001 for the Wald test indicates that the explanatory factors adequately account for the dependent variable in the model.

Table 4.17: Effect of Financial Intermediation on Entrepreneurship

	Pooled OLS	Random Effect	Fixed Effect	GMM
Variables	lnEnt	lnEnt	lnEnt	lnEnt
lnFI	.451***	.077***	.064***	.448***
	(.032)	(.012)	(.012)	(.034)
lnUN	.372***	-.015	-.041**	.366***
	(.037)	(.016)	(.015)	(.040)
GE	.660***	.048	.045**	.935***
	(.141)	(.034)	(.022)	(.163)
RL	-1.643***	-.129***	-.09***	-1.895***
	(.127)	(.036)	(.031)	(.144)
Cons	-2.087***	11.874***	12.602***	.1.988***
	(.497)	(.379)	(.413)	(.521)
Observations	584	584	584	555
Countries	27	27	27	27
Hansen Test	.271		AR(1)	.011
Wald Test	.001		AR(2)	.636

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.17 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Entrepreneurship (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and unemployment (UN), government effectiveness (GE), and rule of law (RL) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

At the 1% significance level, the findings unambiguously demonstrate that financial intermediation has a favorable and substantial impact on entrepreneurship. The computed coefficient demonstrates that a one percentage point increase in financial intermediation improves entrepreneurship by 0.448 percentage points, demonstrating that financial intermediation is a critical component in promoting entrepreneurship in efficiency-driven economies. The finding that financial intermediation's impact on entrepreneurship is positive corroborates with the findings of Ajide (2020) and Dutta and Meierrieks (2021) and in accordance with the Schumpeterian entrepreneurial theory. This theory focuses on how financial resources ensure innovation and progression in the economy (Schumpeter, 1911). The growth of financial services, especially digital and microfinance services, have increased financial intermediation (to be more efficient) in some countries. Due to mobile banking, especially in developing countries, more people can use financial services owing to advanced financial inclusion. The way financial services are used has transformed with the advent of digital platforms, among most other things, which helps

entrepreneurs manage their business finance and access funding (Demirguc-Kunt et al., 2020). Financial intermediation has the most powerful impacts on fostering entrepreneurship in efficiency driven economies to the extent that they provide critical financial infrastructure such as loans and credit lines. These ease and greatly encourage entrepreneurs to expand operations. Reduced costs to capture information, as well as transaction costs provided by financial intermediaries, eases the process of launching and growing business for firms. Thus, the development of financial services directly contributes to the sharpening of the allocation of resources and fosters entrepreneurship (Ayyagari et al., 2011; Levine, 2005). This conclusion is manifested in and correlates with the status and statistics of new patents and business registrations in efficiency-driven economies, indicating strong activity. According to the World Intellectual Property Indicators Report 2023, in Argentina, there were 4,850 new patent applications filed in 2022, indicating a consistent trend of innovation. Mexico likewise exhibits substantial activity, with 6,120 new patent filings in the same year. Latvia, a small but active economy, received 1,250 new patent applications. In terms of new business registrations, Peru had roughly 50,000 new firms in 2022, while Mexico had around 300,000 new enterprises. Similarly, South Africa saw over 110,000 new business registrations, showing a thriving entrepreneurial sector. These statistics highlight that financial intermediation fosters innovation and stimulates entrepreneurial activity.

The influence of unemployment on entrepreneurship in efficiency-driven economies yields conflicting results across econometric models. Pooled OLS and GMM models show a strong positive link; however, the Random Effects (RE) model shows a negative and small impact, suggesting that additional country-specific factors may influence this relationship (Wooldridge, 2010). The Fixed Effects (FE) model finds a significant negative impact, implying that within-country differences in unemployment negatively affect entrepreneurship, possibly due to the bad economic conditions suggested by high unemployment (Parker, 2006). However, given the GMM model's robustness in addressing endogeneity, it provides the most reliabe insight, emphasizing the prevalence of necessity-driven entrepreneurship in these economies due to unemployment, since individuals start enterprises out of necessity (Acs, 2006). This finding is consistent with (de Fonseca, 2022), who discovered that unemployment doubles the likelihood of an individual starting a business. Unemployed people in efficiency-driven economies are more inclined to create their own firms as a realistic alternative to traditional wage work.

This transition results in increased economic dynamism and diversification, which boosts productivity and efficiency within existing markets. These entrepreneurs frequently leverage their sector experience and knowledge to build enterprises that improve value chains and maximize resource utilization (Fritsch & Mueller, 2004; Acs & Varga, 2008). Because unemployment is a major economic issue in almost every country, governments in these countries view entrepreneurship as a viable option and implement policies to encourage individuals to start their own businesses as an alternative to wage employment because the opportunity cost for jobless people to launch a new business is lower. Furthermore, because of its counter-cyclical nature in response to unemployment, entrepreneurship provides a dual benefit: on the one hand, it helps to reduce unemployment, and on the other, if successful, it creates more job opportunities, leading to economic diversification, productivity improvements, and innovation (Faria, 2015).

The significant and positive influence of government effectiveness on entrepreneurship in efficiency-driven countries corresponds with the works of Rodriguez-Gulias et al. (2018) and Ajide (2022). The value of coefficient 0.935 suggests that government effectiveness is crucial for stimulating entrepreneurship in these economies. People of efficiency-driven countries perceive the government as effective, they trust public institutions and believe that the government will maintain economic stability and provide necessary support to their businesses. This trust reduces the perceived risks associated with entrepreneurship and encourages investment in new ventures (Levie & Autio, 2008; Welter, 2012). Therefore, effective governments create a supportive environment for businesses through reliable infrastructure, efficient public services and sound economic policies. They reduce bureaucratic red tape and ensure that policies aimed at supporting entrepreneurship, such as tax incentives, grants, and access to credit, are implemented efficiently and reach their intended beneficiaries (Kaufmann et al., 2011). This stability encourages entrepreneurs to invest in new ventures with confidence and make it easier to start and run businesses.

The negative and significant impact of rule of law on entrepreneurship in efficiency-driven countries is against the typical positive connotation. However, this counterintuitive result corresponds with the outcomes of numerous researches in the body of current literature, for instance (Friedman, 2011; Aisen & Veiga, 2013; Obaji & Olugu, 2014; La Porta & Shleifer, 2014; Guerrero et al., 2021; Audretsch et al., 2022) who have demonstrated that entrepreneurial activities can be suppressed in environments where

regulatory frameworks are either inefficiently implemented or excessively stringent. In some economies driven by efficiency, the enforcement of certain laws and regulations can suppress innovation and risk-taking. Excessive order may evoke fear within potential entrepreneurs. In certain places, the rule of law is linked to high corruption and unofficial dealings. It is plausible for entrepreneurs to assume that these systems operate on nepotism, which discourages true entrepreneurial ambitions. Stringent compliance with legal structures incurs hefty costs and overwhelms businesses, thus stifling innovation. Even when the law is applied fairly and with good intentions, excessive regulation creates barriers for active entrepreneurs, leading to a stagnation in business growth (North, 1990; Treisman, 2000; Djankov et al., 2002). A well-structured rule of law can instill fear of harsh consequences for failures or minor legal infractions, which stifles innovation and risk-taking. There is a possibility that entrepreneurs will guard themselves against harsh legal repercussions, and this will discourage creative and bold actions (Tonoyan et al., 2010). While other economies focus on growth, these are considered inefficient and tend to lack rationale. Perceptions such as this one could undermine confidence in the legal system, thereby discouraging entrepreneurial engagement in pursuits which necessitate legal dispute resolution or safeguarding (Aidis et al., 2008).

These highlighted differential outcomes illustrate the relationship between governance, legal institutions, and economic activity. Strong governments provide greater relief and predictability to entrepreneurs, while inflexible and corrupt systems of law may provoke entrepreneurial aversion. These relationships are important for policymakers who wish to promote entrepreneurship.

4.4.4. Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth

This section looks into how entrepreneurship mediates the association of financial intermediation with growth of the efficiency-driven economies. Moderated mediation approach, as described by Muller et al. (2005) is used to achieve the objectives. Structural equation modeling (SEM) is utilized to estimate all regression models simultaneously, allowing for an in-depth understanding of the interrelationships among these variables (Awang, 2014).

4.4.4.1. Structural Equation Modeling (SEM)

Table 4.18 displays the structural equation modeling results.

Table 4.18: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.076	.007	10.00	.000
lnFI	.055	.009	5.77	.000
lnPE	.396	.017	22.72	.000
lnI	.484	.019	25.13	.000
HD	.109	.129	.85	.398
Cons	2.025	.106	19.02	.000
lnENT ←				
lnFI	.449	.031	14.29	.000
lnUN	.365	.036	10.04	.000
GE	.786	.138	5.68	.000
RL	-1.746	.124	-14.08	.000
Cons	-1.986	.486	-4.08	.000

LR test of model vs. saturated: $chi^2(6) = 201.59$, Prob > $chi^2 = 0.0000$

Table 4.18 presents the estimation results from Structural Equation Modeling (SEM) when Entrepreneurship (Ent) is included as a mediator. The regression models are estimated simultaneously and the associations among variables are examined at the same time. The p-values indicate the significance levels of the estimated relationships.

The findings of structural equation modeling (SEM) demonstrate a significant and positive financial intermediation's impact on entrepreneurship as well as on growth of efficiency-driven economies. The coefficient's value of 0.449 and 0.055 represents this direct impact. The findings of Dutta and Meierrieks (2021) and Konstantakopoulou (2023) are in line with these results. The importance of financial intermediation and its direct influence on entrepreneurship and economic growth have been elucidated in the prior discussion in the aforementioned sections. The findings also show that entrepreneurship contributes to economic growth in a statistically meaningful and favorable way. The direct impact of entrepreneurship (depicted by its coefficient 0.076) on economic growth illustrates that it encourages innovation, create jobs, and increase competition, which ultimately leads to increase in productivity and efficiency of the economy. These findings of Kim et al. (2022) are also consistent with this outcome. Likewise, Acs et al. (2013) also states the positive role of entrepreneurship in fostering economic growth because it leads to job creation and technical innovation. Entrepreneurs stimulate economic activity and boost growth rates by creating new markets and increasing competition. The results of SEM are broadly consistent with previous findings of GMM. The only noticeable variation in SEM results is the acknowledgement of human

development's insignificant influence in economic growth when mediator is included in the model. While analyzing the financial intermediation's direct impact on growth of efficiency-driven economies, human development has a significant positive effect. However, when entrepreneurship is included as a mediator in the model, the significance of human development changes (p-value = 0.398). One possible explanation for this observed change is the mediation effect of entrepreneurship, which frequently serves as a channel through which human development promotes economic progress. When entrepreneurship is incorporated into the model, it captures the human development's indirect effect on economic growth, making its direct impact insignificant. This is consistent with Knowledge Spillover Theory, which states that entrepreneurship complements human capital, therefore the direct impact of human development is reduced when entrepreneurship is taken into account (Acs et al., 2009). Furthermore, contextual differences among the panel's twenty seven countries could be a factor, as the relationship between these two variables in efficiency-driven countries may be less direct. Thus, this relationship is intricate and varied in these countries and inclusion of entrepreneurship as a mediator variable alters the interactions of how human development drives growth of efficiency-driven economies.

4.4.4.2. Testing Mediation

The mediation analysis is conducted by employing a methodology originally proposed by Baron and Kenny (1986) and Kenny (2024). This methodology involves three fundamental procedures, as described in Chapter 3, which are necessary for showing mediation. Table 4.19 presents the results of the mediation analysis.

Table 4.19: Baron and Kenny approach & Sobel's Test

Estimates	**Delta**	**Sobel**
Indirect effect	.034	.034
Std. Err.	.004	.004
z-value	8.192	8.192
p-value	.000	.000
Conf. Interval	.026 , .042	.026 , .042

STEP 1: lnENT:lnFI (X → M) ; β=0.449 ; p=0.000
STEP 2: lnEG:lnENT(M → Y) ; β =0.076 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.055 ; p=0.000
All the three steps Sobel's test are significant, therefore the ***Mediation is Partial***

Table 4.19 presents the indirect effect of financial intermediation (FI) on economic growth (EG) through the mediating role of entrepreneurship (Ent) by reporting the three steps of Baron and Kenny approach. The significance of this mediation is evaluated using Sobel's test, with p-values indicating statistical relevance.

It can be seen that the direct effect of financial intermediation is 0.055 and it favorably influences economic growth (p-value 0.000). This suggests that there is an effect that has to be mediated. Furthermore, it is evident that financial intermediation's positive direct impact on entrepreneurship is 0.449 (p-value 0.000). Moreover, the impact of entrepreneurship is 0.076 and it influences economic growth positively (p-value 0.000). Consequently, financial intermediation affects both the variables and contributes to entrepreneurship as well as growth of the economy. It has been determined that financial intermediation's impact is reduced subsequent to the inclusion of entrepreneurship as a mediator in the model, as a portion of the effect has been shifted through the entrepreneurship. Accordingly, financial intermediation's indirect effect on growth of efficiency-driven economies through the channel of entrepreneurship is 0.034 i.e. (0.449 x 0.076), which has been reduced, thereby demonstrating partial mediation. This indicates that financial intermediation initially influences entrepreneurship, which in turn influences growth of these economies. The findings demonstrate that all three stages of the Barron and Kenny approach are significant and financial intermediation's effect on economic growth has been reduced, therefore it is concluded that entrepreneurship partially mediates this relationship in efficiency-driven countries.

4.4.4.3. Validating Mediation through Sobel's Test

Sobel's (1987) z-test is used to assess the statistical significance of the mediation effect in order to authenticate the mediation's results. It is inferred from the Table 4.19 that the z-value calculated from Sobel's test is 8.192 which is greater than ± 1.96 and is also significant with p-value 0.000 so it is confirmed that the mediation is significant.

4.4.4.4. Validating Mediation through Zhao's Test

For further confirmation of the statistical significance of the mediation effect, an approach proposed by Zhao et al. (2010) is applied. Table 4.20 presents the outcomes of this methodology.

Table 4.20: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.034	.034
Std. Err.	.004	.004
z-value	8.192	8.240
p-value	.000	.000
Conf. Interval	.026 , .042	.026 , .042

STEP 1- lnEG:lnFI (X → Y) with β =0.055 and p=0.000
As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation **(Partial Mediation)**

Table 4.20 presents the mediating role of entrepreneurship(Ent) between financial intermediation(FI) and economic growth(EG) by reporting the steps of Zhao, Lynch & Chen's approach. The significance of this mediation is evaluated using Monte Carlo test, with p-values indicating statistical relevance.

It is apparent that the indirect effect is 0.034 which is positive and is in the same direction as of direct effect which is 0.055. Moreover, the significance of Monte Carlo and non-zero confidence interval confirms that financial intermediation's indirect impact on growth of efficiency-driven economies through the channel of entrepreneurship is statistically significant.

4.4.4.5. Effect Size of the Mediation

The ratio of indirect effect to total effect (RIT) determines the effect size of mediation. RIT determines the proportion of the effect of the financial intermediation on economic growth that is mediated by entrepreneurship, whereas, the ratio of indirect effect to direct effect (RID) determines its magnitude. Table 4.21 displays the results of RIT and RID.

Table 4.21: Effect Size of the Mediation

	Ratio of indirect effect to total effect	
RIT	=	(Indirect effect / Total effect) (0.034 / 0.089) = 0.384
	Ratio of indirect effect to direct effect	
RID	=	(Indirect effect / Direct effect) (0.034 / 0.055) = 0.622

Table 4.21 reports the effect of mediation and its magnitude by calculating the ratio of indirect effect to total effect (RIT) and ratio of indirect effect to direct effect (RID)

The RIT value indicates that entrepreneurship mediates 38% of financial intermediation's impact on the growth of efficiency-driven economies, while RID indicates that the mediated effect is approximately 0.6 times larger than the direct effect. As revealed in mediation analysis, entrepreneurship strongly mediates the financial intermediation-growth relationship in efficiency-driven economies. The results, with an RIT of 0.381 and

RID of 0.633, indicate that indeed entrepreneurship significantly mediates the relationship therefore entrepreneurial activities are critical in transforming financial resources into economic growth in an economy (Schumpeter, 1934; King & Levine, 1993). The mediated impact of entrepreneurship underscores that although direct impacts of financial intermediation like capital provision and financial stability are important for fostering economic growth, the indirect impacts through entrepreneurship transcend these advantages making entrepreneurial processes pivotal to productivity and growth (Burchi et al., 2021). This finding demonstrates the objective of the research highlighting the fact that financial intermediation creates economic value, which can be enhanced by the existence and growth of an entrepreneurial ecosystem. Financial intermediation plays a critical role in efficiency driven economies because it offers the needed capital to the firms. These nations optimize their production processes and productivity by financial intermediation. Businesses are able to modernize and streamline operations because financial institutions provide facilitated access to capital (Levine, 2005; Feyen et al., 2023). The way in which financing is provided only partially underscores the significance of entrepreneurship in additive and productive economic growth. It is through these financial means that entrepreneurs enhance their market competitiveness, innovation, and economic processes, stimulating growth. As noted in the GEM Global Report 2023/2024, the Total Early-Stage Entrepreneurial Activity (TEA) rate in efficiency driven countries indicates varied levels of entrepreneurial engagement. For example, Argentina's TEA rate stands at approximately 16.3%, suggesting high activity levels. Bosnia and Herzegovina's TEA rate of about 8.2% reflects moderate entrepreneurial activity, while Mexico surpasses Argentina with a TEA rate of 17.5%, indicating robust entrepreneurial engagement. In contrast, Thailand holds the highest TEA rate at 21.5%, while South Africa stands at 10.8%. The remarkable figures highlight the significance of entrepreneurship in early-stage endeavors. In efficiency-driven economies, entrepreneurs act as value-adding catalysts by utilizing financial resources to create value, grow companies, and venture into new markets (Djankov et al., 2002). This study brings to the forefront the importance of sustainability in economic development, emphasizing the need for an entrepreneurial ecosystem supported by strong financial intermediation in efficiency-driven countries.

4.5. Analysis of Resource-Driven Countries

This section's objective is to investigate whether entrepreneurship serves as a mediator between financial intermediation and growth of resource-driven economies. The panel is comprised of twenty-nine nations based on GEM categorization. Resource-driven economies are defined by their substantial dependence on the extraction and exportation of natural resources. This reliance on oil, gas, minerals, and agricultural goods etc. has a considerable influence on their economic development and stability. These economies frequently undergo boom-and-bust cycles as a consequence of fluctuations in global commodity prices, which induce economic volatility. They often have difficulties in achieving diversification, as their emphasis on a limited number of primary exports might hinder the growth of other industries such as manufacturing and services. Resource-dependent economies may encounter difficulties such as disparities in income, corruption, and the resource curse, which occurs when the availability of natural resources impedes overall economic progress by deterring investment in other sectors (Smallbone et al., 2022). The same three models employed in the preceding section and described in chapter three are used to analyze this association in resource-driven economies.

4.5.1. Descriptive Statistics

The descriptive statistics provided for the resource-driven countries offer a comprehensive view of the key variables under analysis. The upper panel of table 4.22 shows descriptive statistics from the original dataset for a panel of 29 resource-driven nations during a 25 years period. Each variable has a different number of observations due to missing values. Economic Growth (EG) is real GDP measured in billions of USD, has a mean of 61.0 billion, ranging from 344 million to 503 billion, with a high standard deviation (90.9 billion), substantial positive skewness (2.587), and leptokurtic distribution (kurtosis = 10.237), indicating that a few countries with extremely large economies have a significant influence on the distribution. Entrepreneurship (ENT) has an average of 55.41 with a rather high standard deviation (SD = 24.72), but the distribution is moderately symmetric (skewness = -0.253) and mildly platykurtic (kurtosis = 1.73), indicating modest variation among nations. Financial intermediation (FI) has a mean of 37.87, a large range of 5.94 to 137.91, and moderate right-skewness (0.93), indicating a

concentration of significant financial development in a few economies. Investment (I) is more equally distributed (mean = 22.15, SD = 6.03), with positive skewness (0.78) and kurtosis (3.98), indicating that a few high-investment countries pull the distribution's tail. Public expenditure (PE) has a mean of 13.42, is somewhat right-skewed (0.31), and has a moderate kurtosis (3.20), indicating a generally balanced distribution. Unemployment (UN) varies significantly (mean = 7.39, SD = 5.35), with moderate positive skewness (0.91) and a kurtosis of 2.96, indicating a minor concentration of high unemployment in selected nations. Human development (HD) has a mean of 0.602 with a limited range, low dispersion (SD = 0.115), and a somewhat left-skewed distribution (skewness = -0.172), indicating a clustering of countries with moderate HDI values. Both institutional variables, government effectiveness (GE) and rule of law (RL), have negative means (-0.316 and -0.328, respectively), indicating lower institutional quality on average. However, both have moderate right-skewness (1.097 and 0.636) and high kurtosis, particularly for GE (4.39), showing that while most countries perform poorly, a few have significantly superior governance.

Table 4.22: Descriptive Statistics

Descriptive Statistics before Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
EG (Billion USD)	721	61	503	0.334	90.9	2.586	10.236
ENT	725	55.411	95.13	12.16	24.718	-0.252	1.727
FI	550	37.867	137.912	5.938	28.014	0.929	3.046
I	656	22.152	47.076	8.948	6.030	0.783	3.989
PE	608	13.420	30.069	0.951	4.868	0.307	3.204
UN	725	7.392	23.8	0.4	5.356	0.909	2.963
HD	648	0.602	0.825	0.293	0.115	-0.171	2.341
GE	721	-0.315	1.572	-1.299	0.563	1.096	4.390
RL	725	-0.327	1.555	-1.441	0.612	0.635	3.032
Descriptive Statistics after Data Transformation							
Variables	**Obs**	**Mean**	**Max**	**Min**	**SD**	**Sk**	**K**
lnEG	721	23.834	26.943	19.655	1.620	-0.558	3.174
lnENT	725	14.310	17.631	9.591	2.417	-0.487	2.082
lnFI	550	22.575	26.571	18.677	1.726	-0.715	2.222
lnI	656	22.291	25.542	18.049	1.627	-0.524	2.967
lnPE	608	21.750	24.357	17.926	1.423	-0.786	3.505
lnUN	725	12.208	15.483	5.898	1.828	-1.249	4.544
HD	648	0.602	0.825	0.293	0.115	-0.171	2.341
GE	721	-0.315	1.572	-1.299	0.563	1.096	4.390
RL	725	-0.327	1.555	-1.442	0.612	0.635	3.032

This table presents the descriptive statistics for the variables used in the panel analysis of resource driven countries. The table includes the number of observations (Obs), mean, standard deviation (Std. Dev), minimum (Min), maximum (Max), skewness (Sk), and kurtosis (K) for each variable.

The descriptive statistics of the upper panel indicate heterogeneity in the original dataset; thus, all variables except index-based measures have been standardized to ensure scale consistency, as described in section 3.8 of the variable description. Furthermore, these

variables have been log transformed to account for skewness and meet the normality requirement. The lower panel of table 4.22 displays the descriptive statistics after transformation and post-standardization. Economic growth (lnEG) has a mean value of 23.834 with a standard deviation of 1.620, indicating relatively moderate variation across the 458 observations, while its skewness (-0.558) and kurtosis (3.174) suggest a slightly left-skewed distribution with a sharper peak than the normal distribution. Entrepreneurial activity (lnENT) has a mean of 14.310 and a standard deviation of 2.417, highlighting noticeable variability, with a mild left skew (-0.487) and a platykurtic distribution (2.082). Financial intermediation (lnFI) has a mean value of 22.575 and ranges from 18.677 to 26.571, with a left skew of -0.715 and a kurtosis of 2.222, implying a somewhat flatter distribution. Investment (lnI) and public expenditure (lnPE) are quite similar in distribution, both with means slightly above 22, but with lnPE exhibiting slightly higher kurtosis (3.505) and skewness (-0.786), indicating a longer left tail and more peaked distribution. Human development (HD) shows a mean of 0.602 and a low standard deviation (0.115), indicating that most countries have relatively close HDI values, and the distribution is nearly symmetric (skewness -0.171) and moderately peaked (kurtosis 2.341). Governance effectiveness (GE) and rule of law (RL) are both negative on average (-0.315 and -0.327 respectively), reflecting challenges in institutional quality among resource-driven economies, but their distributions vary significantly. GE is right-skewed (1.096) and leptokurtic (4.390), suggesting that while most countries cluster at lower scores, a few perform significantly better, while RL shows more balanced skewness (0.635) and a slightly peaked distribution (3.032). These summary statistics suggest that, across these countries, development and governance indicators demonstrate notable variability, offering a rich landscape for comparative policy and econometric analysis.

4.5.2. Effect of Financial Intermediation on Economic Growth

This section uses the first model to analyze the financial intermediation's direct effect on growth of resource-driven economies. This direct impact must be statistically significant in order for SEM to be applicable. Appropriate panel data techniques have been utilized to ensure the reliability and accuracy of the results, thereby mitigating potential econometric issues, including heterogeneity and endogeneity. This study utilizes POLS, RE, FE, and GMM; however, as previously discussed in Section 4.2.2, GMM results are

more reliable and resilient in mitigating potential biases that may influence other methodologies, rendering it an optimal choice for interpreting results. Table 4.23 includes the results of all approaches; however, this investigation is reliant upon GMM; therefore, the results of GMM are interpreted in accordance with the aforementioned rationale. The instruments of the GMM model have been considered to be valid and appropriate, as indicated by the Hansen test (p-value 0.279). The instruments are developed using the second to fourth lags of both the independent and control variables. Since the Cragg-Donald test is not applicable in the context of GMM, the strength of the instruments is assessed using first-stage regression outputs and Wald F-statistics, which consistently surpass the commonly accepted threshold of 10. This suggests that the instruments are robust and not affected by weak identification. Strong instruments exhibit a high correlation with the endogenous variables while remaining uncorrelated with the error term, which ensures accurate and consistent estimates. The positive results from the Hansen and Wald tests provide additional confirmation of the validity and effectiveness of the instruments used in this model. The p-value of AR(1) is 0.015, which suggests that the residuals exhibit first-order autocorrelation. However, there is no evidence of second-order autocorrelation, which is a positive development, as the p-value of AR(2) is 0.491. Also, it confirms the suitability of the lagged instruments in the model. The explanatory factors appear to be jointly significant and adequately explain the dependent variable in the model, as indicated by the Wald test's p-value of 0.006.

