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The Impact of COVID-19 on Entrepreneurship and Economic Outcomes in Emerging Markets: A Difference-in-Differences Approach

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A B S T R A C T

Background: The COVID-19 pandemic profoundly disrupted global economic systems, with emerging markets facing unique challenges due to structural vulnerabilities and limited institutional resilience. While existing literature has explored macroeconomic shocks, the specific effects on entrepreneurship and the role of policy interventions in mitigating these impacts remain underexamined. This study addresses this gap by analyzing how the pandemic affected entrepreneurial activity and broader economic outcomes in emerging markets, with a focus on the efficacy of government responses and adaptive strategies.

Methods: A quasi-experimental Difference-in-Differences (DID) approach was employed to compare pre- and post-pandemic entrepreneurship indicators and macroeconomic data across 15 emerging markets. Data were sourced from the World Bank Enterprise Surveys, International Labour Organization (ILO), and national statistical agencies (2018–2022). Variables included business closure rates, Small and Medium-sized Enterprises (SME), investment levels, unemployment trends, fiscal stimulus allocations, and digital technology adoption. Robustness checks accounted for cross-country heterogeneity in income levels, industrial composition, and institutional quality.

Results: The pandemic triggered a 27% average increase in business closures and a 15% decline in SME investment across sampled countries. Unemployment rates rose by 9.3%, disproportionately affecting informal sectors. Government interventions, particularly fiscal stimulus packages exceeding 5% of gross domestic product (GDP) and targeted SME tax relief, reduced closure rates by 12% and preserved 8% of jobs. Digital transformation including e-commerce adoption, mitigated revenue losses by 18% in sectors with high pre-pandemic digital readiness. Cross-country analysis revealed that lower-middle-income economies experienced 35% greater entrepreneurial disruption than upper-middle-income counterparts, highlighting the role of institutional resilience and industrial diversification.

Conclusion: The COVID-19 crisis underscored the fragility of entrepreneurial ecosystems in emerging markets, and also demonstrated the critical role of adaptive policies and digital infrastructure. Sustainable recovery requires integrated strategies combining fiscal support, institutional capacity-building, and technology-driven entrepreneurship. This study contributes to policy discourse by quantifying the efficacy of interventions and providing a framework for enhancing economic resilience in future crises.

Keywords: COVID-19, Entrepreneurship, Emerging Markets, Difference-in-Differences, Economic Resilience

Introduction

The pivotal role of entrepreneurship in driving economic development and growth has long been recognized in both academic literature and policy discussions. Prior to the onset of the COVID-19 pandemic, entrepreneurs were widely viewed as key catalysts for economic transformation, contributing significantly to gross domestic product (GDP) growth, job creation, and

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innovation (1). Scholars (2-3) have highlighted how entrepreneurs act as agents of change by introducing new technologies, optimizing resource allocation, and enhancing market efficiency. Small and medium-sized enterprises (SMEs), frequently born out of entrepreneurial activity, are particularly crucial in emerging markets, where they serve as substantial sources of employment and innovation (4). Yet, the emergence of the pandemic disrupted global and local economies, with emerging markets—already vulnerable due to structural fragility, underdeveloped healthcare and financial systems, and large informal sectors—bearing the brunt of its impact (5).

The COVID-19 pandemic brought about widespread disruptions across all sectors of the economy, with emerging markets being disproportionately affected. Countries such as Brazil, India, South Africa, Turkey, and Indonesia experienced severe economic contractions, a surge in business closures, and dramatic increases in unemployment (6). This context underscores the need to examine the effects of the pandemic on entrepreneurial activities and macroeconomic outcomes, offering valuable insights for researchers and policymakers seeking to devise effective recovery strategies.

From a macroeconomic perspective, key indicators such as GDP growth, unemployment, inflation, income distribution, and investment are central to evaluating the health of an economy (7). Entrepreneurship affects these indicators through the creation of new businesses, job generation, and resource allocation toward innovative activities. However, the pandemic-induced disruptions posed significant barriers to entrepreneurial endeavors, complicating the process of starting, scaling, and innovating businesses. Demand shocks, supply chain disruptions, and changes in consumer behavior exacerbated these challenges, resulting in widespread uncertainty and a slowdown in entrepreneurial activity (8).

This paper aims to assess the causal impact of the COVID-19 pandemic on entrepreneurial activity and macroeconomic performance in a sample of emerging economies, utilizing the Difference-in-Differences (DID) methodology. By comparing pre- and post-pandemic indicators such as business registration rates, self-employment shares, and startup performance, the study offers insights into the scale and nature of the pandemic effects. It also explores how changes in entrepreneurial dynamics correlate with broader economic outcomes, including GDP growth, unemployment, and income inequality.

Recent studies have emphasized that SMEs—representing the backbone of entrepreneurship in emerging markets—were especially vulnerable during the pandemic. Research (9-10) has highlighted the susceptibility of small businesses to liquidity shocks, particularly when compounded by government-imposed lockdowns and social distancing measures. Furthermore, digital infrastructure became a critical determinant of business resilience, as firms with greater access to e-commerce platforms and digital tools adapted more effectively to the pandemic constraints (11). This underscores the importance of fostering digital transformation to sustain entrepreneurial activity, particularly during crisis.

While the pandemic effects on entrepreneurship have been largely negative, it also underscored the potential for innovation and recovery in certain sectors. Countries with robust digital infrastructure, effective government support programs, and resilient financial systems were able to mitigate some of adverse impacts on entrepreneurship (12). For instance, Turkey and South Africa implemented targeted fiscal interventions such as subsidized loans and tax deferrals, helping to alleviate immediate pressures faced by entrepreneurs. In contrast, nations with weaker institutional frameworks or greater financial constraints—such as Brazil and Indonesia—suffered more prolonged setbacks in their entrepreneurial ecosystems.

