Fiscal Intervention and MSME Growth Performance: The Mediating Role of Business Model Innovation during COVID-19 in Ghana.

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Abstract

This study examines the relationship between fiscal interventions and micro, small, and medium enterprise (MSME) growth performance in Ghana during COVID-19, with particular emphasis on the mediating role of business model innovation (BMI). Using cross-sectional data from 305 MSMEs in Kumasi Metropolis, we employed a three-model structural equation approach to test relationships among fiscal stimulus, BMI, and enterprise performance. Contrary to theoretical expectations, the findings revealed a consistent and statistically significant negative relationship between fiscal stimulus interventions and enterprise performance across all model specifications. No significant mediation effect was observed through business model innovation pathways, suggesting that fiscal support mechanisms failed to promote strategic transformations necessary for sustainable competitive advantage. Interestingly, the study uncovered evidence of performance-driven innovation patterns, where successful enterprises demonstrated greater propensity for revenue model adaptations, indicating reactive rather than proactive innovation behavior. These counterintuitive findings challenge conventional assumptions about fiscal policy effectiveness in emerging economies and suggest that COVID-19 support mechanisms may have inadvertently created dependency relationships or misaligned incentives that hindered rather than enhanced enterprise growth. The results further highlighted the need for capability-centered policy designs that emphasize strategic guidance and performance-linked incentives over unconditional financial transfers in MSME development programs.

Key words: *fiscal interventions, business model innovation, MSME performance, COVID 19 and structural equation modeling.*

1.0 INTRODUCTION

Keynesian doctrines postulate that fiscal stimulus is conventionally understood as a countercyclical policy instrument through which governments intervene to stabilize aggregate demand, sustain productive activity, and avert prolonged economic downturns during periods of systemic shocks. In the context of the COVID-19 pandemic, such interventions were rapidly deployed by many countries to preserve firm continuity and employment, particularly among micro, small, and medium enterprises (MSMEs) that were structurally vulnerable to liquidity constraints and demand collapse (Hinterlang et al., 2023; Mtotywa & Mdletshe, 2025; Safitri et al., 2021). However, while Keynesian models emphasize the expansionary effects of fiscal spending on output and growth, they remain largely silent on the **micro-level transmission mechanisms** through which fiscal support translates into firm performance under conditions of extreme uncertainty (Gechert, 2023).

It has been established that the COVID-19 pandemic disrupted global trade and economic activity

on an unprecedented scale, exposing critical vulnerabilities in interconnected markets (Guan et al., 2020; Panwar et al., 2022; Xu et al., 2020). As the virus spread rapidly worldwide, global supply chains faced severe disruptions and productivity declined sharply due to the disease's mounting lethality and containment measures. Sub-Saharan African economies confronted a particularly acute dual challenge: healthcare systems threatened by potentially overwhelming case loads and severe economic consequences affecting both productivity and livelihoods (Okoi & Bwawa, 2020; Teachout & Zipfel, 2020). The pandemic's global scope constrained access to international aid precisely when it was most needed, creating a convergence of overburdened health systems and deteriorating economic conditions that posed existential threats to these vulnerable economies (Adam et al., 2020).

In Ghana, the pandemic severely impacted an economy dominated by MSMEs (Arthur & Arthur, 2024). These enterprises—typically defined as entities with fewer than 10 employees (Donkor et al., 2018)—were characterized by limited capitalization and heightened vulnerability to external shocks. COVID-19 imposed significant operational burdens through reduced sales volumes, supply chain disruptions, and unplanned labour turnover, ultimately threatening livelihood security and household welfare (Adom et al., 2020; Avenyo et al., 2020; Ivanov & Das, 2020). To mitigate these market uncertainties and their cascading effects, the government implemented comprehensive fiscal interventions designed to cushion enterprises from pandemic-related disruptions. These interventions encompassed utility subsidies, tax relief measures, and direct financial support through flexible loan schemes specifically targeting MSMEs (Akrofi & Antwi, 2020).

Following the implementation of government fiscal stimulus packages, a growing body of literature has documented the short-term impacts of these interventions on enterprise performance (Antwi-Boasiako et al., 2021; Boakye et al., 2020; Li et al., 2021). While these studies provide valuable insights, they have predominantly examined conventional growth metrics such as revenue performance and employment retention, leaving critical dimensions of enterprise transformation underexplored. Notably absent from this literature is systematic analysis of how fiscal interventions influenced deeper structural adaptations - particularly business model innovation (BMI). Given that adaptive and innovative business models are increasingly recognized as fundamental drivers of firm resilience and long-term competitiveness in volatile environments (Akpan et al., 2021; Breier et al., 2021), this gap represents a significant limitation in our understanding of pandemic response effectiveness. Moreover, limited empirical evidence exists regarding whether fiscal stimulus effects translated into business model innovation among MSMEs, and whether such innovation served as a mediating mechanism for observed growth outcomes. This study addresses these critical knowledge gaps by examining both direct and indirect pathways through which fiscal stimulus influenced enterprise growth, with particular emphasis on the transformative role of business model innovation within Ghana's MSME sector.

Business models encompass the comprehensive framework through which firms create, deliver, and capture value for clients while ensuring organizational sustainability through strategic resource allocation and management processes (Trimi & Berbegal-Mirabent, 2012). Business model innovation (BMI) represents the deliberate reconfiguration of these foundational elements to enhance competitive positioning through strategic adjustments to value propositions, operational processes, and cost structures in response to evolving market conditions (Clauss et al., 2021). This innovation process fundamentally concerns how enterprises can identify and exploit new opportunities to enhance profitability and long-term viability. For MSMEs operating in uncertain

environments, business model innovation becomes particularly critical as these enterprises must strategically modify their operational frameworks to optimize transaction costs and revenue generation mechanisms for survival and growth (Ferlito & Faraci, 2022).