Table 4.23: Effect of Financial Intermediation on Economic Growth

	Pooled OLS	Random Effect	Fixed Effect	GMM
Variables	lnEG	lnEG	lnEG	lnEG
lnFI	.072***	.192***	.133***	.097***
	(.016)	(.027)	(.021)	(.022)
lnI	.598***	.332***	.181***	.235***
	(.024)	(.037)	(.025)	(.037)
lnPE	.369***	.325***	.177***	.451***
	(.023)	(.067)	(.032)	(.061)
HD	-.809***	-.362	2.585***	.704
	(.108)	(.227)	(.341)	(.455)
Cons	1.325***	5.194***	.11.359***	6.14***
	(.164)	(.547)	(.697)	(.1.117)
Observations	460	460	460	431
Countries	29	29	29	29
Hansen Test	.279		AR(1)	.015
Wald Test	.006		AR(2)	.491

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.23 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Economic Growth (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and private investment (I), public expenditure (PE), and human development (HD) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

The results reveal a significant and positive financial intermediation's effect on growth of resource-driven Economies. This finding corroborates with Yakubu et al.(2021), Konstantakopoulou (2023) and more recently Ramesh and Guruprasad (2024). In case of resource-driven economies, financial intermediation aids in the diversification of these nations' economies by directing resources into non-resource sectors, lowering reliance on natural resources and allowing them to overcome issues like the resource curse and economic instability. Financial intermediation offers credit and risk management instruments to offset the consequences of resource price volatility, resulting in stable investments and balanced economic growth (Beck, 2012; Badeeb et al., 2017). However, in these economies, financial intermediation mostly benefits major companies and small and medium-sized firms (SMEs), who require loans for expansion and operational efficiency, as opposed to new entrants and entrepreneurs. This is because the financial sector is evolving, and there are continuous efforts to boost financial development in resource-driven countries, but issues such as restricted access to financial services, poor market depth, and inefficiencies in the financial sector remain. According to the global economic outlook for 2022-2023 from the World Bank, Angola has relatively low financial development, with an FDI score of 0.21, suggesting restricted availability of financial services along with low levels of financial market depth and efficiency. This can

be attributed primarily to the dependence on oil exports and the lack of development in other economic areas. In contrast, Bangladesh has made notable strides in achieving a financial development index (FDI) score of 0.35, especially in regard to financial inclusion, outperforming many other emerging economies. However, it continues to struggle with the depth and efficiency of the financial market. With an FDI score of 0.45, Botswana shows moderately greater economic advancement relative to other resource-driven countries and possesses a slightly more developed financial sector. There have been efforts toward financial inclusion; however, capital accessibility for small and medium enterprises (SMEs) is still a significant challenge. Ethiopia's financial sector has an FDI score of 0.22, one of the lowest in the world, due to scarce access to financial services and shallow financial market depth. Although some measures are being taken, progress towards financial inclusion has been slow. Ghana has a growing financial sector with an FDI score of 0.39, demonstrating improved financial inclusion and market depth. These observations underscore the importance efficient financial institutions serve in advancing economic development amid diverse economic environments. For the sample of resource-driven economies, the results affirm the strong and positive relationship financial intermediation has on economic development. The computed coefficient demonstrates the economic growth is augmented by 0.097 percentage points for each percentage increase in financial intermediation. This underscores the importance of establishing sound financial structures for the sustained advancement of resource-based economies.

Based on the analysis, investment has a considerable and positive impact on the growth of resource-driven economies, which is supported by the findings of Trpeski and Cvetanoska (2019) and Kong et al. (2020). This is because investment increases the productive capacity as well as the output and economic development. In resource driven economies, investment shifts the economic structure by investing in other sectors, lessening the dependence on the natural goods. Investment also shields economies from the resource curse. Moreover, infrastructure, educational investments, and spending in non-resource sectors aids in stabling and sustaining economic growth. As stated by Boamah et al. (2018), targeted investments in human capital and infrastructure foster more stable and sustainable economic growth. This illustrates the importance of capital deepening in enhancing growth in resource driven economies.

The finding that public spending sways positively economic growth is consistent with numerous empirical studies, such as those by Keynes (1936), Romer (1986), Barro (1990), Devarajan et al. (1996), Perotti (2007), and Becker (2009), all of which have documented the positive impact of public spending on economic growth, demonstrating strong positive correlations with the growth of resource-driven economies. Investments in infrastructure, human resource development, research and development activities, the creation of social safety nets, macroeconomic stabilization, and the establishment of sound institutions all contribute towards public spending supporting economic growth. In resource driven economies where there is a heavy reliance on natural resources, public spending helps to diversify the economic foundation and reduces the reliance on natural resources. Public expenditure on infrastructure and human capital is essential to diversify the economy and sustain growth in countries increasingly prone to the "resource curse," where abundant natural resources impede growth. Public expenditure in infrastructure, education, and other non-resource sectors facilitates the stabilization and sustained growth of the economy. These countries are able to avoid the resource curse by promoting economic diversification and stability through targeted public investments (Sebri et al., 2023). Therefore, Sustainable economic growth is contingent upon public expenditure, which enhances productivity, promotes diversification, and propels technological advancements.

There are variations in how human development affects economic growth depending on the methodology used. This is because each model handles unknown heterogeneity and endogeneity in its own way. Since the Pooled OLS model does not compensate for country-specific effects, the negative and substantial HD coefficient supports omitted variable bias. While accounting for some of these unobserved effects, the RE model yields a negative and negligible coefficient, demonstrating that random changes still affect HD. The FE model, which adjusts for all time-invariant changes across countries, yields a very significant positive coefficient at the 1% level with a huge coefficient value, indicating the vast variance in HDI within countries over time. Finally, the GMM model, which uses instrumental variables to address endogeneity, yields a positive but insignificant coefficient with a normal magnitude, indicating that HDI has no effect on economic growth in resource-driven economies. Resource-driven economies frequently face the "resource curse," which is characterized by a lack of investment in human capital sectors, including education and health, which are crucial for long-term growth (Sachs &

Warner, 1995; Ross, 1999). Inefficient resource utilization is further exacerbated by the weak institutional character of these economies, as the effective utilization of human capital is heavily reliant on strong institutions (Pritchett, 2001). Moreover, studying the short to medium-term impact of human development improvements suggests that advantages are not immediately apparent (Barro, 1997). Social problems such as corruption along with socio-economic income inequality stifle the possible growth rewards of human development (Mehlum et al., 2006). Moreover, these distortions along with chronic underemployment create a gap in the skills taught in educational and vocational training institutions relative to what the market requires. This weakens the relationship even more (Hanushek & Woessmann, 2008). The findings highlight the need for targeted educational and health initiatives that go beyond primary metrics of investment and focus on quality, relevance to market expectations, and geared towards the needs of the workforce. To counterbalance this imprecision, educational reforms aimed at improving the relevance of curricula to labor market demands can help (Hanushek & Woessmann, 2008). In addition, there is a need for health investments tailored to improve specific outcomes while increasing access to enhance workforce productivity (Bloom et al., 2004). It is essential to study successful countries that have moved from resource-based economies to more diversified structures to learn from their effective strategies.

4.5.3. Effect of Financial Intermediation on Entrepreneurship

In this part, the second model is used to examine the financial intermediation's direct effect on entrepreneurship in resource-driven countries. This effect must be statistically significant for SEM to be applicable. POLS, RE, FE, and GMM are the appropriate panel data methodologies that have been employed to ascertain the validity of the results and to resolve any potential econometric issues such as endogeneity or heterogeneity. GMM results are a more reliable and resilient choice for interpretation, as they minimize any biases that may influence other approaches, as discussed in section 4.2.2. Table 4.24 displays the outcomes of all methodologies; however, this study relies on GMM; consequently, the findings are interpreted accordingly. The validity and acceptability of GMM model instruments are demonstrated by the Hansen test (p-value 0.966). The instruments in this analysis are generated using the second to fourth lags of the independent and control variables. As the Cragg-Donald test does not apply to GMM,

instrument strength is evaluated through first-stage regression results and Wald F-statistics, which consistently exceed the widely accepted benchmark of 10. This indicates that the instruments are reliable and not prone to weak identification. Effective instruments are those that are strongly linked to the endogenous variables while remaining uncorrelated with the error term, supporting consistent and accurate estimation. The favorable outcomes of the Hansen and Wald tests further reinforce the validity and strength of the instruments applied in this model. While the residuals show first-order autocorrelation with a p-value of 0.019 for AR(1), there is no evidence of second-order autocorrelation, as indicated by the p-value of AR(2) of 0.349. Furthermore, the dependent variable in the model is sufficiently explained by the explanatory factors, as indicated by the Wald test's p-value of 0.002.

Table 4.24: Effect of Financial Intermediation on Entrepreneurship

	Pooled OLS	**Random Effect**	**Fixed Effect**	**GMM**
Variables	lnEnt	lnEnt	lnEnt	lnEnt
lnFI	.041	.19***	.189***	.08***
	(.042)	(.01)	(.012)	(.017)
lnUN	.923***	.055***	.041***	.611**
	(.038)	(.015)	(.015)	(.099)
GE	-.883***	-.174***	-.176***	-.293***
	(.178)	(.031)	(.031)	(.073)
RL	-.448**	-.191***	-.178***	-.194***
	(.176)	(.032)	(.032)	(.047)
Cons	1.609**	9.184***	9.269***	4.827***
	(.732)	(.338)	(.301)	(.958)
Observations	543	543	543	415
Countries	29	29	29	29
Hansen Test	.966		AR(1)	.019
Wald Test	.002		AR(2)	.349

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.24 reports the estimated results using Pooled OLS, Random Effects Model (REM), Fixed Effects Model (FEM), and Generalized Method of Moments (GMM). Entrepreneurship (EG) is the dependent variable, financial intermediation (FI) is the explanatory variable, and unemployment (UN), government effectiveness (GE), and rule of law (RL) are included as control variables. The lower panel presents diagnostic tests for instrument validity and serial correlation.

The financial intermediation's impact on entrepreneurship, with a coefficient size of 0.08, implies a modest yet meaningful influence on entrepreneurial activities. This coefficient suggests that while financial intermediation positively influences entrepreneurship, the effect is relatively small. The favorable impact of financial intermediation on entrepreneurship is consistent with (Ajide, 2020; Dutta & Meierrieks, 2021) and many others in the existing literature. These findings are also corroborated with the

Schumpeterian theory of entrepreneurship which also highlights the endeavor to secure and harness financial resources as a stimulus for innovation and advancement (Schumpeter, 1911). In resource-based economies, financial intermediation is crucial as it provides the requisite financing business services and other financial products essential for business creation and expansion. Furthermore, financial intermediation helps reduce the resource curse by encouraging spending in non-resource sectors (Acemoglu et al., 2001; Beck & Levine, 2002). However, the comparatively lower status suggests that these financial services, while advantageous, their full entrepreneurial potential is stymied by other factors. Such factors include gaps in institutional frameworks, low levels of financial understanding, poor infrastructural development, lack of entrepreneurial training, or socio-economic barriers that undermine the effectiveness of financial intermediation on entrepreneurship in resource-based economies (Khandker, 2005). For this reason, these countries tend to lag behind in activities related to innovation, as seen in their new business registration and patent filing rates. The World Bank's Doing Business Report (World Bank, 2021) indicates that resource-based economies have slower rates of new business registration. For example, Nigeria ranked 131 out of 190 countries in ease of doing business, with 44,460 new businesses registered in 2020. Angola faces significant challenges in business registration, with a low number of new businesses registered annually. Botswana registered just about 1,200 new businesses in 2020, ranking 86 in the ease of starting a business. Ghana saw 9,000 new business registrations in 2020, with a ranking of 118 for ease of starting a business. Ethiopia registered 12,500 new businesses in 2020, but ranks 159 in ease of doing business (World Bank, 2021). In the same manner, WIPO (2021) data indicates that these countries have lower patent filing numbers, likely owing to a scant R&D expenditure, limited innovation spending, an overreliance on natural resources, and low investment levels. To illustrate, the resident filed patent applications in Nigeria in 2020 amounted to 160. Angola reported only 50 patent applications in 2020 which is an evidence of low innovation activities. Likewise, Botswana had 92 patent applications, Ethiopia had around 100 patent applications and Ghana filed only 126 in 2020 which reflects a still limited innovation sector. Thus, although the reports indicate some outperforming trends, many resource-driven economies continue to grapple with persistent bureaucratic red tape, exorbitant costs for business registration, lack of comprehensive legal systems, and scarce infrastructure to support new venture formation. The small coefficient value of 0.08 suggests that while financial intermediation remains a favorable pillar, it serves no primary value in driving

investment within resource-poor economies where institutional frameworks remain heavily constrained by structural rigidities. The patently and newly registered business stagnant levels point to the absence of innovational infrastructure paired with market access, excessive regulatory barriers, and infrastructure laced with innovation within financial services in these economies. To improve the underlying challenges faced by these economies, they need to focus on the financial intermediation's impact on entrepreneurship. This involves improving the institutional framework, creating an entrepreneurial venture support infrastructure, advancing entrepreneurial and financial literacy programs, as well as optimizing regulatory frameworks for easier compliance. If achieved, this would further strengthen the positive impacts of financial intermediation, resulting in increased patent applications and new company registrations and stimulating entrepreneurial activities and economic diversification.

A coefficient of 0.611 reflects the extreme positive impact unemployment has on entrepreneurship in resource-driven economies, indicating that higher unemployment may lead to increased entrepreneurial activity. This is consistent with da Fonseca (2022), who pointed out that unemployment tends to make it much more likely people will start new businesses, even doubling the chances of business creation. The relationship, described by Faria (2015), is more complex than one might think: new business formations will help reduce unemployment by creating jobs. In such scenarios, entrepreneurship is pursued out of dire economic need—what has been termed as necessity-driven entrepreneurship—with the primary aim of making ends meet (Thurik et al., 2008). While resources may provide the impetus, in resource-driven economies one could argue that greater unemployment would drive people to engage in entrepreneurial activities in sectors other than resources. This underscores the need to diversifying these economies away from over-reliance on abundant natural resources in order to foster sustainable economic development. Necessity-driven entrepreneurship is highly significant in these circumstances; these economies suffer from insufficient employment options, which compels their populace to devise innovative solutions and establish new enterprises, thus enhancing economic diversification and flexibility (Gylfason & Zoega, 2006; Baptista & Thurik, 2007; Naude, 2010). Furthermore, counter-cyclical policies of resource-driven economies tend to stimulate entrepreneurship as a means to mitigate unemployment, making such initiatives more favorable during periods of downturn. Successful entrepreneurial ventures not only reduce unemployment but also create additional

employment opportunities, leading to economic diversification, improved productivity, and innovation. Thus, while unemployment may initially push individuals into entrepreneurship out of necessity, it also serves as a mechanism for broader economic transformation and resilience.

The significant and negative influence of government effectiveness and rule of law on entrepreneurship though against their typical positive connotations (Rodriguez-Gulias et al., 2018; Ajide, 2022) but it is not a surprising outcome in resource-driven countries. This result shows that generally the perception of people regarding effectiveness of the government and rule of law is negative in these countries. This counterintuitive result is in line with a large body of knowledge, for instance (Friedman, 2011; Aisen & Veiga, 2013; Obaji & Olugu, 2014; La Porta & Shleifer, 2014; Guerrero et al., 2021; Audretsch et al., 2022) who have demonstrated that entrepreneurial activities can be suppressed in environments where regulatory frameworks are inefficiently implemented. Resource-driven economies often grapple with high levels of corruption. Strengthening the rule of law might disrupt established informal practices and networks that entrepreneurs rely on. While intended to create a fairer business environment, these changes can lead to uncertainty and reduced business activities in the short term as entrepreneurs navigate new, unfamiliar legal landscapes (Fisman & Svensson, 2007). These economies often rely heavily on natural resource rents, which can distort economic incentives. Effective governance and strict legal frameworks might inadvertently prioritize resource management and extraction over the development of other sectors, including entrepreneurship. This can limit opportunities for new business creation outside the resource sector (Auty, 2001). In some resource-dependent countries, improvements in governmental effectiveness and compliance to the rules and laws where scrutiny and regulation already exists, could lead to increased red tape and bureaucratic processes. Entrepreneurs may view this increased regulation to be more complex and stringent as a barrier instead of support. If the regulatory regime is not conducive to business, this situation could lead to an environment that discourages entrepreneurship, particularly where compliance costs are elevated (Djankov et al., 2002). Improving effectiveness of governance and the rule of law may illustrate a problem to a system that resists change and adapts poorly to stronger institutional configurations. Entrepreneurs may fear some form of punishment, or no support from powerful stakeholders whose interests rely on weakened governance structures, possibly undermining their jurisdictional authority. The

result is diminished initiative and activity (Acemoglu & Robinson, 2012). The adverse consequences for entrepreneurship indicates the degree of sensitivity resource dependent economies need to improve these issues. Appropriate policies create a clear distinction between effective governance and the rule of law balanced with adequate provisions to incentivize entrepreneurial activities. Focus on innovative social and economic policies that provide responsive governance while defending constituencies' rights should restore fairness and equality of opportunity. This will lessen the adverse impacts whereby regulatory framework becomes overly complicated.

4.5.4. Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth

This section looks into how entrepreneurship mediates the association of financial intermediation with growth of the efficiency-driven economies. Moderated mediation approach, as described by Muller et al. (2005) is used to achieve the objectives. Structural equation modeling (SEM) is utilized to estimate all regression models simultaneously, allowing for an in-depth understanding of the interrelationships among these variables (Awang, 2014).

4.5.4.1. Structural Equation Modeling (SEM)

Table 4.25 displays the structural equation modeling results.

Table 4.25: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.085	.010	7.82	.000
lnFI	.067	.015	4.32	.000
lnPE	.387	.022	17.54	.000
lnI	.496	..026	19.32	.000
HD	.122	.156	0.78	.433
Cons	1.551	1.585	9.79	.000
lnENT ←				
lnFI	.082	.042	1.95	.051
lnUN	.877	.039	22.14	.000
GE	-1.089	.184	-5.89	.000
RL	-.478	.176	-2.71	.007
Cons	1.249	.735	1.70	.089

LR test of model vs. saturated: $chi^2(6) = 428.37$, Prob > $chi^2 = 0.0000$

Table 4.25 presents the estimation results from Structural Equation Modeling (SEM) when Entrepreneurship (Ent) is included as a mediator. The regression models are estimated simultaneously and the associations among variables are examined at the same time. The p-values indicate the significance levels of the estimated relationships.

The findings of the structural equation modeling (SEM) demonstrate that financial intermediation's impact on growth of resource-driven economies is positive (p-value 0.000). The value of coefficient is 0.067, which is representing this direct impact. This shows that financial intermediation directly supports economic growth; however the coefficient size is modest. The modest coefficient may be due to the limited diversification of these economies beyond resource extraction sectors. Simultaneously, when entrepreneurship is entered in the model as a mediator, financial intermediation has a positive impact on entrepreneurship at 10% level of significance with p-value 0.051, which is weak and representing negligible impact of financial intermediation on entrepreneurship. This suggests that while financial intermediation is crucial for growth, its role in directly fostering entrepreneurship is limited in these economies. One reason could be the structural characteristics of resource-driven economies, where the financial system may be more aligned with funding large, established enterprises in the resource sector rather than promoting small and medium-sized enterprises (SMEs) or startups (Dutta & Meierrieks, 2021). Moreover, high levels of perceived risk, weak institutional frameworks, and the dominance of the resource sector could deter financial institutions from extending credit to new, innovative businesses, resulting in limited impact on entrepreneurship (Beck et al., 2005). The findings clearly demonstrate that entrepreneurship significantly effects economic growth (p-value 0.000). The positive coefficient 0.085 represents the direct impact of entrepreneurship. In resource-driven

countries, entrepreneurship can provide alternative sources of growth and reduce dependence on volatile resource markets. The coefficient compared to financial intermediation's direct effect suggests that the growth benefits of entrepreneurship are more substantial. This view supports the findings of Acs et al. (2013) and Kim et al. (2022), who also emphasized the importance of entrepreneurship in driving economic growth through innovation, market competition, and structural change. The overall findings of SEM align with the earlier findings of GMM analysis.

4.5.4.2. Testing Mediation

The mediation analysis is conducted by employing a methodology originally proposed by Baron and Kenny (1986) and Kenny (2024). This methodology involves three fundamental procedures, as described in Chapter 3, which are necessary for showing mediation. Table 4.26 presents the results of the mediation analysis.

Table 4.26: Baron and Kenny approach & Sobel's Test

Estimates	**Delta**	**Sobel**
Indirect effect	0.007	0.007
Std. Err.	0.004	0.004
z-value	1.890	1.890
p-value	0.059	0.059
Conf. Interval	-0.000 , 0.014	-0.000 , 0.014

STEP 1: lnENT:lnFI (X → M); β=0.082 ; p=0.051
STEP 2: lnEG:lnENT(M → Y) ; β =0.085 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.076 ; p=0.000
As Step-1 as well as Sobel's test are insignificant , there is ***No Mediation***

Table 4.26 presents the indirect effect of financial intermediation (FI) on economic growth (EG) through the mediating role of entrepreneurship (Ent) by reporting the three steps of Baron and Kenny approach. The significance of this mediation is evaluated using Sobel's test, with p-values indicating statistical relevance.

The outcome clearly shows that financial intermediation has a direct impact of 0.076 on economic growth, as indicated by its coefficient. Since this effect is statistically significant, it must be mediated. On the other hand, the direct effect of financial intermediation on entrepreneurship is 0.082; however, Barron and Kenny deem this insignificant because the p-value is higher than 0.05. Moreover, the coefficient 0.085 represents the entrepreneurship's impact on economic growth. It is determined that the indirect effect of financial intermediation on economic growth through the channel of entrepreneurship is 0.007 i.e. (0.082 x 0.085) which is almost zero and thus providing an evidence of no mediation in resource-driven countries. As first step of Barron and Kenny

approach is insignificant therefore entrepreneurship does not play any mediating role between financial intermediation and growth of resource-driven economies.

4.5.4.3. Validating Mediation through Sobel's Test

Sobel's (1987) z-test is used to assess the statistical significance of the mediation effect in order to validate the mediation results. It is inferred from the Table 4.26 that the z-value calculated from Sobel's test is 1.89 which is less than ± 1.96 and is also insignificant with p-value 0.059 so it is confirmed that there is no mediation.

4.5.4.4. Validating Mediation through Zhao's Test

For further confirmation of the statistical significance of the mediation effect, an approach proposed by Zhao et al. (2010) is applied. The results of this approach are illustrated in the Table 4.27.

Table 4.27: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	0.007	0.007
Std. Err.	0.004	0.004
z-value	1.890	1.884
p-value	0.059	0.060
Conf. Interval	-0.000 , 0.014	-0.000 , 0.014

STEP 1- lnEG:lnFI (X → Y) with β =0.067 and p=0.000

As the Monte Carlo test above is not significant and STEP 1 is significant you have direct-only nonmediation **(No Mediation)**

Table 4.27 presents the mediating role of entrepreneurship(Ent) between financial intermediation(FI) and economic growth(EG) by reporting the steps of Zhao, Lynch & Chen's approach. The significance of this mediation is evaluated using Monte Carlo test, with p-values indicating statistical relevance.

It is apparent from Table 4.27 that the Monte Carlo test is insignificant with p-value 0.06 and the confidence interval is almost zero, therefore, it is determined that entrepreneurship does not play any mediating role between financial intermediation and growth of resource-driven economies.

Resource-driven countries are often heavily reliant on natural resources like oil, minerals, or agriculture, leading to limited economic diversification. As a result, the financial sector tends to focus on supporting large, established firms in the resource sectors rather than fostering small and medium-sized enterprises (SMEs) or innovative startups. This

structural limitation reduces the capacity of financial intermediation to drive entrepreneurship that could spur economic growth (Auty, 2001). Additionally, the underdeveloped entrepreneurial ecosystems in these countries, characterized by weak institutional support, inadequate infrastructure, and restricted market access, limit the potential for entrepreneurship to emerge as a significant mediator. Though financial intermediation might enhance the aggregate availability of capital, the relationship through which entrepreneurship would channel economic growth is still weak in the context of the supporting environment for startups (Beck & Demirgüç-Kunt, 2006). The combination of high levels of informality with considerable formal market entry barriers further stifles entrepreneurial activity, impeding the impact financial intermediation has to promote entrepreneurial activities. For this reason, these financial institutions tend to be conservative and focus on low-risk opportunities in mature industries instead of funding new and high-risk projects (Djankov et al., 2002; Hausmann & Klinger, 2007).