Despite the expanding body of literature on the pandemic effects on entrepreneurship, there are significant gaps in understanding the longer-term implications for entrepreneurial ecosystems in

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emerging markets. This study seeks to address this gap by providing a comprehensive analysis of changes in entrepreneurial activity during and after the pandemic, and their subsequent effects on broader economic outcomes. It also evaluates the policy responses that have been most effective in supporting entrepreneurial recovery and macroeconomic stabilization in these economies.

The study aim is to examine the multifaceted impact of the COVID-19 pandemic on entrepreneurial ecosystems in emerging economies and their interplay with macroeconomic recovery. It seeks to answer three key research questions: (1) "How did the pandemic affect entrepreneurial activities—including business formation, self-employment, and startup growth—in these regions?", (2) "What are the causal linkages between shifts in entrepreneurship and macroeconomic indicators such as GDP growth, unemployment, and income inequality?", and (3) "What are the policy measures or structural factors that enable faster entrepreneurial recovery and economic stabilization after the pandemic?". To address these questions, the study aims to (1) quantify pandemic-driven changes in entrepreneurship using pre- and post-pandemic data, (2) employ econometric methods to estimate the bidirectional relationship between entrepreneurial dynamics and macroeconomic outcomes, and (3) identify effective policy interventions—such as fiscal support, regulatory flexibility, or access to financing—that mitigated adverse effects on entrepreneurship and fostered sustainable recovery. By bridging empirical analysis with policy insights, this research strives to inform strategies for enhancing resilience in emerging markets during systemic crises.

This study contributes to the growing body of literature on entrepreneurship in emerging markets, particularly in the context of global crises, and provides actionable policy insights for governments and international organizations. By shedding light on the critical intersections between entrepreneurship and macroeconomic stability, the research aims to inform strategies that enhance resilience and foster long-term economic growth in the post-pandemic era.

Entrepreneurship and Economic Growth

The foundational theories linking entrepreneurship to economic growth can be traced back to (3) studies. Schumpeter argued that entrepreneurs are the primary drivers of economic development, acting as agents of change who introduce innovations in production processes, new products, or managerial techniques. These innovations trigger cycles of economic expansion, renewal, and creative destruction. This view of entrepreneurship as a transformative force is further supported by endogenous growth models (13), which emphasize the role of human capital, technological innovation, and knowledge accumulation in driving sustainable economic growth. Entrepreneurs, in this context, are seen not only as creators of new businesses, but also as the catalysts for long-term prosperity.

In contrast to Schumpeter's innovation-driven model, Kirzner introduced the concept of "entrepreneurial discovery," which focuses on the ability of entrepreneurs to recognize and exploit market inefficiencies or imbalances. For Kirzner, entrepreneurs identify opportunities for improvement that others may overlook, thereby enhancing market efficiency and contributing to optimal resource allocation. Network-based theories of entrepreneurship (14) underscore the importance of social and financial networks in fostering entrepreneurial success. These connections can facilitate business development by enabling knowledge transfer, access to capital, and the creation of industrial clusters, ultimately contributing to regional and national economic growth.

While these theoretical perspectives offer different views on the mechanisms through which entrepreneurship stimulates economic development, they converge on a central tenet: entrepreneurship, whether driven by innovation or the identification of market opportunities, is crucial to enhancing productivity, job creation, and

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economic well-being. This understanding has prompted policymakers to recognize the critical role of entrepreneurship in national development, leading to efforts aimed at improving access to finance, fostering favorable business environments, and strengthening institutional frameworks (15).

Empirical studies consistently demonstrate a positive correlation between entrepreneurial activity and key macroeconomic indicators such as GDP growth, employment rates, and income distribution (16). A study (4) reported that countries with higher levels of entrepreneurial activity, including startup formation and innovation, tend to exhibit stronger economic growth and higher employment shares in the private sector. Similarly, studies within the European Union have shown that during periods of economic expansion, particularly when access to credit is more favorable, entrepreneurial activity increases, contributing to lower unemployment rates (17-19). However, this relationship is not always straightforward. Factors such as institutional quality, legal frameworks, and education systems play a significant role in either supporting or hindering entrepreneurship. In emerging markets, where a substantial proportion of businesses operate informally, measuring the true level of entrepreneurial activity becomes challenging, leading to potential ambiguities in empirical findings. Despite these challenges, there is general agreement that entrepreneurship is a vital driver of innovation and job creation, central to improving macroeconomic performance (20).

The Impact of Macroeconomic Shocks on Entrepreneurship

The literature on the effects of macroeconomic shocks on entrepreneurship has evolved significantly since the 2008 global financial crisis, which highlighted how liquidity shocks and reduced investor confidence can disrupt the financing of startups and innovative businesses (21). The contraction in credit availability and the reduced lending capacity of financial institutions were major obstacles for entrepreneurs, especially in Europe, where the crisis led to severe constraints in access to finance (22).

Additionally, economic crises are frequently accompanied by a decline in both domestic and foreign demand, further exacerbating the challenges faced by entrepreneurs. When demand contracts, entrepreneurs are less likely to start or expand their businesses due to diminished market opportunities. Moreover, heightened uncertainty during times of crisis may deter potential entrepreneurs from pursuing new ventures, leading to a general slowdown in entrepreneurial activity (23). In many cases, the entry rate of new businesses decreases significantly, unless countervailing factors such as responsive fiscal and monetary policies or supportive institutional frameworks are in place.

Research identifies several key mechanisms through which macroeconomic shocks affect entrepreneurship. First, credit constraints tighten during economic distress as financial institutions curtail lending amid heightened default risks, limiting entrepreneurs' access to affordable capital critical for launching or scaling ventures. Second, demand shocks—driven by reduced consumer purchasing power and business investment—suppress market opportunities, dampening incentives for business creation or expansion. Moreover, heightened uncertainty during crises amplifies risk aversion among investors and entrepreneurs, delaying or derailing innovative ventures due to fears of economic instability. Finally, rising unemployment often spurs necessity entrepreneurship, where individuals start businesses as a survival strategy amid scarce formal employment opportunities (24). These interconnected mechanisms—credit limitations, demand contraction, risk aversion, and labor-market pressures—shape entrepreneurial behavior, often redirecting activities toward survivalist ventures rather than opportunity-driven growth, with implications for long-term economic resilience.

These mechanisms were evident in past crises and were similarly observed during the COVID-19 pandemic. While demand and credit constraints

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exacerbated the challenges faced by entrepreneurs, rising unemployment also pushed many individuals into entrepreneurship, albeit under duress.

Pandemics and Economic Consequences

Pandemics have long been associated with significant economic disruptions. The Spanish flu of 1918, for example, led to substantial workforce losses and economic stagnation in Europe (25). More recent pandemics, such as SARS and H1N1, although less severe, also had notable impacts on both local and global economies. These pandemics caused disruptions in supply chains, reduced consumer spending, and forced temporary recessions (26). The economic consequences of pandemics are multifaceted, ranging from labor shortages and reduced productivity to global recessions, all of which can inhibit entrepreneurial activity.

In the face of such disruptions, the concept of entrepreneurial resilience has gained significant attention. Entrepreneurial resilience refers to the ability of businesses, especially SMEs, to adapt and continue operations despite the adverse effects of crises (27). Factors such as access to digital technologies, flexible supply chains, and effective government support can help businesses remain operational during challenging times. Early studies on the COVID-19 pandemic indicate that SMEs that could pivot to online sales or remote services experienced better survival rates and were more likely to maintain profitability (28-29).

COVID-19 in Emerging Markets

Emerging markets face unique vulnerabilities during crises due to factors such as limited fiscal capacity, underdeveloped health infrastructures, and a high prevalence of informal sectors (30-31). These economies often rely heavily on foreign investments and commodity exports, which can be severely affected by global demand reductions and trade restrictions. The resulting currency depreciations and market contractions further limit entrepreneurial opportunities.

In addition, informal employment, which accounts for a significant proportion of the labor force in emerging markets, exacerbates vulnerability during economic or health-related shocks. Workers and entrepreneurs in the informal sector lack access to official social safety nets, making them more susceptible to the adverse effects of crises (5). Without access to credit or efficient insurance mechanisms, many entrepreneurs in these regions face heightened risks during economic downturns.

Despite extensive research on the global impact of COVID-19, there are notable gaps in studies that specifically examine the pandemic effects on entrepreneurship in emerging economies. While descriptive case studies and comparisons have provided valuable insights into the vulnerabilities of entrepreneurs, there is a need for more robust causal analyses. Specifically, quasi-experimental methods such as the DID approach are essential for isolating the impact of the pandemic from other structural and cyclical factors, providing a clearer understanding of the true effects on entrepreneurial activity and macroeconomic outcomes (32).

Although the literature has extensively explored the role of entrepreneurship in economic growth and the effects of macroeconomic shocks on entrepreneurial behavior, the specific impact of global pandemics, such as COVID-19, on entrepreneurship in emerging markets remains underexplored. There is a notable lack of systematic, econometric studies that isolate the causal impact of pandemics on entrepreneurial outcomes, particularly using approaches like DID.

This study aims to address this gap by applying the DID methodology to a multi-country panel data model, utilizing data from international sources (40-42, 4). This approach will allow for a comprehensive analysis of the relationship between entrepreneurship and macroeconomic performance before and after the pandemic, shedding light on the specific vulnerabilities of entrepreneurial ecosystems in emerging markets.

This study makes three key contributions to the literature on crises and entrepreneurship. First, it employs DID approach to rigorously estimate the

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causal effects of the COVID-19 pandemic on entrepreneurial activity and macroeconomic indicators, advancing beyond correlational analyses prevalent in existing research. Second, it focuses on emerging markets, whose distinct economic, institutional, and social structures—such as informal labor markets, weaker social safety nets, and higher reliance on microenterprises—reveal unique patterns of shock susceptibility and recovery trajectories, offering insights often overlooked in studies centered on developed economies. Third, by synthesizing empirical findings, the study provides targeted policy recommendations to guide decision-makers in rebuilding resilient business ecosystems after pandemic, such as enhancing credit access, formalizing informal sectors, and designing adaptive regulatory frameworks. This study fills a critical gap by delivering a causal, context-specific analysis of pandemic-driven disruptions in emerging markets, while equipping policymakers and international organizations with evidence-based strategies to mitigate the socioeconomic impacts of future crises and foster sustainable entrepreneurial recovery.

Conceptual Framework

The COVID-19 pandemic has undoubtedly created unprecedented challenges for global economies, particularly in emerging markets where institutional and structural vulnerabilities often exacerbate economic downturns. This section outlines the conceptual framework and research methodology employed to investigate the impact of the pandemic on entrepreneurship and subsequent macroeconomic outcomes in emerging economies. The research uses DID approach to explore how entrepreneurial activities and economic indicators have been shaped by the crisis, with particular attention paid to the mediating role of policy interventions, digital infrastructure, and market flexibility.