The Global Entrepreneurship Monitor (GEM, 2023) report detailing total early-stage entrepreneurial activity (TEA) from resource-based countries adds context to their findings. Angola, for instance, has a TEA rate of approximately 27.5% which indicates a high level of entrepreneurial activity, but largely out of economic necessity owing to scarce jobs outside the resource industry. On the contrary, Botswana has a TEA rate of close to 11.1% where entrepreneurial activity is more opportunity-driven because of a modestly stable economy. Ethiopia, with a TEA of 17.9%, reflects the same high necessity TEA along with Nigeria, standing at 39.9%, both countries suffer from volatile economies. Ghana's TEA estimate is 24.6%, suggesting considerable entrepreneurial activity although the majority operates in the informal economy because of difficulty in obtaining formal financial services and market access. These figures illustrate that intermediation exists, but the directional causality between entrepreneurship and economic growth is limited due to ineffective investment mediation and weakening institutional frameworks.

This result underscores the weak or absent mediation of entrepreneurship in resource-driven economies and serves the study’s purpose by marking a contrast with innovation-driven and efficiency-driven economies. It shows that fostering entrepreneurship’s role in economic growth goes far beyond financial intermediation; it demands a complete ecosystem that nurtures and bolsters entrepreneurial activities. These findings suggest that

the innovation-driven and efficiency-driven economies operate under a different set of dynamics with regard to the interrelationship between financial systems and entrepreneurial ecosystems than those found in resource-driven contexts, where such relationships are constrained by particular structural and market limitations. Therefore, while TEA rates might be high, especially in economies where entrepreneurship is a necessity, the actual impact on economic growth remains limited without supportive policies and a well-structured financial and business environment.

4.6. Heterogeneity Analysis

Through heterogeneity analysis, this part aims to examine contextual and developmental differences with regard to the relation of financial intermediation, entrepreneurship, and economic growth. Such differences include the quality of governance, the institutional framework, and the stage of economic development. Thus, this section first investigates the issue by incorporating additional proxies for financial intermediation and entrepreneurship into the main models. However, using alternate proxies do not reveal any meaningful differences in the results and the core findings largely remain unchanged despite the introduction of alternative proxies, this illustrates the robustness of the original results. Therefore, the study expands the scope of analysis by calculating country-specific cross-section effects with Fixed Effects Model (FEM) and Generalized Method of Moments (GMM) techniques. This allows accounting for certain country-specific factors that are difficult to capture through aggregate estimates. A comprehensive analysis of results obtained from heterogeneity analysis will be presented in the next sections.

4.6.1. Heterogeneity Analysis Using Different Proxies

This section explores the relationship between financial intermediation, entrepreneurship, and economic growth by introducing alternative proxies to capture potential differences across different economies. In the main analysis, the credit-to-GDP ratio served as the primary proxy for financial intermediation, and self-employment as a percentage of total employment was used to represent entrepreneurship. The outcomes based on these proxies are reported in Model-1A and Model-2A of Table 4.28, with detailed discussions already provided earlier.

To broaden the analysis, the study incorporates alternative measures: bank credit to the private sector as a percentage of GDP for financial intermediation, reflecting the flow of financial resources towards private sector activities (Levine et al., 2000), and new firm registrations as a proxy for entrepreneurship, indicating formal entrepreneurial activity while acknowledging that it may not fully capture informal sector dynamics (Reynolds et al., 2005). Table 4.28 presents the results based on these new proxies alongside the original findings. This extension tests the robustness of the earlier conclusions and offers

a broader understanding of how financial intermediation and entrepreneurship relate to economic growth in innovation-driven countries.

Table 4.28: Effect of Financial Intermediation on Economic Growth and Entrepreneurship Using Different Proxies

	Model-1A	**Model-1B**	**Model-2A**	**Model-2B**
Variables	lnEG	lnEG	lnEnt	lnEnt
lnFI	.05***	.034***	.22***	.653***
	(.013)	(.008)	(.045)	(.079)
lnI	.29***	.277***		
	(.021)	(.011)		
lnPE	.331***	.328***		
	(.026)	(.017)		
HD	.861***	1.94***		
	(.274)	(.124)		
lnUN			.769***	.137**
			(.053)	(.068)
GE			-.557***	-.585**
			(.163)	(.275)
RL			-.407**	.309
			(.162)	(.384)
Cons	8.882***	8.781***	-.784	-8.355***
	(.382)	(.282)	(.655)	(2.199)
Observations	1369	1606	1459	748
Countries	84	84	84	76
Hansen Test	.254	.317	.369	.163
Wald Test	.000	.000	.000	.026
AR(1)	.004	.009	.017	.048
AR(2)	.969	.893	.748	.062

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 4.28 presents four different models. In Model-1A, financial intermediation (FI) is measured by the credit to GDP ratio, while in Model-1B, it is measured by banks' credit to the private sector. Both models examine the impact of FI on economic growth (EG), incorporating private investment (I), public expenditure (PE), and human development (HD) as control variables. In Model-2A, entrepreneurship (Ent) is represented by the self-employment rate, whereas in Model-2B, it is represented by the number of new firm registrations. Models 2A and 2B analyze the relationship between financial intermediation and entrepreneurship, with unemployment (UN), government effectiveness (GE), and rule of law (RL) included as control variables. The lower part of the table provides diagnostic tests for instrument validity and serial correlation.

The diagnostic tests performed confirm the validity and reliability of the estimated models. The Hansen J-statistic reported across all four models indicates that the instruments used are valid and uncorrelated with the error term, thereby satisfying the over-identification restrictions. The Arellano-Bond test for first-order autocorrelation (AR(1)) detects some expected correlation in the differenced residuals; however, the absence of significant second-order autocorrelation (AR(2)) confirms that the models are correctly specified regarding the choice of lagged instruments. Additionally, the Wald test

supports the joint significance of the explanatory variables, reinforcing the statistical soundness of the models.

Model-1A and Model-1B estimate the effect of financial intermediation on economic growth at the global level. A comparison of these two models reveals that the results are remarkably consistent, both in terms of the direction and significance of the estimated effects. Only a negligible difference appears in the magnitude of the coefficients. Financial intermediation continues to exhibit a significant positive impact on economic growth regardless of whether it is measured through credit to GDP ratio or banks' credit to the private sector. This stability in findings highlights the robustness of the original results and suggests that changing the proxy for financial intermediation does not substantially alter the conclusions. Therefore, heterogeneity analysis based on the use of different proxies for financial intermediation is not considered meaningful.

Similarly, the findings from Model-2A and Model-2B, which assess the relationship between financial intermediation and entrepreneurship, show that financial intermediation maintains a significant positive effect on entrepreneurship even when new firm registration is used as an alternative proxy for entrepreneurial activity. However, it is important to note that the dataset for new firm registration is limited to the period from 2006 to 2020 extracted from world development indicators (WDI) of the World Bank, resulting in a reduced number of observations. Moreover, missing data for several countries within the panel has led to a smaller number of cross-sections. Consequently, the reliability of the results based on new firm registration is somewhat weaker compared to the main analysis. The insignificance of the rule of law variable in this alternative specification may also be attributed to the reduced sample size. Nevertheless, the overall pattern of the relationship between financial intermediation, economic growth, and entrepreneurship remains consistent with the original findings.

Given that changing the proxies does not introduce significant new insights into the analysis and in order to better capture variations across countries, the study proceeds by estimating country-specific cross-section effects, which forms the basis of the heterogeneity analysis discussed in the following section.

4.6.2. Heterogeneity Analysis Using Country Specific Cross Section Effects

The table 4.29 captures country-specific cross-section effects derived from the Fixed Effects Model (FEM) and the Generalized Method of Moments (GMM) employed for heterogeneity analysis to further understand the nexus between financial intermediation, entrepreneurship and economic growth that vary across countries, driven by a range of institutional, structural, and policy-specific factors. The cross section effects estimated through these methods enable a broader understanding of how country specific characteristics shape outcomes, with FEM capturing time invariant structural features and GMM addressing endogeneity through dynamic modeling, including lagged variables and macroeconomic policy effects. Consequently, GMM estimates are generally prioritized for interpretation due to their ability to handle simultaneity bias, while FEM serves as a comparative benchmark for structural insights.

Table 4.29: Country Specific Cross Section Effects (FULL PANEL)

Countries	Model-1		Model-II		Countries	Model-I		Model-II	
	FEM	GMM	FEM	GMM		FEM	GMM	FEM	GMM
Australia	0.467	0.434	0.401	0.481	Latvia	-0.987	-0.676	-2.115	-1.949
Austria	0.042	0.092	-0.701	-0.561	Luxembourg	-0.743	-0.416	-3.717	-3.429
Belgium	0.047	0.103	-0.533	-0.415	Mexico	1.128	0.847	2.258	2.130
Canada	0.618	0.536	0.682	0.759	Montenegro	-1.818	-1.338	-3.029	-2.924
China	1.836	1.127	5.045	4.698	Panama	-0.561	-0.429	-0.697	-0.672
Croatia	-0.625	-0.453	-1.189	-1.198	Peru	0.234	0.181	1.778	1.696
Czech Republic	-0.257	-0.151	-0.307	-0.197	Philipines	0.639	0.436	2.400	2.306
Denmark	-0.160	-0.065	-1.429	-1.266	Russia	0.963	0.688	1.035	0.782
Estonia	-1.186	-0.834	-2.676	-2.501	Saudi Arabia	0.425	0.286	-1.020	-1.117
Finland	-0.254	-0.118	-1.064	-0.850	Serbia	-0.588	-0.426	-0.264	-0.341
France	0.896	0.668	0.718	0.712	South Africa	0.616	0.302	0.381	0.262
Germany	0.991	0.824	1.074	1.071	Thailand	0.492	0.253	2.566	2.479
Japan	1.169	0.877	1.596	1.512	Uruguay	-0.421	-0.226	-0.818	-0.728
South Korea	0.646	0.525	1.593	1.543	Angola	0.492	0.225	1.796	1.622
Lithuania	-0.770	-0.478	-1.775	-1.619	Bangladesh	0.860	0.513	3.099	2.886
Malaysia	0.262	0.187	0.797	0.864	Barbados	-1.521	-1.039	-3.499	-3.191
Netherlands	0.268	0.255	0.033	0.162	Belize	-1.833	-1.390	-3.125	-2.986
Norway	-0.108	0.010	-1.755	-1.570	Bolivia	-0.424	-0.393	0.864	0.792
Poland	0.301	0.279	1.085	0.992	Botswana	-0.967	-0.860	-1.667	-1.484
Portugal	-0.020	0.001	-0.116	-0.094	Burkina Faso	-0.122	-0.446	1.676	1.656
Qatar	0.058	0.061	-4.945	-4.757	Cameroon	0.096	-0.103	1.768	1.698
Singapore	-0.039	0.107	-0.944	-0.676	Ethiopia	-0.327	-0.469	3.161	3.087
Slovakia	-0.455	-0.293	-1.086	-1.019	Ghana	0.097	-0.041	2.071	2.067
Slovenia	-0.891	-0.562	-1.762	-1.651	Guatemala	0.192	0.080	0.599	0.502
Spain	0.647	0.502	0.746	0.681	Jordan	-0.684	-0.553	-1.682	-1.646
Sweden	-0.005	0.055	-0.802	-0.676	Kazakhstan	0.179	0.240	0.471	0.390
Switzerland	0.299	0.363	-0.545	-0.395	Lebanon	-0.471	-0.366	-0.949	-0.977
Turkey	0.750	0.497	1.691	1.536	Libya	-0.434	-0.145	-0.811	-0.981
United Arab Emirates	0.254	0.303	-1.608	-1.418	Madagascar	-0.428	-0.538	2.182	2.173
United Kingdom	1.004	0.825	0.998	1.017	Morocco	0.015	-0.221	1.360	1.233
United States	1.816	1.423	1.631	1.507	Namibia	-0.932	-0.869	-1.377	-1.323
Algeria	0.139	0.016	0.785	0.647	Nigeria	1.534	0.974	3.231	2.993
Argentina	0.610	0.565	1.017	0.883	Pakistan	1.150	0.687	3.081	2.952
Bosnia	-1.026	-0.834	-1.549	-1.643	Senegal	-0.126	-0.367	0.857	0.844
Greece	-0.027	0.048	0.088	0.023	Suriname	-1.458	-1.139	-3.379	-3.261
Hong Kong	0.047	0.184	-1.142	-0.980	Syria	-0.294	-0.255	0.719	0.610
Hungary	-0.284	-0.196	-0.706	-0.701	Tonga	-2.525	-1.900	-3.558	-3.351
Iceland	-1.485	-1.006	-3.335	-3.046	Tunisia	-0.449	-0.426	-0.242	-0.246
Ireland	-0.182	-0.023	-1.133	-1.006	Uganda	0.163	-0.039	2.333	2.287
Israel	-0.175	-0.049	-1.163	-1.045	Vanuatu	-2.054	-1.721	-2.287	-2.119
Italy	0.899	0.710	1.1825	1.034	Vietnam	0.488	0.313	3.083	2.927
Jamaica	-0.866	-0.661	-0.742	-0.667	Zambia	-0.335	-0.512	1.449	1.380

Table 4.29 reports country-specific cross-section effects derived from Fixed Effects Model (FEM) and Generalized Method of Moments (GMM) across the global panel of eighty four countries. Model-I examines economic growth, while Model-II focuses on entrepreneurship, with financial intermediation as the explanatory variable in both, along with control variables discussed earlier.

The discussion presented in the analysis relies on standardized statistical figures sourced from the official reports of the World Bank, International Monetary Fund, Organisation for Economic Co-operation and Development, and the United Nations Development Programme (World Bank, 2023; IMF, 2023; OECD, 2023; UNDP, 2023).From the perspective of economic growth, among the highly advanced economies, the United States (FEM: 1.816, GMM: 1.423) stands out due to its highly developed financial markets, with a Financial Development Index (FDI) of 0.88, stock market capitalization exceeding 160% of GDP, and economic growth rate of 2.1% in 2023 (World Bank, 2023; IMF, 2023). Its strong institutional frameworks, deep capital markets, and sophisticated

regulatory environment enable efficient financial intermediation, while public expenditure accounts for 37.8% of GDP, and its Human Development Index (HDI) of 0.921 reflects strong human capital accumulation (UNDP, 2023). Similarly, China (FEM: 1.836, GMM: 1.127) benefits from rapid financial sector growth, a financial development index of 0.76, increasing private investment, and an HDI of 0.768. China's banking sector dominates financial intermediation, with commercial banks holding 90% of total financial assets, while its stock market, though expanding, remains secondary in capital allocation (Cheng et al., 2025). Germany (FEM: 0.991, GMM: 0.824) also demonstrates high fixed effects due to its robust financial markets, an FDI of 0.85, and a highly efficient banking system that provides credit access to SMEs, reinforcing its stable 1.7% economic growth (Huang et al., 2023). Japan (FEM: 1.169, GMM: 0.877), despite an aging population, maintains a highly liquid financial sector supported by pension funds and central bank interventions, with an HDI of 0.925 ensuring continued economic productivity (Tanaka, 2024). In contrast, Switzerland (FEM: -0.299, GMM: 0.363) and Sweden (FEM: -0.005, GMM: 0.035), despite their highly sophisticated financial institutions and financial literacy rates above 80%, show only moderate fixed effects, indicating that financial development alone is insufficient to drive growth in economies with high regulatory burdens and matured industrial sectors (Challoumis, 2024). The table highlights the importance of heterogeneity analysis in explaining why economies react differently to financial intermediation, investment, public spending, and human development. The variations across the 84 countries examined underscore differences in financial system maturity, banking sector efficiency, stock market depth, and access to credit, emphasizing the role of institutional quality, regulatory frameworks, and structural economic conditions in shaping financial development's impact on growth.

The middle income countries such as South Korea (FEM: 0.646, GMM: 0.525) demonstrates strong positive effects, underpinned by an advanced technological ecosystem, financial innovation, and a well-regulated credit market. With an FDI of 0.84, South Korea benefits from high financial inclusion, particularly in digital banking and fintech-driven services (Nam & Lee, 2023). In contrast, Spain (FEM: 0.647, GMM: 0.502) and Italy (FEM: 0.899, GMM: 0.710) exhibit relatively strong fixed effects but face challenges from legacy debt burdens and slow labor market reforms (Cárdenas et al., 2024). France (FEM: 0.896, GMM: 0.666), with a financial development index of 0.79, maintains a stable credit environment, yet its economic model relies heavily on state

intervention, which sometimes limits financial market dynamism (Massoc, 2022). The Netherlands (FEM: 0.268, GMM: 0.255) demonstrates a stable financial system but exhibits neutral cross-section effects, suggesting that its growth is largely driven by trade integration rather than financial intermediation alone (Mtar & Belazreg, 2023).

Some economies display more pronounced heterogeneity due to their dependence on commodity cycles, governance quality, and financial sector development. Nigeria (FEM: 1.534, GMM: 0.974), despite a weak financial development index of 0.42, benefits from high oil revenues and achieves 3.1% economic growth; however, its financial markets remain underdeveloped, with stock market capitalization below 20% of GDP, limited banking penetration, and high interest rate spreads that constrain private investment. Private sector credit accounts for less than 15% of GDP, highlighting chronic credit access issues (Bolarinwa et al., 2021). Similarly, Angola (FEM: 0.492, GMM: 0.225) remains highly dependent on oil exports, with an underdeveloped financial sector that lacks financial deepening, leading to economic volatility (Wanda et al., 2023). Kazakhstan (FEM: 0.179, GMM: 0.240), although gradually improving its financial market structure through government-led structural reforms, faces institutional weaknesses and a history of banking crises that limit the efficiency of credit allocation (Amirbekova et al., 2022). While these resource-rich economies exhibit strong positive fixed effects, their weaker financial intermediation systems hinder long-term economic stability and investment-led growth.

Several economies with inefficient financial systems and weak governance experience negative fixed effects due to weak financial infrastructure, poor governance, and limited access to formal financial services. Tonga (FEM: -2.525, GMM: -1.900) shows the lowest values in the panel, with its financial system playing a negligible role in economic development, an FDI of just 0.35, and economic growth of only 1.5%. Similarly, Vanuatu (FEM: -2.054, GMM: -1.721) faces low financial inclusion, high dependency on remittances, and a fragile banking sector, further limiting its economic expansion (Chen, 2022). Belize (FEM: -1.833, GMM: -1.390) struggles with a fragile banking system, constrained credit access, and a high debt-to-GDP ratio, making its financial sector highly vulnerable to external shocks and limiting investment-led growth. In Africa, Burkina Faso (FEM: -1.022, GMM: -0.446) and Botswana (FEM: -0.967, GMM: -0.860) illustrate the adverse effects of underdeveloped financial markets, where bank lending is constrained,

formal banking penetration is below 30%, and informal credit dominates economic transactions (Ouedraogo & Sawadogo, 2022). Even middle-income economies such as Morocco (FEM: 0.015, GMM: -0.221) demonstrate mixed effects, as financial markets are expanding but remain dominated by state-controlled banking institutions, limiting private sector-led investment (Kchikeche & Khallouk, 2021). These structural weaknesses hinder economic growth and financial integration, exacerbating economic vulnerabilities in these countries.

Some advanced economies, despite strong financial systems, display relatively weaker cross-section effects, indicating that financial deepening alone is not sufficient to sustain high growth. Iceland (FEM: -1.485, GMM: -1.006) continues to recover from its past banking crisis, with lingering concerns over financial stability despite an FDI of 0.67 and an HDI of 0.935. Switzerland (FEM: 0.299, GMM: 0.363) showcases a well-developed financial sector with an FDI of 0.91 and a highly capitalized banking system, yet its economic growth remains subdued at 1.2% due to global financial uncertainties and an aging population. Sweden (FEM: -0.005, GMM: 0.035) also exhibits neutral fixed effects despite its sophisticated financial markets, as high taxation and regulatory frameworks moderate growth. Meanwhile, some countries with strong financial sectors but structural challenges, such as Greece (FEM: -0.027, GMM: 0.048), continue to struggle with high public debt and credit constraints despite improved banking sector stability.

Turning to entrepreneurship, the table reveals substantial cross-country variation, confirming the heterogeneous influence of explanatory variables on entrepreneurship across different economies. Countries like Turkey (FEM: 1.691, GMM: 1.536), Argentina (1.017, 0.883), and China (5.045, 4.698) show strong positive effects, suggesting a favorable environment for entrepreneurship, likely influenced by robust financial markets, increasing unemployment as a push factor, and dynamic private sectors (González & Blinder, 2022). China, in particular, has experienced rapid entrepreneurship growth, aligned with its Total Early-Stage Entrepreneurial Activity (TEA) rate of around 10–14% in recent years, supported by aggressive digital financing mechanisms like Ant Financial and wide access to credit despite relatively weaker institutional settings (Zhoua & Zhub, 2022). Conversely, countries such as Qatar (-4.945, -4.757), Singapore (-0.944, -0.676), and Denmark (-1.429, -1.266) display significantly negative cross-sectional effects. In high-income countries like Singapore and Denmark, the quality of institutions

is among the highest globally, Singapore ranks near the top in government effectiveness and rule of law (World Bank, 2023) which might suppress necessity-driven entrepreneurship while favoring innovation-driven startups. This aligns with the model's finding that strong governance structures and rule of law can negatively impact the volume of entrepreneurship, especially in settings where informal or necessity entrepreneurship is less prevalent.

The innovation driven country United Arab Emirates (-1.608, -1.418) and the efficiency driven country Saudi Arabia (-1.020, -1.117) shows negative effects. Despite having strong financial systems and government support for entrepreneurship (e.g., Saudi Vision 2030, UAE's National Innovation Strategy), the influence of conservative institutional norms and restrictive labor laws may constrain broader entrepreneurial engagement, particularly among youth and women. Their high levels of government control may also dampen informal or grassroots entrepreneurial activity (Balawi, 2021). Emerging economies such as Bangladesh (3.099, 2.886) and Nigeria (3.231, 2.993) report strong positive cross-sectional effects. In these contexts, high unemployment rates and Bangladesh's youth unemployment hovering around 11% and Nigeria's overall rate exceeding 30% often serve as a push factor for entrepreneurship. Financial intermediation, though limited, is growing through microfinance and fintech platforms, creating new entrepreneurial spaces despite weaker governance (Mehta et al., 2022).

Among resource-driven economies, Peru (1.778, 1.696) and Morocco (1.360, 1.233) show consistent positive impacts, which may be tied to sectoral entrepreneurship in mining and agriculture, as well as efforts to expand SME financing. Conversely, Botswana (-1.667, -1.484) and Tunisia (-0.242, -0.246) indicate institutional or market limitations despite relatively developed financial systems. Interestingly, innovation-driven economies such as France (0.718, 0.712), Germany (1.074, 1.071), and United States (1.631, 1.507) display strong and consistent positive effects. These countries combine solid financial markets, moderate unemployment, and institutional frameworks that while strong still accommodate entrepreneurial flexibility and innovation. The TEA rate in the U.S., for example, hovers between 15–17%, supported by a dynamic VC market and cultural inclination toward risk-taking. On the other end, Ireland (-1.133, -1.006) and Sweden (-0.802, -0.676) reveal negative effects despite their developed economies and high innovation indexes. In such economies, entrepreneurship may be

more selective, innovation-intensive, and less frequent, resulting in lower overall early-stage activity despite high-quality institutions and financial access. This reflects the distinction between entrepreneurship quantity and quality, where institutions may filter for high-value entrepreneurship, thereby reducing average participation rates.

The nexus between financial intermediation, entrepreneurship and economic growth is non-linear and contingent upon national contexts. Heterogeneity analysis reveals important differences in how financial intermediation, entrepreneurship, and growth interact across countries by using country-specific estimates. Instead of assuming that all countries respond similarly, this approach highlights how unique national factors such as institutional quality, economic structure, or policy environment can lead to varied outcomes, offering a more accurate and detailed understanding of these relationships. Countries with flexible financial systems, increasing unemployment, and moderate control by institutions have high rates of entrepreneurial activity. On the other hand, effective governance and strong rule of law, although critical for the long-term health of the economy, tend to constrain specific types of entrepreneurship particularly in the economies where informal businesses are heavily regulated. Hence, policies aimed at these countries should be designed based on the conditions of each country tailored to bolster access to finance while strengthening the institutions that impact more effective and meaningful entrepreneurship which leads to sustained economic growth.