At the heart of this study is a theoretical model that integrates entrepreneurship with macroeconomic outcomes during crisis. The framework seeks to elucidate both direct and indirect pathways through which the pandemic has affected economic performance, including the effect of entrepreneurial activity on broader macroeconomic variables and the role of government policies in mediating these effects. By focusing on entrepreneurship as a central variable in driving economic recovery and resilience, this research aims to offer insights into the mechanisms through which entrepreneurial dynamism can either exacerbate or mitigate economic crises. The study empirical analysis, using data from emerging markets, provides an opportunity to examine these dynamics in the context of countries that have faced both health and economic challenges more acutely than advanced economies.

The link between entrepreneurship and macroeconomic outcomes is well-established in economic theory, particularly within the framework of innovation and creative destruction (3). Entrepreneurship, through its role in introducing new business ideas, products, and services, can stimulate economic growth by fostering competition, increasing productivity, and generating new employment opportunities. However, the COVID-19 pandemic has disrupted this dynamic in profound ways, creating both immediate shocks to entrepreneurial activity and long-term challenges for economic recovery.

The conceptual framework developed for this study posits that the pandemic operates through both direct and indirect pathways to affect entrepreneurial outcomes and, in turn, macroeconomic performance. Directly, the pandemic creates immediate disruptions in entrepreneurial activity by restricting business operations, hindering new firm formation, and reducing the self-employment rate. These disruptions are primarily caused by health and safety measures, such as lockdowns, social distancing, and border closures, which limit access to markets, reduce consumer demand, and prevent face-to-face interactions essential for many business operations. Moreover, the pandemic induces widespread uncertainty, which can dampen entrepreneurial spirit and reduce the appetite for risk-taking.

Indirectly, the effects of COVID-19 on

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entrepreneurship are shaped by government policies and institutional responses. Government interventions, such as financial stimulus packages, subsidies, and tax relief programs, can help mitigate the negative impact of the pandemic on entrepreneurs, particularly in emerging markets where financial resilience is often limited. Similarly, the availability of digital infrastructure and market flexibility plays a crucial role in supporting entrepreneurs during the crisis. Countries with robust digital ecosystems and flexible labor markets have been better able to adapt to the disruptions caused by the pandemic, facilitating the survival and growth of startups even in the face of economic turmoil.

The framework therefore highlights the importance of understanding both the direct effects of the pandemic on entrepreneurial activity and the moderating role of government policies, infrastructure, and institutional factors in shaping the overall impact on macroeconomic outcomes. By integrating these pathways, the study aims to provide a comprehensive understanding of how the pandemic has affected entrepreneurial dynamics and the broader economic recovery process in emerging markets.

Materials and Methods

This study focuses on emerging markets as the primary context for investigating the impact of the COVID-19 pandemic on entrepreneurship and macroeconomic outcomes. Emerging markets are characterized by a combination of rapid economic growth, increased integration into global markets, and greater vulnerability to external shocks. These economies often face unique challenges, including weaker institutional frameworks, less-developed financial systems, and higher levels of informality in entrepreneurship, which make them more susceptible to the disruptions caused by global crises such as COVID-19.

The selection of countries within this group was guided by several factors. First, the study includes a diverse sample of emerging markets to account for varied responses to the pandemic, which have been shaped by differences in institutional capacity, government interventions, and pre-existing economic conditions. Second, the focus is on countries that provide comprehensive and comparable data on key indicators of entrepreneurship and macroeconomic performance, ensuring the robustness and reliability of the analysis. By including large emerging economies, such as Brazil, India, and South Africa, and smaller, more open economies, such as those in Southeast Asia and Sub-Saharan Africa, the study aims to capture the full range of experiences and outcomes resulting from the pandemic.

The sample size for the study includes over 50 countries, offering a broad cross-section of emerging markets to explore the heterogeneity in the impacts of COVID-19 on entrepreneurial activity and economic performance. This diverse sample allows for a more nuanced understanding of the complex relationships between entrepreneurship, policy interventions, and macroeconomic outcomes in the context of a global health crisis.

The primary methodological approach employed in this study is the DID technique. This method is particularly suited for examining the causal effects of a policy intervention or external shock on a set of outcomes by comparing the differences in outcomes between treatment and control groups before and after the intervention (29). In the case of this study, the intervention is the onset of the COVID-19 pandemic, and the outcomes of interest are entrepreneurial activities and macroeconomic indicators such as GDP growth, unemployment rates, and inflation.

The DID approach is well-suited to this research for several reasons. First, it allows for a comparison of countries that were differently affected by the pandemic, controlling for pre-existing trends in entrepreneurship and economic performance. By comparing changes in entrepreneurial outcomes and macroeconomic indicators in countries that experienced varying levels of COVID-19 impact, the DID method enables us to isolate the causal effects of the

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pandemic on these variables. This is particularly important in the context of a global crisis, where the effects of the pandemic are not uniform across countries or regions.

The model specification for the DID analysis includes several key variables, including indicators of entrepreneurial activity (e.g., new business registrations, self-employment rates), macroeconomic performance (e.g., GDP growth, unemployment rates), and policy interventions (e.g., government spending, financial stimulus packages). The DID model will also incorporate control variables to account for other factors that may affect entrepreneurship and economic performance, such as pre-existing economic conditions, levels of digital infrastructure, and the maturity of the entrepreneurial ecosystem in each country.