4.7. Summary of Key Findings

Global Analysis				
Model	**Data**	**Objective**	**Tool**	**Key Findings**
Model 1	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Economic Growth	GMM	Financial intermediation has a significant positive impact on economic growth. Control variables: investment, public expenditure, and human development also positively influence growth.
Model 2	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Entrepreneurship	GMM	Financial intermediation significantly boosts entrepreneurship. Unemployment also has a positive effect, while government effectiveness and rule of law negatively impact entrepreneurship.
Model 3	Panel 84 countries Time 1996-2020	Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth	SEM	Entrepreneurship partially mediates the relationship. About 29% of the effect of financial intermediation on economic growth occurs through entrepreneurship. The mediated effect is 0.4 times larger than the direct effect.
Analysis of Innovation Driven Countries				
Model	**Data**	**Objective**	**Tool**	**Key Findings**
Model 1	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Economic Growth	GMM	Financial intermediation has a significant positive impact on economic growth. Control variables: investment, public expenditure, and human development also positively influence growth.
Model 2	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Entrepreneurship	GMM	Financial intermediation significantly boosts entrepreneurship. Unemployment and rule of law also have a positive effect, while government effectiveness negatively impact entrepreneurship.
Model 3	Panel 84 countries Time 1996-2020	Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth	SEM	Entrepreneurship partially mediates the relationship. About 18% of the effect of financial intermediation on economic growth occurs through entrepreneurship. The mediated effect is 0.2 times larger than the direct effect.
Analysis of Efficiency Driven Countries				
Model	**Data**	**Objective**	**Tool**	**Key Findings**
Model 1	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Economic Growth	GMM	Financial intermediation has a significant positive impact on economic growth. Control variables: investment, public expenditure, and human development also positively influence growth.
Model 2	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Entrepreneurship	GMM	Financial intermediation significantly boosts entrepreneurship. Unemployment and government effectiveness also have a positive effect, while rule of law negatively impact entrepreneurship.
Model 3	Panel 84 countries Time 1996-2020	Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth	SEM	Entrepreneurship partially mediates the relationship. About 38% of the effect of financial intermediation on economic growth occurs through entrepreneurship. The mediated effect is 0.6 times larger than the direct effect.
Analysis of Resource Driven Countries				
Model	**Data**	**Objective**	**Tool**	**Key Findings**
Model 1	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Economic Growth	GMM	Financial intermediation has a significant positive impact on economic growth. Control variables: investment and public expenditure also positively influence growth, whereas human development is insignificant.
Model 2	Panel 84 countries Time 1996-2020	Effect of Financial Intermediation on Entrepreneurship	GMM	Financial intermediation significantly boosts entrepreneurship. Unemployment also has a positive effect, while government effectiveness and rule of law negatively impact entrepreneurship.
Model 3	Panel 84 countries Time 1996-2020	Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth	SEM	Entrepreneruship does not play a mediating role between financial intermediation and economic growth

CHAPTER – 5

RESULTS AND DISCUSSION: THE CASE OF PAKISTAN

5.1. Introduction

This chapter presents Pakistan's empirical analysis, which has three models. The first model evaluates the relationship between financial intermediation and economic growth. The second one focuses on financial intermediation and entrepreneurship. The third model examines the mediating role of entrepreneurship in the relationship between financial intermediation and economic growth of Pakistan. The analysis is based on time series data for Pakistan from 1996 to 2020. The chapter is organized into independent sections. In Section 5.2, unit root tests are conducted to measure the stationarity of the variables. This step is important in establishing the reliability of the analysis that follows. In 5.3, the direct impact of financial intermediation on the growth of Pakistan's economy is analyzed using ARDL. Section 5.4 focuses on the direct impact of financial intermediation on entrepreneurship in Pakistan. In 5.5, the focus shifts to examining the mediating role of entrepreneurship in the relationship between financial intermediation and economic growth of Pakistan. This section deepens the understanding of interrelations among these variables using structural equation modeling for mediation analysis.

5.2. Descriptive Statistics

Table 5.1: Time Series Data Descriptive Statistics

Variables	Obs	Mean	Max	Min	SD	Sk	K
lnEG	25	26.051	26.499	25.597	0.298	-0.461	1.768
lnENT	25	17.281	17.516	16.967	0.180	-0.292	1.655
lnFI	25	24.483	24.836	24.107	0.232	-0.102	1.786
lnI	25	23.955	24.383	23.530	0.253	-0.617	1.882
lnPE	25	23.562	24.267	22.986	0.388	0.136	1.723
lnUN	25	13.268	15.021	12.229	1.046	0.658	1.655
HD	25	0.497	0.558	0.431	0.041	-0.14	1.750
GE	25	-0.602	-0.375	-0.817	0.138	-0.292	1.761
RL	25	-0.801	-0.625	-0.968	0.091	0.155	2.064

Table 5.1 presents the descriptive statistics for the variables used in the time series analysis of Pakistan comprising 25 observations. The table includes the number of observations (Obs), mean, standard deviation (Std. Dev), minimum (Min), maximum (Max), skewness (Sk), and kurtosis (K) for each variable.

Descriptive statistics of Pakistan demonstrate certain dispersive tendencies along with specific statistical distributions. In this context, the variables of economic growth (lnEG), entrepreneurship (lnENT), financial intermediation (lnFI), and control variables except indices are log transformed to ensure uniformity of the scale and enhance clarity. The value of the mean for the economic growth variable (lnEG) is 26.051, while the standard deviation of 0.298 demonstrates a relatively stable pattern over the observed period. Entrepreneurship (lnENT) has a mean of 17.281 with low dispersion (SD = 0.180), suggesting steadiness in entrepreneurial activity. Financial intermediation (lnFI) also displays low variability, with a mean of 24.483 and a standard deviation of 0.232, which highlights a relatively steady financial system. Private investment (lnI) and public expenditure (lnPE) report means of 23.955 and 23.562 respectively, both showing moderate standard deviations (0.253 and 0.388), reflecting a balance in investment flows. Unemployment (lnUN), with a higher standard deviation of 1.046 and a positive skewness (0.658), shows some fluctuation but remains within a range from 12.229 to 15.021, suggesting cyclical labor market dynamics. The human development (HD) for Pakistan averages 0.497, with a very low SD of 0.041, underscoring gradual and consistent improvements in human development. Governance effectiveness (GE) and rule of law (RL) are both negative, at -0.602 and -0.801 respectively, with relatively low standard deviations (0.138 and 0.091), indicating persistent institutional challenges but also consistency over time. The skewness and kurtosis values across most variables are close to the normal range, reinforcing the normality of distributions and suitability for further econometric modeling. These indicators together provide a coherent statistical foundation for analyzing economic growth and development policies in Pakistan.

5.3. Unit Root Analysis

This study utilizes standard approaches to ascertain the data stationarity. These approaches include Dickey and Fuller's (1981) ADF test, Phillips and Perron's (1988) test, and Kwaatkowski et al.'s (1992) test. The estimates of all the approaches generate the similar outcomes; therefore, results of most frequently used ADF test are presented in Table 5.2. It is concluded that all variables are integrated of order 1 i.e. I(1), and the null hypothesis is rejected.

Table 5.2: Unit Root Test

Variables	Augmented Dickey Fuller Test Statistic Null Hypothesis: Variable has a unit root				Order of Integration
	At Level	Results	At 1st Difference	Results	
lnEG	-1.133	NS	-3.495**	S	I(1)
lnFI	-2.237	NS	-3.084**	S	I(1)
lnI	-0.502	NS	-4.989***	S	I(1)
lnPE	-0.539	NS	-3.374**	S	I(1)
lnHD	-1.261	NS	-4.949***	S	I(1)
lnENT	-1.464	NS	-4.304***	S	I(1)
lnUN	-0.197	NS	-4.737***	S	I(1)
GE	-1.677	NS	-3.439**	S	I(1)
RL	-1.555	NS	-5.125***	S	I(1)
Test Critical values (MacKinnon, 1996)					
1% Level	-3.593				
5% Level	-2.932				
10% Level	-2.604				

EG for economic growth, FI for financial intermediation, I for investment, PE for public expenditure, HD for human development, ENT for entrepreneurship, UN for unemployment, GE for government effectiveness and RL for rule of law. NS is used for non-stationary series and S is used for stationary series. All the variables converted into the natural log for estimation except GE and RL as they are indices

* implies that coefficient is significant at 10% level of probability

** implies that coefficient is significant at 5% level of probability and

*** implies that coefficient is significant at 1% level of probability

It is evident that employing the OLS is not suitable for estimation because this method requires variables' stationarity at the level. Moreover, in regression analysis, the inclusion of second-order integrated variables I(2) may also result in misleading outcomes. However, in our case, the variables are not integrated of higher order as well. Since integration order for all the variables is I(1), therefore cointegration tests may be applied. This study employs Auto Regressive Distributive Lag (ARDL) approach for cointegration to ascertain the association between the variables.

5.4. Effect of Financial Intermediation on Economic Growth

In order to examine the direct impact of financial intermediation on economic growth, this study estimates the first model according to the principles of structural equation modeling (SEM). SEM demands that this direct impact should be statistically significant. The study seeks to provide a thorough and dependable evaluation of how financial intermediation impacts growth of Pakistan's economy. Appropriate time series techniques are used to tackle any possible econometric problems, such as autocorrelation, heteroscedasticity, or non-stationarity etc.

5.4.1. Cointegration (Model-I)

This study estimates the first model to investigate the financial intermediation's cointegration with economic growth using (ARDL) bounds testing approach, as suggested by Pesaran et al. (2001). This approach is widely acknowledged as an appropriate tool for examining cointegration, which pertains to the presence of a long-term relationship among the variables. The outcome of this approach is displayed in Table 5.3. This test compares the value of F-statistic with the critical value of the upper bound. In this analysis the F-stats is 7.77 that exceeds the critical value of the upper bound and rejects the null hypothesis. Hence, cointegration is established between financial intermediation and growth of Pakistan's economy.

Table 5.3: ARDL Bounds Test (Model-I)

Dependent Variable Test Statistic	EG Value	Significance	Lower Bounds	Upper Bound
F-statistic	7.77***	10%	2.2	3.09
		5%	2.56	3.49
		1%	3.29	4.37

*, ** and *** implies significance at 10%, 5% and 1% level of probability

Table 5.3 reports the results of ARDL bounds testing to determine the cointegration between financial intermediation and economic growth.

5.4.2. Long and Short Run Analysis of Model-I

After confirming the cointegration, the study estimates the long and short run elasticities for the specified model. The instantaneous response of economic growth to changes in its drivers is recorded by the elasticities of short run, whereas long run elasticities monitor the relationship over an extended period of time and captures the equilibrium state. The results of these estimations are presented in the Table 5.4.

Table 5.4. Long & Short Run Elasticities of Model-I

Dependent Variable = $lnEG_t$

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long Run Results				
lnFI	0.053**	0.025	2.176	0.045
lnI	0.169***	0.057	2.963	0.009
lnPE	0.031	0.030	1.009	0.327
HD	1.808***	0.436	4.149	0.001
C	0.119	1.254	0.095	0.926
Short Run Results				
Δ lnEG$_{t-1}$	0.121	0.126	0.964	0.363
Δ lnFI	0.065***	0.012	5.280	0.001
Δ lnFI $_{t-1}$	0.025*	0.013	1.843	0.105
Δ lnI	0.027	0.022	1.225	0.255
Δ lnI $_{t-1}$	0.134***	0.023	5.737	0.000
Δ lnPE	-0.024*	0.013	-1.873	0.098
Δ lnPE $_{t-1}$	-0.001	0.013	-0.083	0.936
Δ HD	2.575***	0.445	5.777	0.000
Δ HD $_{t-1}$	2.374***	0.424	5.593	0.001
ECT $_{t-1}$	-0.621***	0.069	-8.964	0.000

***, ** and * denote significance at 1%, 5% and 10% level respectively

Diagnostic Tests			
R^2	0.749	Akaike info criterion	-6.153
Adj-R^2	0.725	Schwarz criterion	-6.006
Durbin-Watson	1.994	Hannan-Quinn criterion	-6.115
Serial Correlation LM Test:			
F-statistic	1.019	Prob. F(2,10)	0.395
Obs*R-squared	3.894	Prob. Chi-Square	0.142
Normality Test:			
Jarque Bera	0.223	Probability	0.894
Ramsey RESET Test:			
t-stats	1.417	Probability	0.184
f-stats	2.010	Probability	0.184

Table 5.4 reports both long-run and short-run estimation results obtained using the Autoregressive Distributed Lag (ARDL) model. Economic growth (EG) is the dependent variable, with financial intermediation (FI) as the main explanatory variable. Private investment (I), public expenditure (PE), and human development (HD) are included as control variables. Significance levels are indicated by ***, **, and * representing 1%, 5%, and 10% respectively. The lower panel presents diagnostic test outcomes assessing serial correlation, normality, and the adequacy of the model's functional form.

The results clearly demonstrate a positive financial intermediation's impact on growth of Pakistan's economy at 5% significance level (p-value 0.045) which aligns with the findings of Naveed and Mahmood (2019), Tariq et al. (2020), Saleem et al. (2021), and numerous other studies in the current body of literature. Financial intermediaries promote savings by providing a range of financial products, which are then used for investment, thereby boosting economic growth. The availability of credit both at the business and individual levels explains the impact deeply. Financial institutions facilitate the transfer of

funds between savers and borrowers, enabling investment by both individuals and businesses. This creates new employment opportunities and expands the economy as a whole. The evolution of the banking industry and the primary functions of banks provide assurance about efficient financial intermediation that helps conserve capital and encourage investment. Moreover, the ongoing improvement of the banking and related services has directly led to an increase in savings, investments, and economic growth. Pakistan is marking the increase of the sophistication of its financial markets with profound depth for the past twenty years. Economic reforms together with liberalization policies have strengthened the financial sector which has improved the efficiency of intermediation by digital and mobile banking technologies (Liu et al., 2024). These actions have accelerated the financial intermediation, promoting economic growth. In addition, the banking sector of Pakistan has played a crucial role in enhancing the positive impacts of financial intermediation on economic growth. The deep penetration of bank branches in urban and rural areas has improved financial inclusion for broader sections of the population. The financial banking infrastructure available has improved the distribution of resources through lending and credit facilities to numerous businesses and households. The increased availability of finance has also allowed small enterprises to expand and innovate which contribute more to the economy. In addition, a wider bank network reduces transaction costs and increases the efficiency of operations to perform financial activities. Access to financial services allow consumers and enterprises to undertake economic activities more efficiently and within a shorter period of time, thus increasing productivity (Afzal et al., 2021; Ishfaq et al., 2024).

Although the financial sector in Pakistan has made beneficial contributions to economic progress, it is hindered by various problems that prohibit it from completely supporting and sustaining economic development. Consequently, the economic growth of Pakistan is not sustainable. Although there has been advancement in the financial industry, a substantial proportion of Pakistan's population still lacks access to banking services or has limited access to them. The lack of widespread availability of financial services, particularly in rural regions, hampers economic activities and constrains growth (Adil & Jalil, 2020). As per the latest statistics from the website of the central bank (SBP, 2023), the population of Pakistan exceeds 240 million individuals. However, given that just 2.4% of the population has access to financial sources, the degree of engagement in the financial sector is relatively low and almost 53% of adults do not have access to adequate

financial resources in Pakistan. A significant factor contributing to the high number of unbanked individuals is the limited knowledge and understanding of financial products and how to use them. A significant segment of the population also lacks fundamental money and financial literacy. They are unfamiliar with the principles of budgeting, investing, and saving. Moreover, the informal sector accounts for a significant share of Pakistan's economic activity, which is dependent on informal financial services. It is crucial to incorporate these operations within the official financial system in order to improve financial intermediation and promote economic growth (Hayat & Rashid, 2020). On the other hand, credit allocation effectiveness in Pakistan is frequently undermined by preferential lending practices, government borrowing crowding out private sector credit, and restricted access for small enterprises. Enhancing the efficiency of credit allocation is essential for achieving sustainable growth (Zaheer et al., 2017). Moreover, the banking industry in Pakistan has conventionally been controlled by a handful of major banks, resulting in restricted competition and innovation. Moreover, the banking sector's capacity to lend efficiently has been compromised by elevated levels of non-performing loans (NPLs) (Ansari et al., 2023). Though, Pakistan's Islamic financial sector has developed significantly during the past few years, however, it still has obstacles in terms of integrating with the conventional financial system and growing its market presence. Strengthening the influence of Islamic finance has the potential to promote wider financial access and ensure economic stability (Zafar & Sulaiman, 2020). While the financial regulatory and supervisory structure in Pakistan has made progress, it still has difficulties in terms of enforcement and coverage. Inadequate regulatory supervision can result in financial instability and erode investor trust (Husain, 2011). Pakistan's capital markets are relatively less developed in comparison to other growing economies. The stock and bond markets suffer from a lack of depth and liquidity, which hampers enterprises' access to long-term financing choices (Mehmood & Fraz, 2022). Hence, it is imperative to undertake measures such as enhancing financial inclusion, improving regulatory frameworks, ensuring the growth of capital markets, integrating Islamic finance, and boosting the efficiency of credit allocation in order to strengthen the financial sector's contribution to economic development. To tackle these issues, it is necessary to implement a well-coordinated approach involving policy measures, regulatory changes, and financial infrastructure investments that promote long-term economic growth.

Investment apparently sways positively on growth of Pakistan's economy at 1% significance (p-value 0.009). This is due to the fact that increase in investment helps to expand the productive capability which ultimately elevates the output and contributes positively towards economic growth (Trpeski & Cvetanoska, 2019 ; Kong et al, 2020). The resultant outcome of investment is increase in employment opportunities, enhanced infrastructure and path towards industrialization which helps to warrant ample growth in the economy. Moreover investment generates a crowding-in effect by attracting additional investment and financing nationally as well as from abroad. This helps to induce investment in latest machinery and equipment, updated technology and infrastructure i.e. transportation and communication system, energy efficiency etc., which further aides to improve production process, lowering cost of production and improvement in the quality of goods and services. Thus a multiplier effect is stimulated and contributes towards a progressive spillover influence on economic growth.

Public spending has a positive but statistically negligible effect on economic growth. This finding aligns with the studies conducted for developing countries (Bose et al., 2007), and underdeveloped counties of Sub-Saharan Africa (Yasin, M., 2011). This limited impact seems to be obvious because of certain leakages in the economy, inefficient use and allocation of funds. Weak governance, corruption and mismanagement are some of the additional factors that fade the efficacy of public expenditure on growth of Pakistan's economy. Moreover, it has been a persistent problem and reported frequently that major portion of public expenditure is consumed for unproductive purposes e.g. for repayment of debt and debt servicing etc. then for those expenditures which are non-essential in nature. Public spending on luxury items and excessive perks for public servants and politicians, undue expenditure on events of extravagant nature, investments in politically motivated infrastructure projects with low economic viability and not based on economic rationale, unnecessary and non-productive subsidies to meet political objectives are some of the prominent factors which are actually futile and liable for wastage of resources.

The significance level of Human development is 1% with positive coefficient having a p-value 0.001. Hence found to be very influential towards economic growth and matches the work of (Fatah et al., 2012; Grubaugh, 2015; Taqi et al., 2021). It is apparent that enhancement in education, health and elevated per capita income helps to increase the productivity and expansion in economy. More educated, skilled and healthy workforce

exhibits efficiency and prove to be more productive and innovative, finds to be involved in more research and development, which ultimately translates into technological advancement and paves the way towards sustainability and economic prosperity.

The short run results depict a negative and statistically significant coefficient of the error correction term (ECT) and its value -0.621 which is less than one and shows the speed to rectify any variable departures from the long-term equilibrium path. It propounds that in case of any fluctuation or shock in the short span the variables will adjust quickly towards path of long run equilibrium. It is quite obvious from the results that statistically significant financial intermediation and human development stimulates positively in the short run as well, whereas public expenditure in the short-run negatively influences the economic expansion whereas in the long run it turns out to be irrelevant. As for as investment is concerned, it's lagged effect on economic growth is substantial as it takes time to translate investment in economic growth and therefore strongly influenced by its own lag as well.

To ascertain whether the model is accurate and estimated parameters are reliable, the study utilizes the Ramsey's RESET (Regression Equation Specification Error Test) test to confirm that the model's functional form is accurate. Model misspecification appears not to be significantly evidenced, according to the p-value of 0.184. This indicates that the model is accurately defined, and there are no missing variables or improper functional forms that could impact the model's validity. A p-value of 0.142 indicates that there is no significant evidence of autocorrelation in the residuals according to the LM Breusch-Godfrey test for autocorrelation. The model is deemed to be free from autocorrelation problems. The residuals appear to have a normal distribution based on the p-value of 0.894 obtained from the Jarque-Bera test for normality. The F-statistics and Prob χ^2 values offered strong evidence for the model's homoscedasticity, data normality, absence of autocorrelation, and accurate functional form. Therefore, the diagnostic test indicates that the model aligns with the key assumptions of ordinary least squares (OLS).

Furthermore, the CUSUM test and the CUSUM of squares test are used to evaluate the model's stability. as per recommendation of Pesaran et al. (2001) which is represented in Fig 5.1.

CUSUM Test **CUSUM of Squares Test**

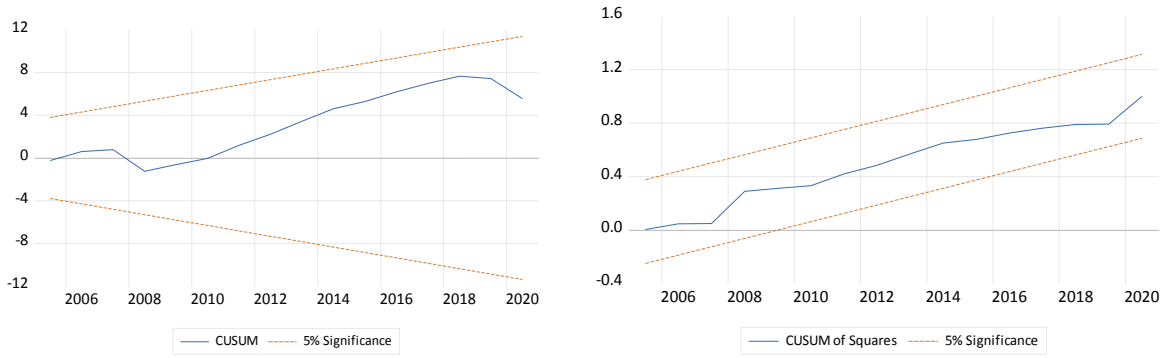

Figure 5.1

It is obvious that the plot of cumulative sum of recursive residuals i.e. blue lines fall within the 5% critical lines i.e. red lines. This proves that the residual variances, the estimated model and the model parameters are stable over time. Therefore, it is certain that the model is valid and accurate for forecasting and interpretation.

5.5. Effect of Financial Intermediation on Entrepreneurship

This section estimates the second model in accordance with the principles SEM to investigate the financial intermediation's direct impact on entrepreneurship. According to SEM, this influence should also be statistically significant. Appropriate time series approaches are utilized in order to address any potential econometric issues, such as autocorrelation, heteroscedasticity, or non-stationarity, amongst others, to ensure that the results are accurate and reliable. Using structural equation modeling (SEM) along with rigorous time series analysis, the section gives a comprehensive evaluation of the impact that financial intermediation has on entrepreneurial.

5.5.1. Cointegration (Model-II)

Just like first model, the (ARDL) bounds testing approach by Pesaran et al. (2001) is again applied here to analyze the long-term relationship between entrepreneurship and financial intermediation using the second model. The result of this method is shown in Table 5.5. The F-statistic value and the upper bound's critical value are compared in this test. The estimated F-statistic is 5.381, which is higher than the upper bound's critical value and disproves the null hypothesis. Thus a long-term cointegrating relationship

between financial intermediation and entrepreneurship is confirmed by rejecting the null hypothesis.

Table 5.5: ARDL Bounds Test (Model-II)

Dependent Variable	ENT	Significance	Lower Bounds	Upper Bound
Test Statistic	Value			
F-statistic	5.381***	10%	2.2	3.09
		5%	2.56	3.49
		1%	3.29	4.37

*, ** and *** implies significance at 10%, 5% and 1% level of probability

Table 5.3 reports the results of ARDL bounds testing to determine the cointegration between financial intermediation and economic growth.

5.5.2. Long and Short Run Analysis of Model-II

After confirming the cointegration between entrepreneurship and its determinants in model-2, The analysis moves on to calculate the model's long and short run elasticities. The long-run elasticity measures the relationship between entrepreneurship and its contributing factors over a long period of time, whereas the short-run elasticity measures the quick response of entrepreneurship to changes in its factors. Table 5.6 displays the findings of these estimations, which show how much entrepreneurship is impacted by its drivers over the long and short terms.

Table 5.6: Long & Short Run Elasticities of Model-II

Dependent Variable =$lnENT_t$				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Long Run Results				
LnFI	0.278***	0.075	3.707	0.003
LnUN	0.064**	0.021	2.985	0.012
GE	-0.655***	0.132	-4.961	0.000
RL	-0.349	0.312	-1.119	0.287
C	9.023	1.898	4.753	0.000
Short Run Results				
Δ LnFI	0.194***	0.039	4.945	0.000
Δ LnUN	-0.006	0.012	-0.551	0.592
Δ GE	0.054	0.052	1.050	0.316
Δ GE_{t-1}	-0.243***	0.070	-3.463	0.005
Δ RL	-0.296***	0.059	-4.943	0.000
Δ RL_{t-1}	0.130**	0.051	2.548	0.027
ECT_{t-1}	-0.314***	0.046	-6.853	0.000
***, ** and * denote significance at 1%, 5% and 10% level respectively				
Diagnostic Tests				
R^2	0.715	Akaike info criterion	-5.199	
Adj-R^2	0.608	Schwarz criterion	-4.854	
Durbin-Watson	2.045	Hannan-Quinn criterion	-5.113	
Serial Correlation LM Test:				
F-statistic	0.937	Prob. Chi-Square	0.137	
Obs*R-squared	3.966			
Normality Test:				
Jarque Bera	0.906	Probability	0.636	
Ramsey RESET Test:				
t-stats	0.311	Probability	0.762	
f-stats	0.097	Probability	0.762	

Table 5.6 reports both long-run and short-run estimation results obtained using the Autoregressive Distributed Lag (ARDL) model. Entrepreneurship (Ent) is the dependent variable, with financial intermediation (FI) as the main explanatory variable. Unemployment (UN), government effectiveness (GE), and rule of law (RL) are included as control variables. Significance levels are indicated by ***, **, and * representing 1%, 5%, and 10% respectively. The lower panel presents diagnostic test outcomes assessing serial correlation, normality, and the adequacy of the model's functional form.