The data for this study are drawn from a variety of reputable international sources to ensure the accuracy and consistency of the indicators used. Key sources include the World Bank, the International Monetary Fund (IMF), the Global Entrepreneurship Monitor (GEM), and national statistical agencies. These data sources provide comprehensive information on entrepreneurship rates, macroeconomic performance, and policy interventions, all of which are crucial for the analysis.

Entrepreneurial activity is measured using indicators such as new firm registrations, self-employment rates, and the level of innovation and investment in startups. These data are drawn primarily from the World Bank's Doing Business reports, GEM surveys, and national company registration records. Macroeconomic performance is assessed through a range of indicators, including GDP growth, unemployment rates, inflation rates, and investment levels. These indicators are sourced from the World Bank's World Development Indicators (WDI) database and IMF data on economic performance.

The study also includes data on government policies and interventions, particularly those related to pandemic response, such as financial stimulus packages, tax relief programs, and other forms of government support for businesses. These data are obtained from the Oxford COVID-19 Government Response Tracker (33), which provides detailed information on the policy measures implemented in different countries in response to the pandemic.

The timeframe for the analysis included three distinct periods: the pre-pandemic period (2018-2019), the pandemic period (2020-2022), and the post-pandemic period (2022-2023). This allows for a comparison of entrepreneurial activity and macroeconomic outcomes before, during, and after the pandemic, providing insights into both the short-term and long-term effects of the crisis.

In econometric analysis, DID model was employed to estimate the causal impact of the COVID-19 pandemic on entrepreneurship and macroeconomic outcomes. The basic DID model is specified as follows:

$$Y_{it} = \alpha + \beta_1 Post - Pandemic_{it} + \beta_2 Treatment_i + \gamma X_{it} + \varepsilon_{it}$$

Where Y_{it} represents the outcome of interest (e.g., entrepreneurial activity or macroeconomic performance) for country i at time t, Post-Pandemic$_{it}$ is a binary variable indicating the post-pandemic period, and Treatment$_i$ is an indicator variable for whether a country was subject to the pandemic's economic shocks. The vector X_{it} includes control variables that account for other factors affecting entrepreneurship and economic outcomes, such as government policy measures and country-specific characteristics. ϵ_{it} is the error term.

In the provided DID model, the binary variables are coded as follows:

- **Post-Pandemic$_{it}$**:
  - **1**: Observations from the post-pandemic period (after the onset of COVID-19).
  - **0**: Observations from the pre-pandemic period (before COVID-19).

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- **Treatment$_i$**:
  - **1**: Countries classified as the treatment group (those directly subject to the pandemic economic shocks).
  - **0**: Countries classified as the control group (those not directly subject to the pandemic shocks or used as a baseline for comparison).

The DID model was estimated using both fixed effects and random effects specifications to control for unobserved heterogeneity across countries and time periods. Robustness checks were conducted to ensure the validity of the results, including testing for parallel trends before the pandemic and examining the sensitivity of the results to different model specifications.

Interpretation of the results focused on the magnitude and direction of the impact of COVID-19 on entrepreneurship and macroeconomic performance, with particular attention paid to the moderating role of government policies and institutional factors. The study found that the pandemic had a negative impact on entrepreneurial activity, particularly in countries with weaker policy responses and less-developed digital infrastructures. However, it was anticipated that government interventions, such as financial stimulus packages and digital support measures, mitigated some of the negative effects, particularly in countries with more robust policy frameworks and institutional capacities. The results of the DID model provided insights into how these interventions shaped the recovery trajectory of entrepreneurship and its subsequent impact on broader macroeconomic variables, such as GDP growth, employment, and unemployment rates.

One key aspect of the analysis was the expected variation in the effects of the pandemic across different types of emerging markets. It was hypothesized that countries with stronger entrepreneurial ecosystems and better access to digital infrastructure and financing options demonstrated a faster recovery in terms of entrepreneurial activity and economic growth. Conversely, countries with more severe structural weaknesses, such as high levels of informality, less access to financing, and weaker health and digital infrastructure, were expected to experience more significant disruptions to their entrepreneurial sectors and slower economic recovery.

The robustness checks included testing for parallel trends in the pre-pandemic period to ensure that the DID assumptions hold. Sensitivity analysis was also conducted by varying the specifications of the model, such as including different control variables or using alternative measures of entrepreneurial activity, to verify the robustness of the findings. Both fixed and random effects models helped account for potential unobserved heterogeneity across countries and over time, which is particularly important given the diversity of the sample and the complexities of the pandemic impact on different national contexts.

Finally, the study also examined the interaction between different types of policy interventions and the broader economic outcomes in the post-pandemic period. It was expected that countries that invested heavily in digital infrastructure and provided comprehensive financial support to startups showed a stronger recovery in terms of both entrepreneurial activity and macroeconomic performance. Conversely, nations with weaker policy interventions, or those that failed to address the specific challenges faced by entrepreneurs during the pandemic, may show more pronounced declines in entrepreneurial outcomes and slower overall economic recovery.

Results

This section presents the empirical analysis of the impact of the COVID-19 pandemic on entrepreneurship and macroeconomic outcomes in emerging markets. Using the DID approach, the study investigateed how the pandemic affected entrepreneurial activity and broader economic performance, focusing on key indicators such as new business registrations, SME survival rates, GDP growth, unemployment, and inflation. The results were analyzed in light of government policy

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responses, with special attention given to countries with strong versus weak interventions and their respective outcomes. Sectoral variations in the pandemic impact were explored, highlighting the role of digital transformation and the resilience of essential industries.

To understand the broader impact of the COVID-19 pandemic on entrepreneurship and macroeconomic performance, the study first provided a descriptive overview of key trends before and after the pandemic. Data from selected emerging markets were analyzed, focusing on a range of entrepreneurial and macroeconomic indicators.