Financial intermediation clearly has a positive and significant long-term influence (1% level of significance) on entrepreneurship in Pakistan. The financial intermediation's favorable impact on entrepreneurship in Pakistan is consistent with Schumpeterian entrepreneurship theory, which emphasizes the importance of access to financial resources in driving innovation and economic progress (Schumpeter, 1911). This substantial positive association between financial intermediation and entrepreneurship in Pakistan can be explained by the government's many initiatives and the expanding financial system. Financial intermediation is critical in mobilizing savings and distributing them to productive investments, which directly impacts entrepreneurship by

providing the necessary capital. To enhance financial intermediation, promote economic growth, and improve economic productivity these activities (operations) need to be integrated within the official financial framework (Hayat & Rashid, 2020). Moreover, in Pakistan, government-sponsored preferential lending, borrowing which crowds out credit to the private sector, and limited access for small businesses often distort the efficiency of credit allocation. Enhancing allocation efficiency is crucial to achieving a sustainable rate of growth (Zaheer et al., 2017). In addition, the Pakistani banking industry has historically been dominated by a few large banks, which stifles competition and innovation. High levels of non-performing loans (NPLs) have also impaired the banking sector's ability to lend efficiently. Furthermore, the severe non-performing loans (NPLs) economically burdensome within the banking sector have negatively impacted the banking sector's ability to extend credit optimally (Ansari et al., 2023). Nevertheless, the Islamic financial sector of Pakistan has experienced remarkable growth in the last few years, however, it faces challenges relating to the integration with the mainstream financial system and the need to expand its footprint in the market.Over the past few years, however, Pakistan has developed significantly in its Islamic financial sector, but, it still faces challenges in terms of integrating with the conventional financial system and expanding its market footprint. Increasing the Islamic finance penetration could improve access to finance and strengthen economic stability (Zafar & Sulaiman, 2020). Despite some progress made on the financial regulatory and supervisory framework in Pakistan, enforcement and scope remains a challenge. As noted by Husain (2011), insufficient oversight may lead to volatility in the financial market and loose investor confidence. When Pakistan is compared to other emerging economies, its capital markets seem to be more primitive especially a very limited bond market constrict long-term financing options for businesses (Mehmood & Fraz, 2022). Pakistani governments have been actively working to foster an entrepreneurial culture and develop the financial sector. In this regard, the State Bank of Pakistan's recent taken step is the setting up SME banking sections in commercial banks to enhance financing access for small scale industries and providing guarantee schemes for loans. These measures are aimed at reducing credit barriers and stimulating entrepreneurial activity by easing the finance acquisition process for entrepreneurs (Ahmad & Hamid, 2011). They have also exacerbated entrepreneurial activities in Pakistan. These institutions serve the underserved population by providing financial services, including small loans, to underbanked micro-entrepreneurs. This has enabled many people, especially in rural areas, to initiate and grow their businesses. The

impact of microfinance on entrepreneurship, including its contributions toward economic growth and poverty alleviation, has been widely studied (Khandker, 2005). In addition, digital financial services have improved the ease of accessing financial services in Pakistan. The launch of mobile banking and other fintech services has improved the scope of financial inclusion. Easypaisa and JazzCash, like any other digital platform, have greatly simplified the process of carrying out financial transactions. They have also enabled quicker access to funds for business owners (Demirguc-Kunt et al., 2020). Empirical studies suggest that the financial intermediation has a positive impact on entrepreneurship. It has been proven that the availability of financial services greatly stimulates entrepreneurial activity by reducing liquidity constraints and enabling investment in new business opportunities. According to Beck et al. (2005), the financial system's infrastructure is important for deepening entrepreneurship and economic development. Ayyagari et al. (2011) also mention the financing gap, claiming that it is one of the fundamental factors influencing entrepreneurial activity in developing countries such as Pakistan.

Unemployment positively affects entrepreneurship at a 5% significance level. This paradox is elucidated through multiple factors, all of which are supported by literature. The theory of necessity entrepreneurship explains why unemployment positively correlates with entrepreneurship. People, unable to find employment, may resort to self-employment ventures to earn an income. This is referred to as "necessity-driven" entrepreneurship, contrasted with "opportunity-driven" entrepreneurship where individuals establish businesses to take advantage of an available opportunity (Reynolds et al. 2002). In countries where the unemployment rate is particularly high, necessity entrepreneurship is able to drive the creation of new businesses. Unemployment can act as a "push factor" to strongly motivate a person to start their own business. In times of scarce employment opportunities, the cost associated with starting a new business decreases due to the lack of available jobs. This ultimately leads to an increase in entrepreneurial activities in the population (Thurik et al., 2008). People tend to start their own businesses as a last resort due to absence of stable jobs. In countries such as Pakistan, the ever-growing unemployment drives people towards increasing their income levels through self-employment and entrepreneurship, which is a part of the broader informal sector. This shift could stem from the need to survive in the absence of employment opportunities (Maloney, 2004). Unutilized human resources are more likely

to start small businesses as a result of prevailing lack of opportunities due to lower competition and minimal investment. As a result of high unemployment, it is likely that the state will adopt policies aimed at fostering the informal sector entrepreneurship through programs designed solely to combat unemployment. In Pakistan, many initiatives have been taken such as The Prime Minister's Youth Business Loan Program and Kamyab Jawan Programme etc., all aimed at encouraging self-employment through business creation. These programs provide financial assistance, along with training and counseling programs (Ahmad & Hamid, 2010). It has been shown that entrepreneurship has a positive correlation with the level of unemployment. For instance, Audretsch et al. (2001) show that increasing rates of unemployment can give rise to self-employment, particularly in places with underdeveloped labor markets. In the same manner, Thurik et al. (2008) shows that unemployment tends to increase the level of entrepreneurial activity in economies where employment is scarce.

People's perception toward effectiveness of government is negative, given its adverse consequences on entrepreneurship at a 1% significance level. The less than encouraging impact of government effectiveness on entrepreneurship in Pakistan is partially expected. This is consistent with the findings of Friedman (2011) and Obaji and Olugu (2014), who showed that entrepreneurial activities are likely to be suppressed in the presence of poorly enforced rules and overregulation. Klapper et al. (2006) found that complicated entry regulations discourage the formation of new firms. Similarly, Djankov et al. (2002) showed that high corruption coupled with large informal economies usually harms entrepreneurship, which is associated with restrictive corruption. Pakisan's perception that there is high cost and risk of starting a business stems from entrepreneurs need to pay bribes or favors to government officials to obtain permits or access government services (Shleifer & Vishny, 1993). On the other hand, the government's interest in some areas could also limit the scope of private entrepreneurs. For example, government ownership of firms or subsidies to certain sectors can restrain private investments and reduce the motivation for new competitors (Schneider & Enste, 2000). Furthermore, the quality of government effectiveness concerning entrepreneurship in Pakistan is still developing and even if improvements are made, the lack of positive impact stems from a relentless focus on streamlining business operations and curtailing needless red tape (Schneider & Enste, 2000). Additionally, the burden of bureaucratic procedures and discriminating regulations serves as an obstacle to entrepreneurship. The complexity of regulatory framework

presents a challenge for entrepreneurs, resulting in delays, increased costs, and a lack of motivation to initiate new ventures. Djankov et al. (2002) have observed that this phenomenon occurs in a variety of developing countries when well-intentioned policies inadvertently produce administrative burdens. Consequently, the detrimental effect of government effectiveness in Pakistan contradicts with numerous studies that contend that generally it has a positive impact on entrepreneurship by establishing a stable environment and protecting property rights (For instance Acemoglu & Johnson, 2005; Rodriguez-Gulias et al., 2018; Ajide, 2022).

The rule of law also exhibits a negative but insignificant influence on entrepreneurship. This finding corroborates with some previous researches that also indicate insignificant impact of rule of law, particularly on entrepreneurship in developing nations. Klapper et al. (2007) assert that, while legal reforms are vital, they alone are insufficient to foster entrepreneurship. The success of these reforms is greatly influenced by complimentary issues such as judicial system efficiency and corruption levels. Acs and associates (2008) observed that the consequences of the rule of law on entrepreneurship differ profoundly from country to country and tend to be conditioned by the stage of economic development and the presence of favorable institutions. In contrast, Djankov et al. (2002) noted a strong positive correlation between the level of entrepreneurship and the enhancement of regulatory frameworks, particularly the rule of law. In their view, the provision of property rights and contract enforcement is mandatory for entrepreneurship success. Stel et al. (2007) showed that countries with stronger rule of law tend to have higher rates of entrepreneurial activity, thereby underscoring the importance of legal certainty and strong enforcement for fostering entrepreneurship. Therefore, these findings are also in direct contrast to the outcome of several other studies that demonstrate a positive relationship between the rule of law and entrepreneurship (e.g., Levie & Autio, 2011; Goltz et al., 2015; Salinas et al., 2019; Elert et al., 2019; and Agostino et al., 2020). The weak but negative impact of Rule of Law on entrepreneurship in Pakistan could be attributed to several factors. The World Governance Indicators (WGI) captures perception of the rule of law, which may not accurately depict the situation in Pakistan. There is a possibility of divergence between the perception and reality regarding enforcement of the rule of law (Voigt, 2013). In Pakistan's case, the formal laws and regulations are theoretically neutral or even positive for business. Corruption and bureaucratic inefficiency can create norms and practices that are not conducive to law abiding entrepreneurial activities (Acemoglu

& Johnson, 2005). A large part of the economy of Pakistan operates in the informal sector which is hardly regulated by law. Entrepreneurs in this industry rely on informal networks and personal relationships rather than formal legal frameworks, which reduces the perceived impact of the rule of law on entrepreneurship (La Porta & Shleifer, 2014). Political instability in Pakistan is another risk that could weaken the rule of law, making the business environment unstable. Frequent changes in government and policy lead to inconsistent application of laws, hindering entrepreneurial enterprises (Aisen & Veiga, 2013). Social norms and cultural attitudes towards entrepreneurship also play a role in societies like Pakistan, where entrepreneurship is not highly valued or there are significant entry barriers (such as inability to obtain financing or access to financial markets), improvements in the rule of law may not result in increased entrepreneurial activity.

The short-run results show a statistically significant error correction term (ECT) with a negative coefficient -0.314, which is also less than one. This value reflects the speed at which any adjustments to the variables can be made to bring them back to the long-term equilibrium path. It says that if there is a change or shock in the short run, the equilibrium will be quickly restored by the variables in the long run. The results demonstrate that statistically significant financial intermediation significantly promotes entrepreneurship in the short term as well. Conversely, unemployment in the short run is not statistically significant, which shows that people obviously try to get wage employment for a while and would rather prefer to be unemployed in the short term. But if they remain unemployed over a long time, they try to start their own businesses. Initially, the government effectiveness has insignificant effect on entrepreneurship. However, after a while, it exhibits a significant negative effect, which than lasts in the long run as already discussed. Entrepreneurs initially respond positively to improvements in government effectiveness, but this does not immediately boost entrepreneurship. The second lag shows a negative impact, indicating that strict regulations and increased scrutiny only reveal their negative effects after the initial optimism fades. This highlights the complexity of policy impacts and the need to consider both long and short run effects in economic analysis. Rule of law's varying impact on entrepreneurship in the short run in Pakistan can be interpreted through economic, institutional, and behavioral factors. The short-run negative impact of the Rule of Law index on entrepreneurship, followed by a

positive impact in the second lag, indicates an adjustment period where businesses adapt to new legal norms.

The Ramsey's RESET test is used in the study to check the correctness of the functional form of the model and to confirm the precision of the model and reliability of the predicted parameters, whole p-value 0.762 suggests that the model is well specified. This indicates that the model is accurately defined, and there are no missing variables or improper functional forms that could impact the model's validity. The p-value of 0.1737 obtained from the LM Breusch-Godfrey test for autocorrelation shows that there is no significant evidence of autocorrelation in the residuals. The model is deemed to be free from autocorrelation problems. The Jarque-Bera test for normality yields a p-value of 0.636, suggesting that the residuals follow a normal distribution. The F-statistics and Prob χ^2 values offered strong evidence for the model's homoscedasticity, data normality, absence of autocorrelation, and accurate functional form. Therefore, the diagnostic test indicates that the model aligns with the key assumptions of ordinary least squares (OLS).

Moreover, the CUSUM test and the CUSUM of squares test are used to evaluate the model's stability as per recommendation of Pesaran et al. (2001) which is represented in Fig 5.2.

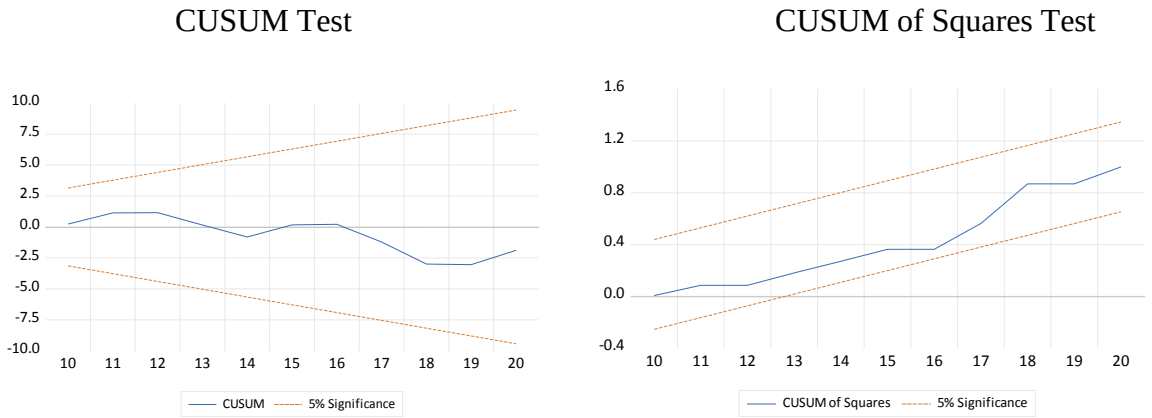

Figure 5.2

It is obvious that the plot of cumulative sum of recursive residuals i.e. blue lines fall within the 5% critical lines i.e. red lines. This proves that the residual variances, the estimated model and the model parameters are stable over time. Hence the reliability of the model and its validity for interpretation is ensured.

5.6. Effect of Financial Intermediation on Economic Growth and Entrepreneurship with Additional Variables Using GMM.

In the previous section, for the time series analysis specific to Pakistan, the study employed the Autoregressive Distributed Lag (ARDL) approach based on the stationarity properties and variables' order of integration which is an efficient tool for estimating both the short-run adjustments and long-run equilibrium relationships. The analysis incorporated all essential diagnostic tests to ensure the robustness and reliability of the time series results, including checks for serial correlation, heteroscedasticity, model stability, and functional form.

Despite the strengths of the ARDL approach, the study also acknowledges the potential issue of endogeneity, which may arise when explanatory variables correlate with the error term. Specifically, financial intermediation is endogenous in both the entrepreneurship model and the economic growth model; there may also be a problem of endogeneity when control variables are included. To deal with this issue and enhance the dependability of the findings, the study applies System Generalized Method of Moments (System GMM) as one of the additional techniques of estimation.

5.6.1. Generalized Method of Moments (Two Step System GMM)

System GMM is known to be effective in dealing with dynamic panel data and time series applications where there may be endogeneity, measurement errors, and auto correlated error terms (Arellano & Bover, 1995). It mitigates simultaneity bias and achieves more consistent parameter estimation by utilizing lagged levels and differences of endogenous variables as instruments (Blundell & Bond, 1998; Bond et al., 2001). The study's use of System GMM in conjunction with ARDL demonstrates that the econometric framework systematically addresses concerns regarding endogeneity, which enhances the overall strength and trustworthiness of the empirical findings. Besides that, the analysis has included other control variables to capture more broad macroeconomic and institutional determinants of economic growth and entrepreneurship. These include inflation, for which the Consumer Price Index (CPI) is used as a proxy to reflect the general price level and cost of living fluctuations; Democratic regime, represented by a dummy variable to distinguish between democratic and non-democratic governance structures over the

period 1996 to 2020, where a value of ‘1’ is assigned during democratic regimes and ‘0’ during non-democratic period (1999 to 2008); and infrastructure development, proxied by Gross Fixed Capital Formation (GFCF), which serves as an indicator of infrastructure development and investment in physical assets such as transportation, utilities, and communication systems that are essential for supporting entrepreneurial activity and financial sector expansion.

The rationale behind including these variables is to assess whether macroeconomic stability (as indicated by inflation), political environment (as captured by the democratic regime dummy), and infrastructural development (as reflected by GFCF) exert any significant influence on the relationship between financial intermediation, entrepreneurship, and economic growth. However, the empirical findings reveal that the inclusion of inflation and democratic regime do not lead to any substantial alteration in the results. The outcomes derived from the System Generalized Method of Moments (System GMM) estimation are found to be broadly in line with those obtained through the Autoregressive Distributed Lag (ARDL) approach and the estimated coefficients and model dynamics remain consistent. This consistency across estimation techniques further reinforces the robustness and credibility of the findings.

The output of the System GMM analysis, which accounts for potential endogeneity and dynamic interactions among variables, is summarized in the following table.

Table 5.7: Effect of Financial Intermediation on Entrepreneurship and Economic Growth

Generalized Method of Moments (Two Step System GMM)			
Model-I		**Model-II**	
Variables	**lnEG**	Variables	**lnEnt**
lnFI	.123**	lnFI	.219***
	(.047)		(.069)
lnGFCF	.102***	lnUN	.078***
	(.033)		(.019)
lnPE	.176	GE	-.471**
	(.166)		(.208)
HD	4.812***	RL	-.006
	(1.049)		(.225)
Inf	-.005***	DR	.023
	(.001)		(.078)
Cons	14.071***	Cons	10.589***
	(3.285)		(1.834)
Observations	24	Observations	23
Hansen J-Test	.256	Hansen J-Test	.582
AR(1)	.031	AR(1)	.027
AR(2)	.743	AR(2)	.431
Wald Test	.008	Wald Test	.013

*Standard errors are in parentheses, *** p<.01, ** p<.05, * p<.1*

Table 5.7 presents the estimated results of system GMM for two models. In Model-I, Economic Growth (lnEG) is the dependent variable, with Financial Intermediation (lnFI) as the explanatory variable, while Gross Fixed Capital Formation (GFCF), Public Expenditure (PE), Human Development (HD), and Inflation (Inf) are included as control variables. In Model-II, Entrepreneurship (lnEnt) is the dependent variable, with Financial Intermediation (lnFI) as the explanatory variable, and Unemployment (lnUN), Government Effectiveness (GE), Rule of Law (RL), and Democratic Regime (DR) as control variables. The lower panel of the table reports diagnostic statistics including tests for instrument validity and serial correlation.

Table 5.7 presents the results derived from the system Generalized Method of Moments (GMM) estimation technique for both the economic growth and entrepreneurship models, and these findings are consistent with those previously obtained using ARDL. This alignment in outcomes between two different estimation techniques strengthens the credibility and robustness of the study's empirical results and confirms that the relationships identified in the ARDL estimations are not spurious or sensitive to specific estimation techniques. Therefore, the application of system GMM serves not only to verify these earlier results but also acts as a methodological robustness check, enhancing the empirical rigor of the study. The slight difference between the ARDL and GMM estimations is addition of control variables in the system GMM framework i.e. inflation and the democratic regime.

In the first model, where economic growth is the dependent variable, inflation is introduced as an additional control variable to reflect the influence of macroeconomic stability on long-term growth performance. The results show that inflation has a

statistically significant negative impact on economic growth in Pakistan, with a coefficient of -0.005. Although statistically significant, the small magnitude of this coefficient suggests that while inflation acts as a constraint on growth by potentially eroding purchasing power and increasing uncertainty in investment planning, its long-run quantitative effect on Pakistan's economic growth is negligible. This relatively mild influence may be attributed to Pakistan's historically moderate inflation rates during the time frame used in the analysis, which, though occasionally volatile, have not consistently reached levels severe enough to severely disrupt long-term investment and production. Moreover, in the context of Pakistan, other structural constraints such as energy shortages, governance issues, and limited access to credit may have a more pronounced impact than price-level instability, which could explain the smaller size of the inflation coefficient.

Conversely, Gross Fixed Capital Formation (GFCF), representing private investment and infrastructure development, shows a strong and statistically significant positive relationship with economic growth. This finding underscores the vital role of capital formation in the developmental path of Pakistan. Investment in physical infrastructure such as roads, energy, and industrial capacity enhances productivity, but more importantly, fosters the growth of private sector activity. Pakistan, facing enduring infrastructure gaps, stands to benefit greatly from GFCF, which highlights the need to increase investment in public and private capital assets to improve economic activity.

Consistent with the results of previous ARDL estimations, financial intermediation continues to exert a significant and positive impact on economic growth. This relationship suggests that the expansion of financial services through increased credit availability, banking access, and efficient capital allocation supports entrepreneurship and firm expansion, thereby contributing to GDP growth. Finally, human development, as captured by an index reflecting improvements in education and health, remains a robust determinant of economic performance. Its positive and significant impact highlights the importance of investing in human capital to foster innovation, improve labor productivity, and ensure inclusive and sustained growth in the long run. Taken together, these findings affirm that while inflation control is important for macroeconomic stability, it is sustained investment in infrastructure, human development, and financial system deepening that plays a more transformative role in driving Pakistan's economic growth.

The diagnostic statistics further support the validity of the model. The Hansen J-statistic, with a p-value of 0.256, suggests that the instruments used in the model are valid and not correlated with the error term, satisfying the over-identification restriction. The Arellano-Bond test for first-order autocorrelation (AR(1)) shows a p-value of 0.031, indicating some correlation in the differenced residuals, which is expected. However, the absence of second-order autocorrelation (AR(2) p-value = 0.743) confirms that the model does not suffer from misspecification in terms of instrument lag structure. The Wald test (p-value = 0.008) confirms the joint significance of the explanatory variables, lending statistical credibility to the overall model.

In the second model, where entrepreneurship is the dependent variable, the system GMM estimation provides results consistent with those derived from the ARDL approach, thereby reinforcing the robustness of the empirical findings. One of the additional control variables included in this model is the democratic regime, represented as a dummy variable capturing periods of democratic rule in Pakistan between 1996 and 2020. The variable was designed to reflect the political context and its potential influence on entrepreneurial dynamics, particularly under the assumption that democratic governance by encouraging transparency, participation, and accountability may promote an environment conducive to entrepreneurial activity. The coefficient on the democratic regime variable is positive but statistically insignificant, indicating that while the presence of a democratic regime may correlate with a more open and participatory political environment, it does not, in and of itself, exert a strong or direct influence on entrepreneurial activity in Pakistan.

This outcome can be interpreted in the context of Pakistan's democratic evolution. While Pakistan has gone through several democratic transitions within the study duration, most of these democratic periods have been marked by weak governance, erratic decision making, bureaucratic inefficiencies, and a failure to implement meaningful reforms aimed at stimulating entrepreneurship. It has not always resulted in economic governance or market liberalization that is favorable for entrepreneurship in Pakistan. For instance, in the democratic phase after 2008, while there was noticeable progress towards democratic consolidation, the entrepreneurial ecosystem was still plagued by weak enforcement of property rights, high regulatory burdens, poor access to finance, SME government

support that was often contradictory, and sporadic cross-border trade finance solutions. This highlights the fact that the mere presence of democracy is insufficient to drive entrepreneurial efforts; in addition to democracy, there must be complementary reforms in governance, judicial effectiveness, infrastructure, and financial systems. Policies tailored to boost infrastructure access, streamlined business registration frameworks, and a robust entrepreneurial framework is critical in shifting the Pakistan's socio-economic landscape. Moreover, the lack of significance given to the democratic regime variable could indicate deeper cultural and structural Pakistan entrepreneurship constraints such as the prevalence of more secure employment occupations, low workforce participation by women, and low systems for innovation. With targeted policies, such as lowering barriers to entry for new ventures and bolstering the comprehensive entrepreneurial ecosystem, the potentially supportive impacts of democracy could materialize. While the democratic regimes in Pakistan could foster an atmosphere of increased civil freedoms and weave in formal systems of accountability within governance structures, their entrepreneurship effects are rather restricted without profound institutional shifts, economic deregulation, and specific measures to foster entrepreneurship. The results, therefore, highlight the importance of going beyond merely political democracy. The entrepreneurial prospects of Pakistan are principally contingent on the democracy of its governance institutions, regulatory policies, and the alignment of investment strategies and economic policies.

The results reaffirm the findings of ARDL that financial intermediation significantly and positively influence entrepreneurship in Pakistan, underscoring the importance of credit accessibility, venture capital, and financial inclusion in supporting entrepreneurial ventures. Similarly, unemployment positively impacts entrepreneurship, aligning with the "necessity entrepreneurship" hypothesis, where individuals engage in entrepreneurial activities due to lack of formal employment opportunities. The model finds that government effectiveness has a significant negative effect on entrepreneurship which could be attributed to structural inefficiencies, bureaucratic hurdles, or public doubt towards formal institutions. The negative coefficient for rule of law similarly reflects the challenges that entrepreneurs face in weak governed environments where property rights enforcement, contract resolution, and regulatory transparency are compromised. The diagnostic tests support the reliability of this second model as well: the Hansen test (p-value = 0.582) confirms instrument validity, AR(1) (p-value = 0.027) suggests expected first-order autocorrelation, while AR(2) (p-value = 0.431) indicates no problematic

second-order serial correlation. The Wald test's p-value (0.013) again affirms that the explanatory variables are jointly significant.

The use of system GMM not only reinforces the findings of the ARDL model but also strengthens the empirical accuracy of the study by accounting for endogeneity and dynamic interactions. The inclusion of additional variables does not significantly alter the core findings, which remain stable and consistent, thereby further affirming the robustness of the model's explanatory power. This similarity between the results of ARDL and system GMM certifies the validity of the study's theoretical framework and justifies the reliability of its policy implications.