The data showed significant changes in entrepreneurship and macroeconomic performance across the studied countries. Table 1 presents a summary of the pre-pandemic (2018–2019) and post-pandemic (2020–2022) values for entrepreneurial and macroeconomic indicators.

Table 1. Descriptive statistics of key indicators (pre-pandemic vs. post-pandemic)

Indicator	Pre-Pandemic (2018-2019)	Post-Pandemic (2020-2022)	Change (%)
New Business Registrations (per 1,000 people)	12.5	8.1	-35.2%
Self-Employment Rate (%)	14.3	12.6	-11.9%
SME Survival Rate (%)	85.6	74.2	-13.4%
GDP Growth (%)	3.2	-1.1	-134.4%
Unemployment Rate (%)	7.1	10.3	+45.1%
Inflation Rate (%)	4.8	6.4	+33.3%
Investment-to-GDP Ratio (%)	20.4	15.2	-25.5%

The data highlights significant contractions in entrepreneurial activities, including declines in new business registrations, a reduction in self-employment, and a noticeable drop in SME survival rates. These changes are accompanied by a marked slowdown in economic growth, with negative GDP growth and a sharp increase in unemployment rates. The inflation rate also saw an increase, suggesting economic instability during the pandemic.

The most notable observation from the descriptive statistics is the sharp decline in entrepreneurial activities, particularly in terms of new business registrations and SME survival rates. These trends suggest that the pandemic had a severe immediate effect on entrepreneurship, driven by factors such as lockdowns, travel restrictions, supply chain disruptions, and decreased consumer demand. The contraction in entrepreneurial activity was consistent across most emerging markets, although the magnitude of the effect varied depending on local conditions, including government policy responses and the pre-existing strength of the entrepreneurial ecosystem.

To isolate the causal impact of the pandemic on entrepreneurship and macroeconomic outcomes, DID approach was employed. The DID model allowed for the comparison of changes in key indicators between the pre- and post-pandemic periods across countries affected by COVID-19 versus those that were less affected, controlling for pre-existing trends.

The DID estimation results for entrepreneurship-related variables are presented in Table 2, showing the estimated treatment effect of the pandemic on new business registrations, investment in startups, and SME survival rates.

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Table 2. DID estimation results for entrepreneurship-related variables

Variable	Estimate (β)	Standard Error	T-Statistic	P
New Business Registrations (per 1,000 persons)	-4.2	1.1	-3.82	0.0001
Startup Investment ($ Billion)	-1.6	0.8	-2.00	0.0450
SME Survival Rate (%)	-12.6	3.5	-3.60	0.0003

The results indicate a significant negative impact of the COVID-19 pandemic on entrepreneurship. The decline in new business registrations is particularly pronounced, with a drop of 4.2 registrations per 1,000 people, which is statistically significant at the 1% level. Startup investments also experienced a marked reduction, with a $1.6 billion decline in investment, highlighting the challenges faced by entrepreneurs in securing capital during the crisis. The survival rate of SMEs, a key indicator of entrepreneurial resilience, dropped by 12.6%, indicating that many businesses were unable to weather the economic storm.

The DID results for macroeconomic outcomes, including GDP growth, unemployment, and inflation, are shown in Table 3.

Table 3. DID estimation results

Variable	Estimate (β)	Standard Error	T-Statistic	P
GDP Growth (%)	-4.2	1.5	-2.80	0.005
Unemployment Rate (%)	+3.2	1.1	+2.91	0.004
Inflation Rate (%)	+1.6	0.7	+2.29	0.022

The negative effect on economic growth is evident, with GDP growth declining by 4.2 percentage points on average in the post-pandemic period. Unemployment rates increased significantly, by 3.2 percentage points, which underscores the challenges faced by labor markets during the pandemic. Inflation also rose, likely due to disruptions in supply chains and increased government spending, which had inflationary effects.

While the pandemic had widespread impacts on entrepreneurship and macroeconomic performance, the severity of the effects varied significantly across countries. These variations can be attributed to differences in government policy responses, institutional quality, and economic resilience. Table 4 presents a comparison of the DID estimation results for countries with strong versus weak policy responses.

Table 4. Cross-country differences in response to the pandemic

Country Group	New Business Registrations	Startup Investment	SME Survival Rate	GDP Growth	Unemployment Rate	Inflation Rate
Countries with Strong Policy Responses	-2.5	-0.8	-8.3	-2.1	+1.1	+1.2
Countries with Weak Policy Responses	-5.6	-2.3	-15.9	-6.2	+5.4	+2.3

Countries with strong policy responses—such as fiscal stimulus packages, regulatory adjustments, and digital infrastructure investments—experienced less severe declines in entrepreneurial activity and economic performance compared to those with weaker policy frameworks. In countries with weak policy responses, the drop in new business registrations and SME survival rates was

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more pronounced, and economic recovery was slower.

The role of government policy interventions in shaping entrepreneurial outcomes during the pandemic cannot be overstated. Table 5 summarizes the impact of fiscal stimulus, subsidies, and regulatory changes on entrepreneurship in countries with different policy responses.

Table 5. Impact of government policy interventions

Policy Intervention	Estimate (β)	Standard Error	T-Statistic	P
Fiscal Stimulus Packages	+3.1	0.9	+3.44	0.0004
Subsidies and Tax Exemptions	+2.6	1.1	+2.36	0.0190
Regulatory Adjustments (e.g., Remote Work)	+1.9	0.8	+2.38	0.0180

Government fiscal stimulus packages, subsidies, and regulatory adjustments have proven to be effective in mitigating some of the negative impacts of the pandemic on entrepreneurship. The results showed that fiscal stimulus had the largest positive effect, with a significant increase in new business registrations and SME survival rates in countries that implemented robust stimulus packages. Subsidies and tax exemptions also played a crucial role, although their effect was somewhat less pronounced.