5.7. Mediating Role of Entrepreneurship between Financial Intermediation and Economic Growth

This section looks into how entrepreneurship mediates the association of financial intermediation with growth of the efficiency-driven economies. Moderated mediation approach, as described by Muller et al. (2005) is used to achieve the objectives. Structural equation modeling (SEM) is utilized to estimate all regression models simultaneously, allowing for an in-depth understanding of the interrelationships among these variables (Awang, 2014).

5.7.1. Structural Equation Modeling (SEM)

Table 5.8 displays the outcomes of structural equation modeling.

Table 5.8: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	0.179***	0.063	2.86	0.004
lnFI	0.062**	0.027	2.24	0.025
lnPE	0.062***	0.023	2.77	0.006
lnI	0.271***	0.056	4.85	0.000
Cons	-5.484	0.458	-11.98	0.000
lnENT ←				
lnFI	0.272***	0.047	5.78	0.000
lnUN	0.114***	0.012	9.07	0.000
GE	-0.339***	0.078	-4.33	0.000
RL	-0.396***	0.124	-3.19	0.001
Cons	8.585	1.080	7.95	0.000

LR test of model vs. saturated: chi2(7) = 26.89, Prob > chi2 = 0.0001

Table 5.8 presents the estimation results from Structural Equation Modeling (SEM) when Entrepreneurship (Ent) is included as a mediator. The regression models are estimated simultaneously and the associations among variables are examined at the same time. The p-values indicate the significance levels of the estimated relationships.

The findings of the structural equation modeling (SEM) demonstrate that financial intermediation's influence on growth of Pakistan's economy is positive at 5% significance level. The value of coefficient is 0.062, which is representing magnitude of this direct impact. Simultaneously, financial intermediation also sways positively on entrepreneurship at 1% significance level (p-value 0.000). The coefficient 0.272 represents the size of this effect. These results align with the findings of Kiani and Ali (2019). The prior discussion in the above sections has effectively explained these relationships. Financial intermediation promotes the effective distribution of resources by directing funds from those who save to individuals who borrow, hence encouraging investment and economic transactions. In Pakistan, where entrepreneurs use to face challenges in accessing financial resources, the implementation of efficient financial intermediation can significantly contribute to the development of new businesses. The findings clearly demonstrate that entrepreneurship's effect is positive on growth of Pakistan's economy which is significant at 1% (p-value 0.004) and the coefficient 0.179 represents this direct impact of entrepreneurship through the promotion of innovation, job creation, and increased competition. These findings are supported by Memon et al. (2019) and Kumar and Alwi (2023). Entrepreneurs stimulate economic growth by offering new

products and services, hence potentially enhancing productivity and efficiency within the economy. Acs et al. (2013) highlight the significance of entrepreneurship in driving economic growth, specifically in terms of its capacity to create jobs and foster technical progress. Entrepreneurs promote economic activity and generate better growth rates by establishing new markets and enhancing competition.

The overall findings of SEM align with the earlier findings of the autoregressive distributed lag (ARDL) analysis. The only observed difference in the results of SEM is acknowledged with respect to the significant role of the control variable public expenditure. While examining the financial intermediation's direct influence on growth of Pakistan's economy, it turns out that public expenditure has no meaningful effect. However, when entrepreneurship is included as a mediator in the model, the relevance of public expenditure shifts and exhibits a significant positive influence on growth of Pakistan's economy at 1% (p-value 0.006). This indicates that funding from public sources becomes more important when it comes to supporting entrepreneurial functions. These conclusions corroborate with Nica (2013). Construction projects, as well as investment in education and technology, can positively transform the entrepreneurial ecosystem. For instance, substantial spending on infrastructure improvements, like building motorways and roads or projects like CPEC, makes doing business cheaper. This also enables and encourages greater entrepreneurial market participation and competition. Because of the reduced corporate costs and risks, there would be subsidized investment and reduced financial burdens. Therefore, the role of financial intermediation on integrated economic growth may be reinforced by increasing active entrepreneurship (Guerrero et al., 2016). Business public spending on research, R&D grants, and innovation subsidies allows entrepreneurs to obtain relevant modern concepts and technologies. This creates the conditions which cultivates an environment that encourages creativity and, in turn, drives economic growth and development through entrepreneurial activities (Acs et al., 2013). Likewise, public spending on health and education, social services and other training programs can equip prospective entrepreneurs with the knowledge and skills necessary to devise new ideas and grow their business (Beck et al., 2004). Moreover effective spending of public money on improving the regulatory and institutional infrastructure can reduce the administrative burdens faced by entrepreneurs which makes it easier for businesses to start and operate successfully. This could, in turn, drive entrepreneurial activities and support positive economic development. Hence,

government initiatives aimed at promoting entrepreneurial endeavors can result in increased levels of innovation and economic growth (Acs et al., 2013).

5.7.2. Testing Mediation

The mediation analysis is conducted by employing a methodology originally proposed by Baron and Kenny (1986) and Kenny (2024). This methodology involves three fundamental procedures, as described in Chapter 3, which are necessary for showing mediation. The findings of the mediation analysis are presented in Table 5.9.

Table 5.9: Baron and Kenny approach & Sobel's Test

Estimates	Delta	Sobel
Indirect effect	0.049	0.049
Std. Err.	0.019	0.019
z-value	2.564	2.564
p-value	0.010	0.010
Conf. Interval	0.011 , 0.086	0.011 , 0.086

STEP 1: lnENT:lnFI (X → M) ; β=0.272 ; p=0.000
STEP 2: lnEG:lnENT(M → Y) ; β =0.179 ; p=0.004
STEP 3: lnEG:lnFI (X → Y) ; β =0.062 ; p=0.025
All the three steps and the Sobel's test are significant, therefore the ***mediation is partial****.*

Table 5.9 presents the indirect effect of financial intermediation (FI) on economic growth (EG) through the mediating role of entrepreneurship (Ent) by reporting the three steps of Baron and Kenny approach. The significance of this mediation is evaluated using Sobel's test, with p-values indicating statistical relevance.

It is evident from the result that financial intermediation's direct impact on economic growth is 0.062 represented by its coefficient. This effect is statistically significant at 5% which is an indication that there is an effect that has to be mediated. It is also apparent that the direct impact of financial intermediation on entrepreneurship is 0.272 represented by its coefficient, significant at 1% that offers proof of the connection between entrepreneurship and financial intermediation. The results further show that the coefficient 0.179, which is similarly statistically significant at 1%, represents the favorable impact of entrepreneurship on economic growth. Therefore, Economic growth and Entrepreneurship may be associated due to the confounding effect of financial intermediation, which influences both the variables. It is found that the influence or effect of financial intermediation diminishes after incorporating the entrepreneurship in the model because a portion of the effect has been transferred through the entrepreneurship. This means that in the first instance financial intermediation impacts the entrepreneurship and then entrepreneurship impacts the growth of Pakistan's economy, thus the financial intermediation's indirect effect on growth of Pakistan's economy through the channel of

entrepreneurship is 0.049 i.e. (0.062 x 0.179) which has been reduced and thus providing an evidence of partial mediation. As all the three steps of Barron and Kenny approach are significant and financial intermediation's effect of on Pakistan's economic growth has been reduced therefore entrepreneurship partially mediates the relationship of financial intermediation with growth of Pakistan's economy.

5.7.3. Validating Mediation through Sobel's Test

The statistical significance of the mediation effect is assessed using Sobel's (1987) z-test in order to validate the mediation's results. It is inferred from the Table 5.9 that the z-value calculated from Sobel's test is 2.564 which is greater than ± 1.96 and is also significant with p-value 0.01 so it is confirmed that the mediation is significant.

5.7.4. Validating Mediation through Zhao's Test

For further confirmation of the statistical significance of the mediation effect, an approach proposed by Zhao et al. (2010) is applied. Table 5.10 illustrates the results of this approach.

Table 5.10. Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	0.049	0.049
Std. Err.	0.019	0.019
z-value	2.564	2.601
p-value	0.010	0.009
Conf. Interval	0.011 , 0.086	0.014 , 0.087

STEP 1- lnEG:lnFI (X → Y) with β =0.062 and p=0.025

As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation (partial mediation)

Table 5.10 presents the mediating role of entrepreneurship(Ent) between financial intermediation(FI) and economic growth(EG) by reporting the steps of Zhao, Lynch & Chen's approach. The significance of this mediation is evaluated using Monte Carlo test, with p-values indicating statistical relevance.

It is apparent that the indirect effect is 0.049 which is positive and is in the same direction as of direct effect which is 0.062. Moreover, the Monte Carlo test is significant with p-value 0.009 and the confidence interval is not zero, therefore, it is determined that the mediation effect of entrepreneurship is statistically significant.

5.7.5. Effect Size of the Mediation

The ratio of indirect effect to total effect (RIT) is used to calculate the proportion of financial intermediation's effect on growth of Pakistan's economy that is mediated by entrepreneurship, and the ratio of indirect effect to direct effect (RID) is used to calculate the magnitude of this mediated effect. These calculations are used to determine the effect size of the mediation. Table 5.11 presents the outcomes of RIT and RID.

Table 5.11: Effect Size of the Mediation

Ratio of indirect effect to total effect		
RIT	=	(Indirect effect / Total effect) (0.049 / 0.110) = 0.441
Ratio of indirect effect to direct effect		
RID	=	(Indirect effect / Direct effect) (0.049 / 0.062) = 0.789

Table 5.11 reports the effect of mediation and its magnitude by calculating the ratio of indirect effect to total effect (RIT) and ratio of indirect effect to direct effect (RID)

The results clearly show that, while the value of RID is 0.789, which indicates that the mediated effect of entrepreneurship is approximately 0.8 times larger than the direct effect of financial intermediation on growth of Pakistan's economy, the value of RIT is 0.441, which indicates that entrepreneurship mediates about 44% of the effect of financial intermediation on growth.

The observed partial mediation implies that relying alone on financial intermediation is insufficient for maximizing economic growth; it must be supplemented with entrepreneurial activities. The concept of partial mediation is more logical and occurs only when all of the aforementioned procedures are met (Baron and Kenny, 1986). However, the RID value suggests that the influence of entrepreneurship as a mediator on the overall effect needs more improvements. The possible reason might be the entrepreneurial ecosystem in Pakistan, which is still in the process of development. Several features, such as the legal framework, access to markets, and entrepreneurial culture, may not yet be entirely helpful.

The government of Pakistan is actively working to foster entrepreneurship in the country, striving to promote self-employment. Over the last three decades, many effortful steps have been taken by the government to not only foster and enhance entrepreneurship but

also to create an entrepreneurial culture in Pakistan. One of such efforts is the Prime Minister's Youth Business Loan Scheme (PMYBL) which was launched in 2013, providing subsidized business loans to people in the age bracket of 21 to 45 years. The aim of the scheme is to support micro enterprises and stimulate self-employment opportunities. The loans are provided on concessional markup rates with a deferment period, therefore, aiding the young entrepreneurs in establishing or expanding their businesses (Gill et al., 2019). In 2019, the Kamyab Jawan Program was announced which is a self contained major project focusing on youth entrepreneurship and employment. The program encompasses multi-faceted projects among which is the Youth Entrepreneurship Scheme (YES) providing loan facilities to the young entrepreneurs on easy terms. Moreover, the program offers skills development courses aimed at enhancing the entrepreneurial skills of the youth (Javed, 2020).

In partnership with TiE Islamabad and the US Embassy, Pakistan Startup Cup focuses on the competition of business models to foster innovation and entrepreneurial eagerness. The initiative provides courses in mentorship, training, and networking for businesses to fine-tune their models and prepare for potential investors. Likewise, in collaboration with the Ministry of Information Technology and Higher Education Commission, the government of Pakistan has set up National Incubation Centers in Emerging Hub universities located in major cities through Ignite - National Technology Fund. These centers provide comprehensive incubation, mentorship, office space, as well as connections to investors and industry professionals. The goal is to foster an environment that facilitates the growth of technology-driven startups and agile businesses (Qureshi et al., 2021). The Small and Medium Enterprise Development Authority (SMEDA), established in 1998, actively supports entrepreneurship by providing comprehensive assistance and support services to small businesses. The Authority supports business development and offers educational activities as well as access to financial resources. SMEDA engages in policy advocacy aimed at fostering a conducive environment for small businesses (Mustafa et al, 2018). The health-focused Sehat Sahulat Program has, by reducing healthcare costs for entrepreneurs and their employees, indirectly promoted entrepreneurial activity. Small business owners are able to brace themselves with more resources in sustaining their business, which accelerates sustained, catalyzed growth (Khalid et al., 2021). Targeting poor households, the Kamyab Pakistan Program launched in 2021 aims to provide microcredits to stimulate entrepreneurship and deepen financial

inclusion. This includes providing zero-markup loans for small businesses, agricultural loans for farmers, and mortgage loans on low cost housing which all serve to build an inclusive entrepreneurial ecosystem (Hameed et al., 2023). These include the Women Entrepreneurship Development Program facilitated by SMEDA, as well as multiple initiatives under the Kamyab Jawan Program designed for women's empowerment. These programs provide women with training, mentorship, and grant funding to encourage the creation and growth of women-led businesses (Shahzad et al., 2012). The Digital Pakistan Initiative aims to build an all-encompassing ecosystem around the inclusivity of individuals and the cultivation of digital entrepreneurship. This project attempts to improve digital technology infrastructure, increase awareness and assist in the fostering of digital literacy amongst young people as well as aid technology firms. It plays a major role towards cultivating innovation and entrepreneurship in the digital economy (Arfeen & Saranti, 2021).

In conjunction with these policies, the government is now trying to create an entrepreneurial framework for Pakistan by furnishing entrepreneurs with funding, coaching, business training, and policy support. These policies aim to solve the multiple challenges that entrepreneurs face like inadequate funding, need to acquire new skills, and market entry challenges. Therefore these policies help in building a productive entrepreneurial landscape for the country. They serve these purposes essentially to reduce rampant unemployment, enhance economic activity, and drive innovative and technological development.

Although the government has implemented several initiatives to promote entrepreneurship, a comparison of the state of entrepreneurship in Pakistan with its population reveals that it is comparatively underdeveloped. Pakistan encounters multiple obstacles in cultivating a dynamic entrepreneurial ecosystem, despite its substantial and youthful population. The GEM Pakistan National Report 2019-20 reveals that Pakistan’s TEA rate is comparatively low in relation to other nations. This suggests a decline in entrepreneurial activity in Pakistan. The survey emphasizes that a mere 9.7% of adults in Pakistan are involved in early-stage entrepreneurial endeavors. This phenomenon might be attributed to a cultural inclination that favors to obtain a stable employment preferably in the public otherwise in the private sector, rather than taking on the risks and uncertainties associated with starting one’s own business. Individuals opt to do entrepreneurship only when they are unable to secure a suitable employment opportunity. Thus, a significant factor stimulating the interest in entrepreneurship is the high unemployment rate,

specifically among the younger population. This study also validates the positive relationship between unemployment and entrepreneurship, with strong significance of 1%. This finding indicates the presence of a cultural mindset that encourages entrepreneurial activity in the face of unemployment. As per the Pakistan Bureau of Statistics, the unemployment rate among those aged 15-29 is evidently greater than the overall national average. This has encouraged some young adults to consider entrepreneurship as a viable option and an alternate to wage employment. Afza and Rashid (2009) indicate that insufficient employment prospects in the formal sector motivates individuals to pursue entrepreneurial activities in order to secure their living and achieve economic stability. Thus, in Pakistan, a substantial proportion of entrepreneurial activities are motivated by necessity, mostly due to high levels of unemployment. Necessity-driven entrepreneurs are those who initiate business ventures as a result of limited employment prospects, while opportunity-driven entrepreneurs establish enterprises with the intention of capitalizing on a perceived market opportunity (Fairlie & Fossen, 2018).

In spite of the government's various initiatives to ease the financial burden, a considerable challenge that continues to exist is the lack of available financing that is critical for business cultivation and expansion. According to the World Bank's report, only 21% of people in Pakistan have access to formal financial services in 2020. This glaring gap severely suppresses the potential of entrepreneurs to access finance. In this study, the value of RID embodies the concept stated above. This is because of the lack of financial literacy as a whole in Pakistan, particularly concerning fostering an entrepreneurial spirit. Nabi et al. (2018) emphasized the pivotal impact of entrepreneurial education in enhancing entrepreneurial activities and equipping people with the necessary skills to start and manage businesses. The educational landscape of Pakistan has systematically neglected to integrate entrepreneurship into the school systems, failing to provide pathways for the youth to acquire skills to establish businesses. In addition, within Pakistan, there are considerable risks associated with the legal and regulatory framework for business entrepreneurs. In the Doing Business Report of 2020, the World Bank ranked Pakistan at 108 out of 190 economies. This shows that there is a lack of orderly function for the government services and regulations necessary to set up and run businesses in Pakistan. Some of the structural impediments (also referred to as "above-the-line" obstacles) include excessive costs associated with mandatory licenses and permits, insufficiently guaranteed property rights, sparse protection of intellectual assets, and inadequate enforcement of contracts. Such socio-economic conditions dampens innovative activities and the establishment of new ventures.

In spite of all these significant challenges, the cultural mindset is slowly shifting, especially within the younger demographic that is more willing to take on risks and explore new ventures. Financial independence appears to be the biggest motivator for them, alongside the perception that self-employment is more rewarding than traditional jobs. There is a considerable gap, however, between the actual circumstances and the optimism surrounding entrepreneurship that is viewed as an alternative to wage employment. Other than the socio-economic factors, such disparities may include the level of education and skills, availability of funds, stringent financing regulations, and underdeveloped infrastructure. More younger people now consider entrepreneurship as a career option in Pakistan (Hussain et al. (2019). The increase in perception is because of the influence of success stories and the startup culture boom. The GEM 2019-20 national report on Pakistan did not provide conclusive evidence about entrepreneurship in the country, yet it remained optimistic. The report also showed that although a number of people seem to understand the possible benefits of starting a business there exists a wide gap between understanding and action mainly due to entrepreneurial challenges and lack of proper skills. Close to fifty-five percent of the adult population in Pakistan hold to the perception that business opportunities exist in their residential region but insufficient skills alongside fear of failing shut the door on aspiring to becoming entrepreneurs.

The entrepreneurial ecosystem is still facing many challenges, however, efforts to improve it are being made in Pakistan. Plans of the government and its support programs are encouraging more people to take up entrepreneurship. For instance, the Kamyab Jawan Program along with business incubators and accelerators such as Plan9 and the National Incubation Centers are providing funds, training, and mentorship to aspiring entrepreneurs. These programs aim to foster a positive environment that not only boosts the appeal for self-employment but also encourages the growth of startups and small businesses. Improving the ecosystem for entrepreneurial activity would also improve the impact of financial intermediation on the growth of the economy of Pakistan. Some of the policies that can be considered are the lowering of barriers to finance, the simplifying of regulatory barriers, the sharpening of ancillary business support for emerging enterprises, the broadening of access to technology and markets, and the increasing of technological avenues.

5.8. Conclusion

This chapter examines the relationship between financial intermediation and the entrepreneurial activities and growth of Pakistan's economy between 1996 and 2020 using structural equation modeling (SEM). The study constructs three models to analyze these relationships. The first model focuses on assessing financial intermediation's impact on the growth of Pakistan's economy, whereas the second one focuses on assessing financial intermediation's impact on entrepreneurship. The third model assesses financial intermediation's indirect impact on the growth of Pakistan's economy through the entrepreneurship channel. In order to validate the robustness of SEM results, this study uses ARDL to assess the direct impact of financial intermediation on economic growth and entrepreneurship.

The results of the first model empirically confirm that financial intermediation positively supports the growth of Pakistan's economy, proving its importance for sustaining growth in the economy. The second model also shows that financial intermediation promotes entrepreneurship, demonstrating its importance for fostering an entrepreneurial environment. The results from SEM analysis confirm that entrepreneurship partially mediates the relationship of financial intermediation with the growth of Pakistan's economy. This indicates that the entrepreneurial ecosystem in Pakistan is in developing phase and the traditional mindset towards entrepreneurship is changing gradually, mainly caused by the high levels of unemployment among the youth. However, there are various barriers that hinder the rapid growth of entrepreneurship. The obstacles include a lack of financial literacy, which restricts the ability to obtain financing, inadequate entrepreneurship education, leading to a reduced number of innovative ideas and lower rates of success, weaknesses in the rule of law and flaws in government effectiveness, which discourage individuals from initiating business ventures.

This research outlines the steps taken by the Pakistani government to promote entrepreneurship as a strategy towards reducing unemployment and stimulating economic growth. Such steps include easy financing provisions and setting up of incubation centers, among others. However, these initiatives are not enough to create a complete entrepreneurial ecosystem. Pakistan may further promote entrepreneurship and maximize the beneficial influence of financial intermediation on economic expansion by improving

financial literacy and entrepreneurship education, expanding the financial system, and strengthening the rule of law and government effectiveness.

CHAPTER-6

CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

Financial intermediation, entrepreneurship, and economic growth has been a focal point of economic research, with financial intermediation acknowledged as a vital factor of economic growth by facilitating availability of finance and business activities. These activities, in turn, stimulate innovation, productivity, and overall economic activity, further reinforcing economic development. The significant positive relationship between financial intermediation and economic growth underscores the importance of financial systems in fostering sustainable development. However, many countries, including Pakistan, continue to experience weak economic growth and high unemployment, possibly due to an inadequate entrepreneurial ecosystem despite the availability of resources and demographic advantages.

The literature regarding influence of financial intermediation on economic growth and entrepreneurship is largely supportive, with a significant number of studies reporting positive effects, while a few suggest no or even negative relationships. There is not only a support for a positive influence of finance on entrepreneurship and economic growth, but research also demonstrates that entrepreneurship and economic growth are positively correlated. However, the interconnectedness of these three domains has not been thoroughly explored and the mediation impact of entrepreneurship between financial intermediation and economic growth is under-researched, leaving a gap in both theoretical and empirical understanding.

This study contributes to the literature by integrating these three domains and providing a theoretical and empirical examination. A theoretical model was developed to ascertain the mediation impact of entrepreneurship between financial intermediation and economic growth. Structural equation modeling (SEM) was utilized to estimate the effect of financial intermediation on economic growth through the channel of entrepreneurship. To validate the results of SEM, appropriate panel and time series techniques were used to

analyze the direct impacts to overcome any possible econometric issues. In panel analysis, the study employed Pooled OLS, Random Effects (RE), Fixed Effects (FE), and Generalized Method of Moments (GMM). However, the GMM results, which address potential econometric issues like endogeneity, were particularly relied upon for their robustness. For the time series analysis of Pakistan, the Auto-Regressive Distributed Lag (ARDL) model was employed due to its advantages in handling small sample sizes and capturing both long-term and short-term dynamics.

In the global panel analysis, it was found that financial intermediation has a significant positive impact on economic growth. Other control variables, such as private investment, public expenditure, and human development, also showed positive associations with growth. Financial intermediation also positively impacted entrepreneurship, though other factors like government effectiveness and the rule of law negatively influenced entrepreneurship, indicating public skepticism about these institutions. Unemployment was found to be positively associated with entrepreneurship, indicating that many individuals turn to entrepreneurship out of necessity when formal employment opportunities are lacking. Interestingly, the size of the unemployment coefficient in the global panel was the largest, suggesting that, on a broader scale, unemployment is a significant driver of entrepreneurial activity worldwide. Entrepreneurship was found to partially mediate the relationship between financial intermediation and economic growth, with 28% of the impact of financial intermediation on growth being mediated by entrepreneurship. The mediated effect was 0.4 times as large as the direct effect of financial intermediation on economic growth.

In innovation-driven economies, financial intermediation positively impacted both economic growth and entrepreneurship. Here, the rule of law positively influenced entrepreneurship, while government effectiveness had a negative impact. In innovation-driven economies, the size of the unemployment coefficient was the smallest. This suggests that entrepreneurship in these economies is less likely to be driven by necessity and more by opportunity, innovation, and the pursuit of economic advancement. The more developed financial systems and stronger institutional frameworks in these countries provide a conducive environment for opportunity-driven entrepreneurship, where individuals are less pressured to start businesses solely due to unemployment. Entrepreneurship partially mediated the relationship between financial intermediation and

economic growth, with 18% of the impact being mediated. However, when entrepreneurship was included as a mediator, the rule of law's coefficient turned negative, while government effectiveness became insignificant, suggesting complex institutional dynamics in these economies.

In efficiency-driven economies, financial intermediation again showed a positive impact on both economic growth and entrepreneurship. The findings from this analysis were very relevant considering the stages of economic development in these countries. The impact of government effectiveness was favorable for entrepreneurship but the rule of law had the opposite effect. In efficiency-driven economies, the magnitude of the unemployment coefficient was moderate suggesting a balanced state in which entrepreneurship is driven by both necessity and opportunity. These countries, which are in a transitional stage of development, may have some support frameworks available for entrepreneurs, but formal employment opportunities for the entire workforce remain limited. Entrepreneurship had a stronger mediating role in these economies, with 38% of financial intermediation's impact on economic growth being mediated, and the mediated effect being 0.6 times as large as the direct effect of financial intermediation on economic growth. This suggests that efficiency-driven economies benefit the most from entrepreneurial activities, given their stage of development.

In resource-driven economies, financial intermediation positively impacted economic growth, but human development was not a significant factor. Financial intermediation also positively influenced entrepreneurship, but both government effectiveness and the rule of law negatively impacted it. The size of the unemployment coefficient was largest in resource-driven countries, implying that in these economies, entrepreneurship is predominantly driven by necessity rather than opportunity. The weak financial systems, low government effectiveness, and poor rule of law in these countries likely force many individuals into entrepreneurship as a means of economic survival. Unlike the other groups, entrepreneurship had no mediation impact between financial intermediation and growth of resource-driven economies. The weak financial systems, lack of government effectiveness, and poor rule of law in these countries likely hinder entrepreneurial growth.