The pandemic effect on entrepreneurship also varied across sectors. As shown in Table 6, tech industries and essential sectors exhibited more resilience, while non-essential industries faced sharper declines.

Table 6. Sectoral impact of the COVID-19 pandemic

Sector	Change in New Business Registrations (%)	Change in Investment (%)	Change in SME Survival (%)
Technology	-1.3	-0.5	-5.2
Essential Industries (e.g., healthcare, food)	-2.1	-0.8	-7.5
Non-Essential Industries (e.g., hospitality, retail)	-6.7	-3.0	-20.4

Table 6 provides a comparative look at how different sectors were affected by the pandemic in terms of new business registrations, investment, and survival rates of SMEs. The data indicated that the technology sector was relatively resilient during the pandemic, with a smaller decline in new business registrations and investment in startups compared to other sectors. This can be attributed to the accelerated digital transformation and increasing demand for technology-driven solutions such as e-commerce, remote work tools, and digital health services. Conversely, non-essential industries, such as hospitality and retail, suffered more significant setbacks due to lockdowns, decreased consumer demand, and supply chain disruptions. Essential industries, while also affected, exhibited a lower level of contraction due to the critical nature of their services.

Discussion

This section synthesizes the findings from the empirical analysis and offers insights into the broader implications of the COVID-19 pandemic on entrepreneurship and macroeconomic outcomes in emerging markets. The results showed, the relationships between entrepreneurial activity and economic performance during a crisis, with a particular focus on the mediating role of government interventions, digital infrastructure, and policy responsiveness. The discussion also compares the experiences of emerging markets across different income levels and institutional contexts, highlighting variations in resilience and long-term consequences of the pandemic for

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entrepreneurial ecosystems.

Interpretation of Empirical Results

The findings underscored the significant and multifaceted impact of the COVID-19 pandemic on entrepreneurship and macroeconomic performance in emerging markets. As expected, the pandemic resulted in immediate declines in entrepreneurial activity, particularly in sectors that were most vulnerable to health restrictions, such as hospitality, tourism, and non-essential retail. New business registrations, investment levels, and SME survival rates plummeted during the early stages of the crisis, reflecting the disruption caused by government-imposed lockdowns, travel restrictions, and heightened economic uncertainty.

These results align with previous studies that emphasized the negative effects of crises on entrepreneurial activity (34; 3). The shock to entrepreneurship, however, was not uniform across all countries or sectors. The presence of government support, digital infrastructure, and market flexibility were critical mediating factors that either mitigated or exacerbated the crisis effects on entrepreneurship. In countries with robust fiscal stimulus packages, subsidies, and access to digital platforms, the decline in entrepreneurial activity was less severe. Conversely, nations with weaker institutional frameworks or delayed policy responses faced more pronounced downturns, further highlighting the importance of government intervention during economic crises.

The analysis also revealed that the pandemic had a pronounced effect on the macroeconomic indicators, particularly GDP growth and unemployment. The contraction in entrepreneurial activity, especially among startups, translated into lower investment levels, reduced innovation, and fewer job opportunities, contributing to a slowdown in economic recovery. The negative impact on GDP growth and the sharp increase in unemployment rates observed in many emerging markets are consistent with findings from other global crises (15). In this context, entrepreneurship is not just an indicator of economic vitality but a key driver of recovery, especially in the aftermath of a shock like COVID-19.

The results also pointed to a complex interplay between entrepreneurial activity and macroeconomic outcomes. While a decline in entrepreneurship can lead to negative outcomes in terms of employment and growth, the presence of mitigating factors such as government interventions and digital transformation can offset some of these adverse effects. These findings highlight the need for policymakers to prioritize both short-term relief measures and long-term investments in digital infrastructure and innovation ecosystems to foster resilience in the entrepreneurial sector.

Comparisons Across Emerging Markets

The results also demonstrated significant variations in the pandemic impact on entrepreneurship and economic outcomes across different emerging markets. These differences can be attributed to several factors, including income levels, industrial structure, and institutional quality. Lower-income countries, particularly those with a heavy reliance on informal sectors and limited access to digital platforms, experienced more pronounced declines in entrepreneurial activity. In these countries, entrepreneurs were more likely to face challenges related to liquidity, limited access to government support, and the inability to shift to digital business models (35-36).

In contrast, higher-income emerging markets, which tend to have more diversified economies and better access to digital infrastructure, demonstrated more resilience. For example, the technology and e-commerce sectors saw significant growth in countries like India and Brazil, where government interventions, such as fiscal stimulus packages and subsidies, helped maintain cash flow and ensure business continuity. The availability of online platforms allowed entrepreneurs to pivot their business models, transition to remote services, and tap into new market opportunities.

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Moreover, the industrial structure of a country played a crucial role in shaping the impact of the pandemic. Countries with a higher proportion of industries classified as essential—such as healthcare, agriculture, and logistics—were able to maintain a more stable level of entrepreneurial activity throughout the crisis. In contrast, economies with a higher concentration of non-essential services, such as tourism or hospitality, experienced more severe declines in business registrations, investment, and SME survival rates. This was especially evident in countries with tourism-dependent economies, where businesses were forced to shut down entirely due to border closures and social distancing measures (37).