For the time series analysis of Pakistan, Financial intermediation had a significant positive impact on economic growth both in the long run and short run, with the error

correction term being negative, significant, and less than one, indicating a quick restoration of equilibrium in case of disequilibrium. Private investment and human development were also significantly positively associated with economic growth, whereas public expenditure was positive but insignificant. Financial intermediation positively impacted entrepreneurship in both the long run and short run, with the error correction term indicating quick adjustments to equilibrium. However, government effectiveness and the rule of law negatively impacted entrepreneurship. Unemployment was positively associated with entrepreneurship, suggesting that a significant portion of entrepreneurial activity in Pakistan is driven by necessity rather than opportunity. Entrepreneurship mediated 44% of the relationship between financial intermediation and economic growth in Pakistan, with the mediated effect being 0.8 times as large as the direct effect. Interestingly, when entrepreneurship was included as a mediator, the coefficient of public expenditure became significant and positive, likely reflecting the impact of government initiatives to promote entrepreneurship. However, challenges remain in developing a robust entrepreneurial ecosystem in Pakistan, as the ratio of indirect effect to direct effect is low and cultural preferences still lean towards wage employment over entrepreneurship.

This study finds that the relationship of financial intermediation with economic growth is generally mediated by entrepreneurship, particularly in efficiency-driven and innovation-driven economies. To maximize this effect, countries need to develop robust entrepreneurial ecosystems and strengthen their financial systems. Focus on improving the level of financial and entrepreneurial literacy, the effectiveness of the government, and the enforcement of the rule of law is recommended to ensure a more favorable environment for entrepreneurship in Pakistan and other comparable economies driven by resources.

The results highlight the importance of distinctly defined financial policies and institutional frameworks which incentivize financing entrepreneurship known to drive economic growth. Addressing these aspects would make it easier for policymakers to exploit the advantages of financial intermediation towards fostering sustainable development coupled with lower unemployment levels. This study contributes particularly to the understanding of the relation between financial intermediation,

entrepreneurship, and economic growth, and therefore it can be useful for scholars and practitioners in finance and economic development.

6.2. Policy Recommendations

In alignment with the empirical results of the study, the following policy proposals are tailored to the specific economic conditions, institutional structures, and levels of development of various groups of countries.

6.2.1. For Resource Driven Countries

After the empirical analysis and given the absence of an entrepreneurial mediation effect between financial intermediation and economic growth in resource-driven countries, Following policy suggestions are tailored for these economies:

(i) Governments should encourage growth in the non-extractive sectors by enhancing the legal and regulatory frameworks to limit overdependence on natural resources. Strengthening financial institutions while minimizing red tape will channel financial resources toward productive and entrepreneurial activities, thus supporting SDG 9 (Industry, Innovation, and Infrastructure).

(ii) Enhancing governance and improving the rule of law are prerequisites to achieving SDG 16 (Peace, Justice, and Strong Institutions) and establishing a dependable business climate. Reduced corruption and increased accountability will strengthen investor confidence and facilitate sustainable entrepreneurship in economies abundant in resources but constrained by weak institutions.

(iii) In regions with weak institutional structures and underdeveloped financial markets, there is a need to scale up banking for the underserved regions to align with SDG 8 (Decent Work and Economic Growth) and SDG 10 (Reduced Inequalities). Small scale enterprises and greater financial inclusion can be promoted through mobile banking and microfinance. Such reforms should be coupled with strong investments in governance, education, and infrastructure aimed at fostering a more stable environment for entrepreneurship.

(iv) To aid small and startup businesses that encounter difficulties obtaining traditional financing, governments should create corresponding financial instruments like credit lines and specific financial products. The promotion of microfinance and specialized funding has far-reaching developmental impacts, directly aiding in business activities, economic employment opportunities, and poverty alleviation.

(v) Incorporating entrepreneurship into school and university programs is important for achieving SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). Establishing entrepreneurial centers in academic institutions can help through mentorship, training, and practical exposure, enabling students to gain essential competencies for innovation and entrepreneurship, especially in the technology and services.

(vi) To tackle unemployment through vocational and entrepreneurial training offered in agriculture, manufacturing, and technology, Active Labor Market Policies should be introduced in line with SDG 8 and 1. This will assist the unemployed to transition into self-employment and small enterprises, promoting the creation of new jobs and economic activity.

(vii) To attract private investment, governments should streamline regulations and offer tax incentives etc. in priority sectors. Public-private partnerships in the light of SDG 17 (Partnerships for the Goals) can play a critical role in infrastructure development and technological advancement, while political stability and stronger governance will improve investor confidence.

(viii) Public spending should be efficiently allocated to areas such as education, health, and infrastructure in accordance with SDG 3 (Good Health and Well-being), SDG 4, and SDG 8 by building a healthier, more skilled workforce. These investments are crucial for building human capital, which in turn enhances labor productivity and supports long-term economic transformation beyond the resource sector.

6.2.2. For Efficiency and Innovation Driven Countries

In light of findings of the empirical analysis, which highlight the significant mediating role of entrepreneurship between financial intermediation and economic growth in efficiency- and innovation-driven economies, the study proposes following policy recommendations for these countries:

(i) Although financial systems are relatively developed, they should be refined to better support innovation-led and high-growth ventures rather than necessity-based entrepreneurship. This includes expanding tailored instruments such as venture capital, performance-based lending, and credit guarantees. Financial inclusion should address regional disparities and support SME financing, innovation infrastructure, and tech investment, aligning with SDG 9 and SDG 1.

(ii) Given the strong link between entrepreneurship and growth, policies should emphasize scaling high-potential, tech-driven, and export-oriented businesses. Enhancing collaboration between universities, R&D centers, and incubators can strengthen the innovation pipeline and support sectors like advanced manufacturing, clean energy, and digital services.

(iii) Unemployment should be turned into an opportunity for youth-led entrepreneurship by investing in digital and green ventures. Focused public-private initiatives can deliver skill-building and funding, especially in technical and operational competencies, in line with SDG 4 and SDG 8. This shift can transform necessity-driven initiatives into sustainable, opportunity-based enterprises.

(iv) Institutional efficiency should be improved by streamlining support for entrepreneurs and revisiting overly rigid legal frameworks. The negative influence of rule of law and government effectiveness on entrepreneurship suggests a need for more adaptive, innovation-friendly regulations that lower entry barriers and foster risk-taking in emerging sectors such as fintech and renewables.

(v) The positive impact of human development on economic growth highlights the importance of continued investment in education, healthcare, and skill development. Strengthening STEM education, digital literacy, and entrepreneurial competencies can empower individuals to launch and grow innovative ventures, enhancing both productivity and long-term development.

6.3. Limitations of the Study

The study's limitations are mentioned as under:

(i) The study covers the period from 1996 to 2020 because the World Governance Indicators (WGI) was established in 1994 whereas the data are available from 1996 onwards. While a longer time span would have provided broader insights, the unavailability of earlier data constrained the analysis to this timeframe.

(ii) This study uses self-employment as a percentage of total employment as a proxy for entrepreneurship due to the lack of consistent and comprehensive data for the Global Entrepreneurship Index (GEI) across the selected 84 countries during the study period. While the GEI offers a more nuanced measure of entrepreneurship, its limited availability and discontinuity, data being unavailable for some countries and years, make it unsuitable for time series and panel analyses. Self-employment, though broader in scope and potentially capturing both necessity and opportunity-driven entrepreneurship, is selected as a more reliable proxy for this study due to its consistent coverage and compatibility with the study's methodology.

6.4. Way Forward for Future Research

Based on the results and gaps found in this study, future research may concentrate on the following key areas:

(i) Future research may benefit from interdisciplinary approaches that integrate insights from economics, finance, sociology, and political science etc. Such studies may explore the broader social, cultural, and political factors that can affect the nexus between financial intermediation, entrepreneurship, and economic growth. Moreover, future studies may also conduct regional analysis by employing geographic variables, such as regional dummies, to identify the influence of regional effects on these interactions.

(ii) Given the global emphasis on gender equality, future research should analyze the financial intermediation's role in promoting female entrepreneurship and its

subsequent impact on economic growth. This may include studies on barriers to female entrepreneurship and the effectiveness of gender-specific financial products.

(iii) Future research may employ advanced econometric methods, such as machine learning and big data analytics, to better understand the complex relationships between financial intermediation, entrepreneurship, and economic growth. These methods can uncover hidden patterns and provide more accurate predictions.

(iv) Developing and testing policy simulation models that predict the outcomes of various financial and entrepreneurial policies may also be an important area for future research. These models can help policymakers experiment with different scenarios and make informed decisions to foster economic growth. Moreover, the impact of the Global Financial Crisis (2007–2009) can also be empirically examined in the context of the nexus between financial intermediation, entrepreneurship, and economic growth.

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Appendix- A

List of Countries

Resource Driven Countries	Efficiency Driven Countries	Innovation Driven Countries
Angola	Algeria	Australia
Bangladesh	Argentina	Austria
Barbados	Bosnia	Belgium
Belize	Denmark	Canada
Bolivia	Estonia	China
Botswana	Finland	Croatia
Burkina Faso	Greece	Czech Republic
Cameroon	Hong Kong	France
Ethiopia	Hungary	Germany
Ghana	Iceland	Japan
Guatemala	Ireland	Lithuania
Jordan	Israel	Malaysia
Kazakhstan	Italy	Netherlands
Lebanon	Jamaica	Norway
Libya	Latvia,	Poland
Madagascar	Luxembourg	Portugal
Morocco	Mexico	Qatar
Namibia	Montenegro	Singapore
Nigeria	Panama	Slovakia
Pakistan	Peru	Slovenia
Senegal	Philipines	South Korea
Suriname	Russia	Spain
Syria	Saudi Arabia	Sweden
Tonga	Serbia	Switzerland
Tunisia	South Africa	Turkey
Uganda	Thailand	United Arab
Vanuatu	Uruguay	Emirates
Vietnam		United Kingdom
Zambia		United States

Appendix-B

Analysis of Innovation Driven Economies

Entrepreneurship partially mediates the relationship of financial intermediation and economic growth. The mediation impact of entrepreneurship is 15.3 % in innovation driven economies.

Table 4.9: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.028	.008	3.31	.001
lnFI	.07	.009	7.89	.000
lnPE	.397	.013	29.79	.000
lnI	.415	.018	22.65	.000
HD	.278	.141	1.97	.049
lnTrade	.098	.009	9.93	.000
Cons	1.147	.105	17.64	.000
lnENT ←				
lnFI	.443	.026	17.25	.000
lnUN	.516	.033	15.59	.000
GE	-.048	.101	-.48	.628
RL	-.974	.085	-11.42	.000
Cons	-3.333	.328	-10.16	.000

LR test of model vs. saturated: $chi^2(6) = 499.02$, Prob > $chi^2 = 0.0000$

Table 4.10: Baron and Kenny approach & Sobel's Test

Estimates	Delta	Sobel
Indirect effect	.013	.013
Std. Err.	.004	.004
z-value	3.252	3.252
p-value	.001	.001
Conf. Interval	.005 , .020	.005 , .020

STEP 1: lnENT:lnFI (X → M) ; β=0.443 ; p=0.000
STEP 2: lnEG:lnENT(M → Y) ; β =0.029 ; p=0.001
STEP 3: lnEG:lnFI (X → Y) ; β =0.070 ; p=0.000
All the three steps and Sobel's test are significant, therefore the ***Mediation is Partial***

Table 4.11: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.013	.013
Std. Err.	.004	.004
z-value	3.252	3.194
p-value	.001	.001
Conf. Interval	.005 , .020	.005 , .020

STEP 1- lnEG:lnFI (X → Y) with β =0.070 and p=0.000
As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation **(Partial Mediation)**

Table 4.12: Effect Size of the Mediation

Ratio of indirect effect to total effect		
RIT	=	(Indirect effect / Total effect) (0.013 / 0.083) = 0.153
Ratio of indirect effect to direct effect		
RID	=	(Indirect effect / Direct effect) (0.013 / 0.070) = 0.181

Appendix-C

Analysis of Efficiency Driven Economies

Entrepreneurship partially mediates the relationship of financial intermediation and economic growth. The mediation impact of entrepreneurship is 38.7 % in innovation driven economies.

Table 4.9: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.075	.007	10.22	.000
lnFI	.045	.008	5.22	.000
lnPE	.418	.016	25.77	.000
lnI	.471	.018	25.65	.000
HD	.214	.123	1.73	.083
lnTrade	.173	.057	3.01	.003
Cons	1.942	.099	19.61	.000
lnENT ←				
lnFI	.378	.054	7.02	.000
lnUN	.328	.036	9.07	.000
GE	.282	.129	2.18	.029
RL	-1.381	.12	-11.50	.000
Cons	-3.984	.583	-6.83	.000

LR test of model vs. saturated: $chi^2(7) = 444.65$, Prob > $chi^2 = 0.0000$

Table 4.10: Baron and Kenny approach & Sobel's Test

Estimates	Delta	Sobel
Indirect effect	.029	.029
Std. Err.	.005	.005
z-value	5.785	5.785
p-value	.000	.000
Conf. Interval	.019 , .038	.019 , .038

STEP 1: lnENT:lnFI (X → M) ; β=0.379 ; p=0.000
STEP 2: lnEG:lnENT(M → Y) ; β =0.075 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.045 ; p=0.000
All the three steps and Sobel's test are significant, therefore the ***Mediation is Partial***

Table 4.11: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.029	.029
Std. Err.	.005	.005
z-value	5.785	5.785
p-value	.000	.000
Conf. Interval	.019 , .038	.020 , .038

STEP 1- lnEG:lnFI (X → Y) with β =0.045 and p=0.000
As the Monte Carlo test above is significant, STEP 1 is significant and their coefficients point in same direction, you have complementary mediation **(Partial Mediation)**

Table 4.12: Effect Size of the Mediation

Ratio of indirect effect to total effect		
RIT	=	(Indirect effect / Total effect) (0.029 / 0.074) = 0.387
Ratio of indirect effect to direct effect		
RID	=	(Indirect effect / Direct effect) (0.029 / 0.045) = 0.630

Appendix-D

Analysis of Resource Driven Economies

Entrepreneurship does not mediate the relationship of financial intermediation and economic growth in resource driven economies.

Table 4.9: Structural Equation Modeling

	Coef.	Std. Err.	Z	p-value
Structural				
lnEG ←				
lnENT	.112	.011	10.49	.000
lnFI	.058	.014	3.99	.000
lnPE	.396	.023	17.40	.000
lnI	.413	.028	14.60	.000
HD	.189	.149	1.26	.206
lnTrade	.058	.012	4.76	.000
Cons	1.536	.153	10.00	.000
lnENT ←				
lnFI	.069	.043	1.59	.112
lnUN	.891	.041	21.67	.000
GE	-1.363	.207	-6.57	.000
RL	-.440	.182	-2.41	.016
Cons	1.292	.786	1.64	.101

LR test of model vs. saturated: $chi^2(7) = 445.12$, Prob > $chi^2 = 0.000$

Table 4.10: Baron and Kenny approach & Sobel's Test

Estimates	Delta	Sobel
Indirect effect	.008	.008
Std. Err.	.005	.005
z-value	1.570	1.570
p-value	.116	.116
Conf. Interval	-.002 , .017	-.002 , .017

STEP 1: lnENT:lnFI (X → M) ; β=0.069 ; p=0.112
STEP 2: lnEG:lnENT(M → Y) ; β =0.075 ; p=0.000
STEP 3: lnEG:lnFI (X → Y) ; β =0.058 ; p=0.000

*As Step-1 as well as Sobel's test are insignificant , there is **No Mediation***

Table 4.11: Zhao, Lynch & Chen's approach to test mediation

Estimates	Delta	Monte Carlo
Indirect effect	.008	.008
Std. Err.	.005	.005
z-value	1.570	1.544
p-value	.116	.123
Conf. Interval	-.002 , .017	-.001 , .018

STEP 1- lnEG:lnFI (X → Y) with β =0.058 and p=0.000

As the Monte Carlo test above is not significant and STEP 1 is significant you have direct-only nonmediation

(No Mediation)

Appendix-E

Panel Unit Root Test

Variables	Im, Pesaran, and Shin (IPS) Test Null Hypothesis: Variable has a unit root				Order of Integration
	At Level	Results	At 1st Difference	Results	
lnEG	-0.478	NS	-7.443***	S	I(1)
lnFI	0.597	NS	-11.062***	S	I(1)
lnI	-0.279	NS	-16.449***	S	I(1)
lnPE	-0.668	NS	-9.564**	S	I(1)
lnHD	-1.067	NS	-12.532***	S	I(1)
lnENT	0.881	NS	-14.669***	S	I(1)
lnUN	-2.239	NS	-15.286***	S	I(1)
GE	-1.898	NS	-22.821***	S	I(1)
RL	-2.716**	S			I(0)
Test Critical values (MacKinnon, 1996)					
1% Level	-3.593				
5% Level	-2.932				
10% Level	-2.604				

EG for economic growth, FI for financial intermediation, I for investment, PE for public expenditure, HD for human development, ENT for entrepreneurship, UN for unemployment, GE for government effectiveness and RL for rule of law. NS is used for non-stationary series and S is used for stationary series. All the variables converted into the natural log for estimation except GE and RL as they are indices

* implies that coefficient is significant at 10% level of probability

** implies that coefficient is significant at 5% level of probability and

*** implies that coefficient is significant at 1% level of probability

NB: The study employed both the Levin, Lin & Chu (LLC) test and the Im, Pesaran, and Shin (IPS) test to assess stationarity. As both tests produced similar outcomes, the results from the IPS test, which is more commonly referenced, are presented here. The findings indicate that all variables are stationary at the first difference, except for the Rule of Law (RL), which is stationary at level.

Appendix-F

Literature Review Summary Table

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Schumpeter (1912)	The Theory of Economic Development	Introduced the role of the entrepreneur and innovation as key drivers of economic development.	Theoretical framework	Economic development is driven by entrepreneurial innovation disrupting equilibrium through creative destruction.
Schumpeter (1934)	The theory of economic development: an inquiry into profits, capital, credit, interest and the business cycle	Introduces the concept of innovation-driven economic cycles and the entrepreneur's role	Theoretical and conceptual	Entrepreneurs are key drivers of innovation and economic growth via "creative destruction"
Goldsmith (1969)	Financial Structure and Development	One of the earliest empirical analyses linking financial structure with economic development.	Cross-country empirical analysis	Positive correlation between financial development and economic growth, though causality remains ambiguous.
Shaw (1973)	Financial Deepening in Economic Development	Advocated the removal of financial repression to foster development.	Theoretical analysis	Financial liberalization enhances savings and investment, thus boosting economic growth.
Robinson (1979)	The Generalisation of the General Theory	Emphasized the demand-following role of finance rather than a supply-leading one.	Theoretical critique	Finance follows economic growth rather than initiating it; investment decisions drive credit creation.
Birch (1979)	The job generation process	First major study showing small firms as key job creators	Empirical data from U.S. firms	Small firms generate most net new jobs, shifting focus from large firms
Romer (1986)	Increasing returns and long-run growth	Developed endogenous growth theory emphasizing knowledge and increasing returns	Theoretical modeling	Knowledge accumulation drives sustained economic growth
Lucas (1988)	On the Mechanics of Economic Development	Laid theoretical foundations for endogenous growth theory.	Theoretical modeling	Knowledge accumulation is central to growth; finance indirectly influences development via capital allocation.

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Barro (1990)	Government spending in a simple model of endogenous growth	Develops a theoretical model linking public spending to long-term growth	Theoretical endogenous growth model	Productive government spending (like infrastructure) boosts economic growth
North (1990)	Institutions, Institutional Change and Economic Performance	Provides a theoretical foundation on institutions and economic outcomes	Theoretical and historical analysis	Institutions reduce uncertainty and transaction costs, influencing long-term economic growth
Porter (1990)	The Competitive Advantage of Nations	Introduces a framework explaining how nations gain and sustain competitive advantage	Case studies and macroeconomic analysis	National advantage comes from clustered industries, innovation, and strategy-supporting environments
King and Levine (1993a)	Finance and Growth: Schumpeter Might Be Right	Empirically assessed the Schumpeterian hypothesis about finance and innovation-led growth.	Cross-country regression analysis (1960–1989)	Financial development strongly predicts long-run growth, capital accumulation, and productivity.
King and Levine (1993b)	Finance, Entrepreneurship and Growth	Explored the link between financial systems, entrepreneurship, and economic growth.	Empirical analysis using firm-level and macroeconomic data	Financial systems affect the rate of innovation and entrepreneurial activity, which in turn spurs growth.
Shleifer and Vishny (1993)	Corruption	Provides a theoretical framework for understanding the economic effects of corruption	Conceptual/theoretical model	Corruption acts like a tax, distorts incentives, and is more damaging when government agencies act independently
De Gregorio and Guidotti (1995)	Financial Development and Economic Growth	Assessed how financial development affects growth in Latin America.	Panel data regression for Latin American countries	Positive short-run impact of financial development; weakens or turns negative at high levels.
Sachs and Warner (1995)	Natural resource abundance and economic growth	Introduces early empirical evidence on the resource curse	Cross-country regressions	Resource-rich countries grow slower due to poor institutions and governance issues
Devarajan (1996)	Composition of public expenditure and economic growth	Investigates how different components of public spending affect growth	Cross-country regression with public expenditure components	Reallocation of spending towards capital investment boosts growth

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Levine (1997)	Financial Development and Economic Growth: Views and Agenda	Comprehensive literature review shaping future research on finance-growth nexus.	Review of empirical and theoretical literature	Strong evidence that financial development boosts growth, though mechanisms vary. Identified future research agenda.
Barro (1997)	Determinants of economic growth	Provides a broad empirical analysis of growth drivers	Cross-country regression with policy and macro variables	Human capital, political stability, and rule of law are critical for growth
Kaminsky and Reinhart (1999)	The Twin Crises: The Causes of Banking and Balance-of-Payments Problems	Analyzed links between banking crises and currency crises.	Event-study and empirical analysis of crisis episodes	Twin crises are interrelated and typically preceded by financial liberalization and weak regulation.
Wennekers and Thurik (1999)	Linking entrepreneurship and economic growth	Connected entrepreneurship with macroeconomic growth	Theoretical synthesis	Entrepreneurship is a mechanism linking personal initiative to national economic performance
Levine et al. (2000)	Financial Intermediation and Growth: Causality and Causes	Examined causality between financial intermediary development and economic growth.	GMM dynamic panel estimation	Financial development causes growth; legal and accounting systems are critical drivers of financial development.
Beck et al. (2000)	Finance and the Sources of Growth	Disaggregated the channels through which finance influences growth (productivity vs. capital).	GMM panel regressions for 63 countries	Financial development primarily increases productivity rather than capital accumulation.
Ranis et al. (2000)	Economic growth and human development	Explores the two-way relationship between growth and human development	Empirical analysis using cross-country panel data	Growth and human development are mutually reinforcing over time
Treisman (2000)	The causes of corruption: A cross-national study	Identifies long-term political and institutional factors that influence corruption	Cross-national econometric analysis	Federalism, democracy, economic development, and Protestant traditions reduce corruption; press freedom and colonial history also matter
Gompers and Lerner (2001)	The Venture Capital Revolution	Explains the rise and role of venture capital in funding innovation	Empirical and case study approach	Venture capital is critical for high-risk innovation, especially in tech industries

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Acemoglu et al. (2001)	Colonial Origins of Comparative Development	Explores historical institutional roots of economic performance	Instrumental variable regressions using settler mortality data	Institutional quality explains much of the income divergence across former colonies
Auty (2001)	Resource abundance and economic development	Explored the paradox of resource-rich countries underperforming	Comparative case studies	Resource dependence often impedes development unless managed with strong institutions
Audretsch and Thurik (2001)	What's new about the new economy?	Identified the shift from managed to entrepreneurial economies	Conceptual analysis	Growth increasingly driven by small firms, innovation, and entrepreneurship
Beck and Levine (2002)	Industry Growth and Capital Allocation	Compares market-based vs. bank-based systems for growth	Industry-level growth regressions	Efficient capital allocation is more important than financial system type
Djankov et al. (2002)	The Regulation of Entry	Measures and analyzes entry regulations across countries	Cross-country dataset of entry procedures and economic outcomes	Higher entry barriers reduce entrepreneurship and encourage informality
Acs and Audretsch (2003)	Innovation and Technological Change	Highlights the role of innovation and entrepreneurship in economic development	Literature review	Small firms play a pivotal role in innovative activity and industrial dynamics
Baumol (2003)	Entrepreneurship: Productive, unproductive, and destructive	Differentiated types of entrepreneurship based on institutional context	Conceptual framework	Institutions determine whether entrepreneurship is growth-enhancing or rent-seeking
Baumol (2003)	Entrepreneurship: Productive, unproductive, and destructive	Distinguishes types of entrepreneurship and their societal impact	Theoretical analysis	Institutions determine whether entrepreneurship is productive, unproductive, or destructive
Beck and Levine (2004)	Stock markets, banks, and growth: Panel evidence	Assesses roles of stock markets and banks in growth	Dynamic panel GMM estimation	Both stock markets and banks contribute positively and complementarily to growth
Bloom et al. (2004)	The effect of health on economic growth	Evaluates health as a production input in growth models	Growth regressions using life expectancy and productivity data	Health improvements significantly boost labor productivity and economic growth