A key factor that emerged from the analysis was the role of institutional quality in determining resilience. Countries with strong governance structures, efficient public services, and effective crisis management were able to implement more successful policy responses, thereby mitigating the pandemic adverse effects on entrepreneurship. Conversely, countries with weak institutions struggled to provide timely relief, leaving entrepreneurs to fend for themselves during the crisis (38). These findings highlight the importance of governance in shaping the economic resilience of emerging markets, particularly during the crisis.

Long-term vs. short-term effects

The immediate impacts of the COVID-19 pandemic on entrepreneurship have been profound, but the longer-term effects remain uncertain. In the short term, the sharp declines in new business registrations, investment, and SME survival rates signal significant disruptions to the entrepreneurial ecosystem. However, as the pandemic-induced shock fades and economies begin to reopen, the medium- and long-term recovery prospects for entrepreneurship could unfold in various ways.

One key consideration is the potential for structural changes in the entrepreneurial ecosystem. The pandemic has accelerated certain trends, such as the digitization of businesses, the rise of remote work, and the increased reliance on e-commerce platforms. These changes may lead to permanent shifts in how entrepreneurship is conducted in emerging markets, with a greater emphasis on digital transformation and innovation-driven growth. Countries that have invested in digital infrastructure and have a strong entrepreneurial culture may emerge from the crisis more resilient and better equipped to compete in the global digital economy (15).

On the other hand, some entrepreneurs, particularly those in traditional or brick-and-mortar sectors, may face long-term challenges in adapting to new business models. While government support in the form of fiscal stimulus and subsidies has provided temporary relief, the ongoing structural changes in consumer behavior and market dynamics may leave some businesses unable to recover fully. These businesses may either need to pivot to new sectors or close their doors entirely, further contributing to unemployment and economic instability.

In the longer term, entrepreneurship in emerging markets could benefit from the crisis if governments and institutions invest in building more resilient ecosystems. This would involve enhancing access to finance, improving the regulatory environment, and supporting the growth of digital and innovative industries. The post-pandemic period could offer opportunities for entrepreneurship to thrive in new sectors and markets, provided that policymakers take proactive steps to create a supportive environment for business creation and growth.

Lessons for future crises

The COVID-19 pandemic has provided valuable lessons for managing future crises and mitigating their effects on entrepreneurship. First and foremost, the results of this study underscored the critical importance of government intervention in supporting entrepreneurs during the economic shock. Fiscal stimulus, subsidies, and targeted support packages have proven to be essential tools for helping businesses weather the immediate crisis and maintain operations. Countries that acted

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quickly and decisively to provide financial relief to entrepreneurs were able to limit the damage to their economies and preserve jobs (39).

Additionally, the crisis has highlighted the importance of building resilient entrepreneurial ecosystems that are capable of withstanding external shocks. This includes investing in digital infrastructure, fostering innovation, and promoting a culture of entrepreneurship. Digitalization has proven to be a key factor for business continuity during the pandemic, allowing many businesses to pivot to online models and access new customer segments. As such, future policy efforts should focus on expanding access to technology and digital tools for entrepreneurs, especially in emerging markets where digital infrastructure is still in its nascent stages.

Lastly, the pandemic has demonstrated the value of economic diversification for enhancing resilience. Emerging markets with more diversified economies were better able to weather the storm, as they were less reliant on any single sector or industry. Policymakers should therefore prioritize strategies for diversifying the economy, particularly in sectors such as technology, healthcare, and green industries, which are likely to see long-term growth.

The COVID-19 pandemic has had a profound impact on entrepreneurship in emerging markets, with both short-term disruptions and potential long-term changes. While government support, digitalization, and economic policy played crucial roles in shaping resilience, the crisis also revealed deep structural weaknesses in some markets. The lessons learned from this experience should inform future policy responses, with a focus on building more resilient and diversified entrepreneurial ecosystems that can withstand future shocks and drive sustainable economic growth.

Conclusion

This study analyzed the COVID-19 pandemic impact on entrepreneurship and macroeconomic performance in emerging markets using the DID approach. Key findings revealed severe disruptions, including business closures and reduced investment, but emphasized the mitigating role of government intervention (e.g., fiscal stimulus) and digitalization in stabilizing economies and fostering recovery. Emerging markets faced disproportionate effects, with resilience tied to factors like income levels, industrial structure, and institutional quality. Countries with robust policies (e.g., fiscal support, digital infrastructure investment) maintained entrepreneurial activity better, while those lacking such mechanisms experienced higher unemployment and slower recovery.

The research contributed to literature by focusing on emerging markets, often underrepresented in crisis studies, and underscored how digital transformation enabled businesses to adapt, highlighting the need for policies supporting digital innovation. It also examined how institutional strength and economic diversity shape entrepreneurial resilience.

The study limitations included data gaps in measuring entrepreneurial activity in emerging markets and a focus on short-term impacts, with less attention to long-term recovery. Future research could use granular, sector-specific data, and extended timelines to explore medium- to long-term effects. Overall, the study offered insights for policymakers to strengthen SME support and digital infrastructure in crises.

Ethical Consideration

This study utilized secondary, anonymized macroeconomic and entrepreneurial datasets, which do not involve human or animal subjects. Ethical approval was not required as the research adheres to publicly available data and followed institutional guidelines for data confidentiality and integrity.

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Conflict of Interests

The authors declare no financial, personal, or professional conflicts of interest that could affect the findings or interpretations presented in this study.

Authors' Contributions

M. GR, M. MK, V. O, designed research; M. MK, conducted it; M. MK and V. O analyzed data; and M. GR and M. MK wrote the manuscript. All authors read and approved the final manuscript.

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