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Aghion et al. (2005)	The Effect of Financial Development on Convergence	Integrated Schumpeterian growth theory with convergence dynamics and finance.	Theoretical model and cross-country regression	Financial development accelerates convergence by facilitating innovation and technology adoption.
Aghion et al. (2005)	Financial development and convergence	Links financial development to income convergence	Theoretical model + cross-country regression	Financial development speeds up income convergence by boosting innovation
Beck et al. (2005)	SMEs, Growth, and Poverty	Examines how SMEs contribute to growth and poverty reduction	Cross-country panel analysis	SME development positively correlates with lower poverty and higher GDP growth
Levine (2005)	Finance and Growth: Theory and Evidence	Summarizes theoretical and empirical literature on finance-growth link	Literature review and meta-analysis	Financial development fosters growth by improving capital allocation and innovation
Acemoglu and Johnson (2005)	Unbundling Institutions	Distinguishes between property rights and contracting institutions	Cross-country panel data and IV estimation	Property rights institutions are more crucial for long-run economic growth than contracting institutions
Van Stel et al. (2005)	Entrepreneurial activity and national economic growth	Measured impact of entrepreneurship on growth	Panel data econometrics	Entrepreneurship contributes positively to GDP growth, especially in high-income countries
Acs & Varga (2005)	Entrepreneurship, agglomeration and technological change	Linked entrepreneurship with agglomeration economies and innovation	Empirical model using regional data	Agglomeration and entrepreneurship significantly drive technological change and regional growth
Acemoglu and Johnson (2005)	Unbundling institutions	Separates the role of property rights and contract enforcement in development	Cross-country econometric analysis	Property rights institutions more strongly influence long-run growth than contracting institutions
Mehlum et al. (2006)	Institutions and the resource curse	Links resource abundance with institutional quality and growth	Cross-country regressions with interaction terms	Good institutions mitigate the resource curse; poor institutions worsen it
Klapper et al. (2006)	Entry Regulation as a Barrier to Entrepreneurship	Analyzes how business regulations affect entrepreneurship	Cross-country regression analysis	Entry regulations reduce business formation and entrepreneurship, hindering growth

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Berger and Udell (2006)	Conceptual Framework for SME Finance	Proposes a new framework for understanding SME financing stages	Analytical framework	Financing needs and sources change as SMEs evolve; institutional context matters
Beck and Demirguc-Kunt (2006)	SMEs: Access to Finance as a Growth Constraint	Identifies financial access as a major barrier for SMEs	Firm-level surveys and regressions	Limited financial access constrains SME growth more than for large firms
Perotti (2007)	Fiscal policy in developing countries	Offers a framework for analyzing fiscal policies in development contexts	Conceptual and theoretical framework	Institutional quality determines effectiveness of fiscal policy in developing countries
Baptista and Thurik (2007)	Entrepreneurship and Unemployment in Portugal	Examines the relationship between entrepreneurship and unemployment	Econometric analysis on Portuguese data	Evidence of a complex bidirectional relationship; Portugal shows some unique patterns
Fisman and Svensson (2007)	Are corruption and taxation really harmful to growth?	Assesses how corruption and taxation affect firm growth in Africa	Firm-level survey data; econometric modeling	Both taxation and corruption reduce firm growth, with corruption having a stronger negative effect
Van Praag and Versloot (2007)	What is the value of entrepreneurship?	Reviewed the economic contributions of entrepreneurs	Meta-analysis	Entrepreneurs create jobs, innovate, and boost productivity, though with varying net effects
Hanushek and Woessmann (2008)	The role of cognitive skills in economic development	Assesses how educational quality, not just quantity, drives growth	Cross-country analysis using cognitive skills measures	Cognitive skills are a stronger determinant of growth than years of schooling
Acs et al. (2008)	Entrepreneurship, Economic Development and Institutions	Examines how institutions affect entrepreneurship in different development stages	Cross-country regression analysis	Entrepreneurial activity is shaped by formal and informal institutions, differing by development stage
Aidis et al. (2008)	Institutions and Entrepreneurship in Russia	Compares entrepreneurship under different institutional settings	Comparative analysis and survey data	Weak formal institutions hinder productive entrepreneurship; informal institutions partially compensate
Acs, Desai and Hessels (2008)	Entrepreneurship, economic development and institutions	Linked institutional quality with entrepreneurial outcomes	Cross-country empirical study	Strong institutions foster opportunity-based entrepreneurship

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Thurik et al. (2008)	Does self-employment reduce unemployment?	Investigated relationship between entrepreneurship and unemployment	Panel data econometrics	Self-employment can help reduce unemployment, especially in developed countries
Levie and Autio (2008)	Theoretical grounding and test of GEM	Provides theoretical basis and empirical test of Global Entrepreneurship Monitor (GEM) model	Structural equation modeling using GEM data	Entrepreneurial framework conditions influence types of entrepreneurship differently
Aghion et al. (2009)	Science, technology and innovation for economic growth	Provides a framework linking innovation policy to economic outcomes	Conceptual analysis of innovation systems	STI systems must be aligned with policy for long-term economic growth
Djankov (2009)	The regulation of entry: A survey	Summarizes empirical research on entry barriers and entrepreneurship	Literature review and data synthesis	High entry regulation leads to lower entrepreneurship, more informality, and corruption; reforms can promote business activity
Ács et al. (2009)	Entrepreneurship, growth, and public policy	Collection of studies linking entrepreneurship with economic growth and public policy	Multiple case studies and empirical chapters	Entrepreneurship is a key driver of innovation, requiring enabling policies for full impact
Afza and Rashid (2009)	Women's social well-being through enterprise in Pakistan	Analyzes the role of enterprise in improving the lives of marginalized women	Field data and qualitative interviews	Enterprise development enhances social well-being, empowerment, and income for remote women
Beck et al. (2010)	Financial Institutions and Markets Across Countries and Over Time	Provided an updated, comprehensive database for measuring financial development.	Data compilation and descriptive analysis	Enables consistent cross-country comparison of financial systems over time; highlights development gaps.
McKinnon (2010)	Money and Capital in Economic Development	Developed a framework linking financial intermediation with capital formation in developing countries.	Theoretical model	Financial repression hampers capital accumulation and growth; financial liberalization is essential for development.
Armendáriz and Morduch (2010)	The Economics of Microfinance	Theorizes how microfinance can expand financial access for the poor	Theoretical, case-based, and empirical studies	Microfinance helps reduce poverty but has mixed effects on business expansion

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Wennekers et al. (2010)	Entrepreneurship and economic development: Is it U-shaped?	Proposed a nonlinear relationship between entrepreneurship and development	Literature synthesis & empirical testing	Entrepreneurship's effect follows a U-shape across development stages
Husain (2011)	Financial sector regulation in Pakistan	Discusses financial sector reform strategies	Policy analysis	Stronger regulation is essential for inclusive and stable financial development in Pakistan
Yasin (2011)	Public spending and economic growth in Sub-Saharan Africa	Evaluates impact of public expenditure on growth	Panel regression for SSA countries	Productive government expenditure enhances growth, while consumption has limited effect
Mazzucato (2011)	The entrepreneurial state	Argues for a more active role of the state in driving innovation	Conceptual and theoretical analysis	States are key innovators and must invest proactively in technology and entrepreneurship
Levie and Autio (2011)	Regulatory burden, rule of law, and entry of strategic entrepreneurs	Investigated how institutions shape entrepreneurial entry	Panel data analysis	Rule of law positively influences strategic entrepreneurship; regulatory burden deters it
Ayyagari et al. (2011)	Small vs. young firms across the world	Distinguished the roles of firm age and size in job creation	Firm-level data from 99 countries	Young firms are major contributors to job creation, more so than small firms
Neumark et al. (2011)	Do small businesses create more jobs?	Reassessed job creation claims about small firms	National Establishment Time Series (NETS) data analysis	Job creation is more attributable to young firms rather than small firms per se
Levine (2012)	Finance, Regulation and Inclusive Growth	Linked inclusive growth with financial regulation and deepening.	Policy-oriented theoretical discussion	Sound financial regulation fosters inclusive growth by improving access and reducing instability.
Cecchetti and Kharroubi (2012)	Reassessing the Impact of Finance on Growth	Critically examined the finance-growth nexus beyond traditional positive assumptions.	Cross-country regressions and sectoral analysis	Oversized financial sectors reduce productivity growth; excessive finance can harm economic performance.
Beck (2012)	The role of finance in economic development	Highlights benefits and risks of finance for development	Conceptual review	Finance supports growth but must be regulated to reduce risks and inequality

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Welter (2012)	Trust and Entrepreneurship: A Critical Review	Reviews the literature on trust in entrepreneurship	Systematic literature review	Trust is multifaceted—personal, institutional, and cultural trust all shape entrepreneurial outcomes
Acemoglu and Robinson (2012)	Why Nations Fail	Argues institutions, not geography or culture, determine prosperity	Case studies and historical narratives	Inclusive institutions lead to growth; extractive institutions cause stagnation
Shahzad et al. (2012)	Incubation and women entrepreneurship in Pakistan	Examines how incubation affects women entrepreneurs in Pakistan	Survey-based empirical study	Incubation improves confidence, business skills, and success rates among women entrepreneurs
Greenwood et al. (2013)	Quantifying the Impact of Financial Development on Economic Development	Developed a quantitative framework to assess the impact of financial development on output.	Calibrated general equilibrium model	Financial development leads to more efficient allocation of capital and significant increases in output.
Laeven and Valencia (2013)	Systemic banking crises database	Creates a comprehensive database on banking crises	Empirical compilation and analysis	Systemic crises lead to recessions and fiscal burdens, requiring policy intervention
Sohl (2013)	Angel Investor Market in 2012	Reports trends in U.S. angel investing post-recession	Descriptive statistics	Angel investment continued recovery, supporting early-stage entrepreneurial ventures
Acs et al. (2013)	The knowledge spillover theory of entrepreneurship	Introduced a framework showing how knowledge leads to entrepreneurship	Conceptual & empirical	Knowledge creation without supportive institutions leads to underutilization unless channeled through entrepreneurship
Galindo and Méndez-Picazo (2013)	Innovation, entrepreneurship and economic growth	Explored innovation as a mediator in entrepreneurship-led growth	Econometric analysis	Innovation and entrepreneurship together have a synergistic effect on economic growth
Haltiwanger et al. (2013)	Who creates jobs?	Compared job creation by firm size and age	Longitudinal firm-level data	Young firms, not necessarily small ones, are primary job creators
Baumol (2013)	The microtheory of innovative entrepreneurship	Proposes a microeconomic model explaining innovative entrepreneurship	Theoretical model	Innovation is driven by market structure, firm strategy, and institutional setup

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Estrin et al. (2013)	Entrepreneurship, social capital, and institutions	Examines how social and commercial entrepreneurship are shaped by institutions and social capital	Cross-country empirical analysis	Strong institutions and high social capital encourage both forms of entrepreneurship
Nica (2013)	Spending allocation and entrepreneurship	Investigates public spending's effect on entrepreneurship	Empirical analysis using panel data	Education and infrastructure spending positively impact entrepreneurship; military spending does not
Gambacorta et al. (2014)	Financial Structure and Growth	Explored the effects of bank- vs. market-based financial systems on growth.	Cross-country panel regressions	Bank-based systems are more growth-enhancing in developing countries; market-based in advanced economies.
Obaji and Olugu (2014)	The Role of Government Policy in Entrepreneurship Development	Discusses how government policies impact entrepreneurial development	Conceptual analysis with examples	Supportive policies (e.g., tax incentives, infrastructure) can foster entrepreneurship; poor governance stifles it
La Porta and Shleifer (2014)	Informality and development	Analyzes the role of informality in development and entrepreneurship	Cross-country data and theoretical framework	Informality is prevalent in poor countries due to weak institutions and costly regulations; formalization can support growth
Sahay et al. (2015)	Rethinking Financial Deepening: Stability and Growth in Emerging Markets	Evaluated financial deepening's role in economic growth and stability in EMs.	Cross-country empirical analysis	Financial deepening is beneficial up to a point, beyond which it can pose risks to stability.
Arcand et al. (2015)	Too much finance?	Investigates non-linear relationship between finance and growth	Panel data analysis with interaction terms	Excessive financial development can negatively affect economic growth
Grubaugh (2015)	Economic growth and growth in human development	Measures the influence of human development on growth	Panel regression on HDI and GDP data	Positive correlation between HDI and GDP growth, especially in developing countries
Faria (2015)	Entrepreneurship and Business Cycles	Explores how entrepreneurship responds to business cycle dynamics	Theoretical model with empirical support	Innovation-driven entrepreneurship increases in downturns, helping reduce unemployment

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Acs et al. (2015)	National systems of entrepreneurship	Developed a framework for measuring national entrepreneurial ecosystems	Global Entrepreneurship and Development Index (GEDI)	Entrepreneurial performance depends on institutional, infrastructural, and policy dimensions
Stangler and Bell-Masterson (2015)	Measuring an entrepreneurial ecosystem	Proposed metrics to assess regional entrepreneurial ecosystems	Framework and indicator development	Successful ecosystems have density, fluidity, connectivity, and diversity
Acs et al. (2015)	National systems of entrepreneurship	Develops a framework to measure national entrepreneurship systems	Construction of the Global Entrepreneurship Index (GEI)	Policy effectiveness depends on systemic alignment of entrepreneurship pillars
Ayyagari et al. (2016)	Access to Finance and Job Growth	Studies how financing impacts employment in SMEs	Firm-level data from World Bank Enterprise Surveys	Firms with better access to finance create more jobs, especially among small firms
Klapper et al. (2016)	Achieving the SDGs: The Role of Financial Inclusion	Connects financial inclusion with achieving Sustainable Development Goals (SDGs)	Policy review and case-based evidence	Financial inclusion is essential for reducing poverty, improving health, and empowering women
Guerrero et al. (2016)	Entrepreneurial activity and regional competitiveness	Analyzed how universities drive regional entrepreneurial activity and competitiveness	Empirical analysis using data from European universities	Entrepreneurial universities positively influence regional competitiveness through knowledge spillovers
Demirgüç-Kunt and Singer (2017)	Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence	Reviewed empirical studies on financial inclusion and inclusive growth.	Literature review	Financial inclusion positively affects poverty reduction, consumption smoothing, and business creation.
Badeeb et al. (2017)	Natural resource curse: Literature survey	Comprehensive review of natural resource curse theories	Literature review	Resource dependence may hinder growth without strong institutions and governance
Boamah et al. (2018)	Financial depth, gross fixed capital formation and economic growth	Assesses how financial depth and capital formation contribute to growth in Asia	Panel data regression for 18 Asian countries	Both financial depth and capital formation positively influence economic growth

Author(s) and Year	Title	Contribution	Methodology	Key Findings
Elistia and Syahzuni (2018)	HDI and GDP per capita in ASEAN	Examines correlation between HDI and economic growth in ASEAN	Correlational study using ASEAN country data	Strong positive relationship between HDI and per capita income across ASEAN countries
Demirguc-Kunt et al. (2018)	Global Findex Database 2017	Provides data on global financial inclusion and digital finance	Survey-based global database	Fintech and mobile money are expanding financial access, particularly in developing countries
Spigel and Stam (2018)	Entrepreneurial ecosystems	Developed a framework for understanding entrepreneurial ecosystems	Theoretical and literature synthesis	Ecosystem success depends on interconnected cultural, social, and institutional elements
Fairlie and Fossen (2018)	Opportunity vs necessity entrepreneurship	Differentiated opportunity- and necessity-based entrepreneurship	U.S. microdata analysis	Opportunity entrepreneurs have better business outcomes and are more prevalent in stronger economies
Mustafa et al. (2018)	Role of small medium enterprises in growth of the economy	Analyzes the role of SMEs in Pakistan's economic development	Qualitative and secondary data analysis	SMEs significantly contribute to GDP and employment, but face barriers like financing and regulation
Nabi et al. (2018)	Entrepreneurship education and entrepreneurial intentions	Evaluates the impact of first-year entrepreneurship education on intentions	Survey of university students using SEM	Learning and inspiration in early education positively influence entrepreneurial intentions
Naveed and Mahmood (2019)	Financial liberalization and growth in Pakistan	Evaluates effects of liberalization on economic growth	Time series co-integration and ECM	Liberalization enhances growth but depends on macroeconomic stability
Trpeski and Cvetanoska (2019)	Gross fixed capital formation and productivity in Southeastern Europe	Links capital formation to productivity growth	Empirical productivity analysis using country data	Increased capital formation is associated with improved productivity in SEE countries
Haddad and Hornuf (2019)	The Emergence of the Global Fintech Market	Identifies key drivers behind global fintech growth	Cross-country data and empirical modeling	Economic freedom and digital infrastructure are significant predictors of fintech development
Gill et al. (2019)	Youth empowerment and sustainable development	Examines youth development under Pakistan's Prime Minister's Youth Program	Survey and econometric analysis	Program improved employability, financial independence, and youth participation in sustainable development

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Hussain et al. (2019)	Gender, microcredit and poverty alleviation in Pakistan	Studies microcredit's effect on women's poverty reduction	Field study with 500 women micro-entrepreneurs	Microcredit empowers women, boosts income, and alleviates poverty, but challenges persist in scaling businesses
Memon et al. (2019)	Entrepreneurship ecosystem and economic growth in Pakistan	Investigates the entrepreneurial ecosystem's influence on economic growth	Survey-based analysis and correlation methods	Strong entrepreneurial ecosystems drive economic growth; gaps exist in policy and institutional support
Kiani and Ali (2019)	Financial intermediation and economic growth in Pakistan	Analyzes the effect of financial sector efficiency on growth	Time series econometric analysis (1990–2017)	Financial sector development positively impacts economic growth through better intermediation
Adil and Jalil (2020)	Banking sector's financial inclusion output in Pakistan	Measures supply-side financial inclusion performance	Principal Component Analysis	Inclusion performance varies regionally; digital infrastructure needs strengthening
Tariq et al. (2020)	Financial development and growth: Threshold model for Pakistan	Examines non-linear effects of financial development on growth	Threshold regression	Financial development benefits growth only after surpassing a specific threshold
Kong et al. (2020)	Relationship between financial development, gross fixed capital formation, and growth in Africa	Investigates complex relationships between finance, investment, and growth	CCEMG and AMG panel estimation	Financial development indirectly promotes growth through capital formation
Gulcemal (2020)	Effect of HDI on GDP for developing countries	Analyzes how HDI influences economic performance in developing states	Panel data regression	HDI has a significant positive effect on GDP in developing economies
Ajide (2020)	Financial Inclusion in Africa	Evaluates whether financial inclusion promotes entrepreneurship	Panel data analysis of African economies	Financial inclusion significantly promotes entrepreneurship in African countries
Demirguc-Kunt et al. (2020)	The Global Findex Database 2017	Updates financial inclusion data globally and explores usage patterns	Global survey data (Findex database)	Digital finance is increasing access, but gaps remain, especially for women and the poor
Javed (2020)	Youth development in Pakistan: A provincial analysis	Compares youth development indicators across provinces	Descriptive analysis using secondary data	Disparities exist across provinces in education, health, and employment; need for targeted youth policies

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Yakubu and Abdallah (2021)	Financial intermediation and growth in Sub-Saharan Africa	Explores banks' intermediation function in SSA	Panel data using fixed/random effects	Financial intermediation significantly contributes to growth in SSA
Yakubu et al. (2021)	Financial intermediation and growth: Evidence from Turkey	Revisits financial intermediation's impact in Turkey	ARDL bounds testing	Financial intermediation promotes growth in both short and long term
Afzal et al. (2021)	Impact of financial development indicators on economic growth in Pakistan	Assesses the impact of various financial development indicators on economic growth	Time series analysis using ADF, Johansen co-integration, and ECM	Financial development indicators significantly influence Pakistan's economic growth
Saleem et al. (2021)	Islamic financial depth, financial intermediation, and sustainable economic growth	Explores the role of Islamic financial development on economic sustainability	ARDL bounds testing approach	Islamic financial depth and intermediation positively affect sustainable growth
Gurdal et al. (2021)	The relationship between tax revenue, government expenditure, and economic growth in G7 countries	Examines fiscal policy's impact on growth in G7 economies	Time and frequency domain causality approaches	Bidirectional causality between government expenditure and growth; results vary across time and frequency
Rahim et al. (2021)	Natural resources, human capital, and growth in N-11 countries	Tests the resource curse in the presence of human capital	Panel data analysis for Next Eleven countries	Human capital development can neutralize the negative effects of resource dependence
Taqi et al. (2021)	Human development index and economic growth: Pakistan case study	Analyzes the bidirectional relationship between HDI and growth	Time series analysis	Economic growth and HDI are positively linked; policies must target both for sustainable development
Dutta & Meierrieks (2021)	Financial Development and Entrepreneurship	Reassesses finance's role in promoting entrepreneurship	Dynamic panel GMM estimation	Financial development supports opportunity-driven entrepreneurship but not necessity-driven

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Edwards (2021)	Entrepreneurs and regulations: Removing state and local barriers to new businesses	Discusses how regulatory barriers at subnational levels inhibit new firm formation in the U.S.	Policy analysis and case studies	Reducing occupational licensing, zoning laws, and permit delays can significantly boost entrepreneurship
Burchi et al. (2021)	Financial literacy and sustainable entrepreneurship	Explored the impact of financial literacy on sustainable entrepreneurship	Empirical analysis using survey data	Financial literacy significantly enhances the likelihood of engaging in sustainable entrepreneurial ventures
Qureshi et al. (2021)	Incubation and acceleration in Pakistan	Explores business incubation's role in building Pakistan's entrepreneurial ecosystem	Case studies and policy analysis	Incubators enhance entrepreneurial capacity through mentorship, funding, and networking
Arfeen and Saranti (2021)	Digital government and sustainable development in Pakistan	Assesses how digital governance contributes to sustainability goals	Case study and policy analysis	Digital government strategies promote inclusive and transparent governance supporting development
Mehmood and Fraz (2022)	The poor state of financial markets in Pakistan	Highlights structural weaknesses and inefficiencies in financial markets	Descriptive analysis and institutional review	Pakistan's financial markets are underdeveloped and lack integration with global systems
Du et al. (2022)	New infrastructure investment and economic growth quality in China	Studies how infrastructure affects the quality, not just quantity, of growth	Empirical analysis using provincial data in China	New infrastructure enhances green, inclusive, and sustainable growth quality
Li et al. (2022)	Digital Financial Inclusion, Innovation and Entrepreneurship	Analyzes how digital financial inclusion influences innovation networks	Network analysis and panel data econometrics	Digital inclusion enhances regional entrepreneurship and promotes innovation collaboration
Audretsch et al. (2022)	Necessity or opportunity? Government size, tax policy, corruption, and implications for entrepreneurship	Examines how government characteristics influence types of entrepreneurship	Cross-country panel regression	Larger governments and higher corruption promote necessity-driven entrepreneurship; tax policy affects opportunity-based entrepreneurship
Kim et al. (2022)	Entrepreneurship and economic growth: A cross-section empirical analysis	Provided updated empirical evidence on entrepreneurship-growth link	Cross-country regression analysis	Strong positive relationship between opportunity-driven entrepreneurship and GDP growth

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Van Rijnsoever (2022)	Intermediaries for the greater good	Shows how support organizations help embed sustainable startups in ecosystems	Qualitative case study of Dutch intermediaries	Intermediaries act as system builders, aligning sustainability goals with ecosystem support
Smallbone et al. (2022)	Internationalisation and SME innovation	Assesses how internationalization drives innovation in SMEs across economies	Empirical comparison using survey data	Internationalization significantly boosts SME innovation, more in efficiency-driven than factor-driven economies
Dutta et al. (2023)	Global Innovation Index 2023	Global benchmarking of innovation amid uncertainty	Composite index and cross-country analysis	Innovation remained resilient; policy support matters in crisis contexts
Ansari et al. (2023)	A study on non-performing loans of the Pakistani banking industry during different political regimes	Examines political influences on non-performing loans (NPLs) in Pakistan	Comparative regime-wise analysis using historical data	Political instability correlates with rising NPLs in the banking sector
Del-Aguila-Arcentales et al. (2023)	Innovation and SDGs compliance in the EU	Analyzes the role of innovation in achieving SDGs and competitiveness	Quantitative cross-country analysis	Innovation enhances SDG compliance and global competitiveness in the EU
Sebri et al. (2023)	Public spending and the resource curse in WAEMU countries	Investigates asymmetric effects of public spending in resource-rich WAEMU countries	Hidden cointegration and non-linear panel ARDL	Public spending has asymmetric effects; inefficient spending exacerbates resource curse
Hameed et al. (2023)	Inclusive entrepreneurial ecosystems	Proposed a conceptual and measurement framework for inclusive ecosystems	Conceptual model development and indicator analysis	Inclusive ecosystems promote broader participation and equitable entrepreneurial outcomes
Feyen et al. (2023)	Fintech and the future of finance	Discussed fintech's transformation of financial markets and policies	Policy analysis and global case studies	Fintech enhances financial inclusion and competition but poses new regulatory challenges
Kumar and Alwi (2023)	Entrepreneurial training and economic growth	Assesses the link between entrepreneurship training and growth	Empirical study using survey data from training institutions	Entrepreneurial training contributes to skill development and positively correlates with GDP growth
Ramesh and Guruprasad (2024)	Digital financial inclusion and growth in Asia	Links digital finance to growth	Panel data analysis of Asian economies	Digital inclusion promotes growth, especially in lower-income countries

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Liu et al. (2024)	Digital technology diffusion and banking efficiency in Pakistan	Studies digital tech's role in banking sector efficiency	Stochastic frontier analysis + panel data	Digital diffusion enhances banking efficiency and convergence
Ishfaq et al. (2024)	Causal linkages between financial development and economic growth	Investigates the direction of causality between finance and growth in Pakistan	Granger causality and VECM	Bidirectional causality exists between financial development and economic growth