This study examines the relationship between fiscal interventions targeting MSMEs and their subsequent growth performance, with specific focus on the mediating mechanisms of business model innovation. Four interconnected objectives guide the empirical analysis and theoretical contributions. First, we assess the direct impact of fiscal stimulus interventions on MSME growth performance in Ghana, establishing baseline evidence of the policy support-enterprise outcome relationship. Second, we examine BMI's mediating role in the fiscal stimulus-growth relationship using first-order structural equation modeling to capture immediate innovation-performance pathways. Third, we investigate hierarchical mediation effects within a second-order structural framework, enabling nuanced analysis of how multidimensional innovation aspects contribute to firm growth. Finally, we isolate and evaluate the most influential BMI indicators to determine their specific mediating effects within the stimulus-growth nexus. These objectives collectively provide a comprehensive analytical framework for understanding both direct intervention effects and the underlying innovation mechanisms driving enterprise growth during crisis periods.

This study advances the literature on enterprise development and crisis-period policy responses through several key contributions. It extends empirical understanding of how targeted government fiscal interventions influence MSME growth by systematically examining BMI's mediating role in this relationship. By deconstructing the transmission mechanisms through which fiscal support translates into firm-level outcomes, the research provides evidence-based insights for designing and targeting future intervention programs. This will contribute to policy discourse on optimizing stimulus package effectiveness for MSME resilience and performance enhancement. Theoretically, the study deepens engagement with how MSMEs navigate uncertainty through adaptive business model strategies, illuminating their dynamic capabilities in volatile market environments. The findings reveal the relative agility of small enterprises in departing from conventional operational models to embrace innovation when confronting external shocks, offering valuable implications for both policy formulation and enterprise-level resilience planning strategies.

Theoretical foundations of fiscal policy response

The appropriate policy response to economic downturns has generated sustained theoretical debate within economics literature, with fundamental disagreements persisting from the Great Depression through the COVID-19 era (Rowthorn, 2020). This debate centers on whether government intervention through fiscal intervention can effectively stimulate aggregate demand and output, or whether such measures create market distortions that ultimately undermine long-term economic growth (Djuraskovic et al., 2018). The COVID-19 pandemic has reinvigorated these theoretical discussions as governments worldwide implemented unprecedented fiscal packages to mitigate severe economic disruptions caused by the global health crisis (Almeida et al., 2020; Benmelech & Tzur-Ilan, 2020; Prante et al., 2020).

The theoretical divide reflects fundamentally different assumptions about market efficiency and adjustment mechanisms. Classical and New Classical economists maintain that fiscal activism is largely ineffective or counterproductive, arguing that flexible prices and wages enable markets to self-correct through rational economic agent behavior. From this perspective, government spending creates crowding-out effects on private investment while fueling inflationary pressures that distort

optimal resource allocation (Djuraskovic et al., 2018). Conversely, Keynesian economists argue that fiscal policy is essential during crisis periods to restore aggregate demand and economic stability, given the prevalence of nominal rigidities and price stickiness in both goods and labor markets (Eichengreen, 2020). This school contends that market forces alone are insufficient to close output gaps or address persistent unemployment without government intervention. The COVID-19 crisis provides a particularly compelling context for re-examining these theoretical foundations and their real-world implications. In most special interest is how fiscal interventions can affect firm-level dynamics and structural transformations in emerging economies, where market imperfections may be more pronounced.

Business model innovation

Business models fundamentally explain how enterprises create and capture value for their clientele while ensuring sustainable organizational existence through these value-creation processes (Björkdahl et al., 2022). This conceptualization encompasses the comprehensive representation of value proposition elements—including creation, delivery, and capture mechanisms—and their interactive dynamics within organizational structures (Geissdoerfer et al., 2018). The business model concept centers on value creation by enterprises and its delivery to customers to fulfill transactional objectives through utility maximization and profit optimization for both parties (Ilyas & Osiyevskyy, 2021).

Business model innovation represents the strategic introduction of new processes and concepts into existing value creation and delivery systems (Björkdahl et al., 2022). While introducing novel processes to established operational frameworks creates inherent risks, it simultaneously enhances the enterprise's entire value chain and market opportunity set (Snihur et al., 2021). The critical trade-off between innovation risks and market opportunities requires careful strategic consideration to maximize enterprise gains and competitive positioning.

BMI assumes particular importance during periods of market instability, potentially providing escape routes for companies facing severe market disruptions (Lindgardt et al., 2009). Enterprises can reinvent their product offering logic, potentially improving cost structures while aligning value propositions with customers' evolving economic and social circumstances. Empirical evidence suggests that BMI has served as a source of increased returns for companies globally, enhancing their value offerings to customers (Euchner & Ganguly, 2014).

The operationalization of BMI can follow multiple pathways to achieve intended outcomes, though these processes are acknowledged to be difficult, costly, and uncertain (Björkdahl et al., 2022). The innovation process typically begins with information and technology searches that could positively impact existing production logic. Two primary search mechanisms have been identified: forward-looking (cognitive) search, which involves envisioning potential actions and their production logic implications. Secondly, backward-looking experiential search, which builds on enterprise experiences from past successes or learns from previous failures.

Despite substantial attention in the literature, BMI suffers from limited robust theoretical foundations that would provide comprehensive frameworks for analyzing its relationships with other variables (Carayannis et al., 2014). This theoretical underdevelopment has contributed to limited consensus regarding BMI's relationship with key indicators such as enterprise performance and broader economic outcomes (ANWAR, 2018; Lambert & Davidson, 2013; Pucihar et al., 2019). However, rather than addressing these foundational theoretical limitations, this study focuses specifically

on how MSMEs applied BMI principles to navigate the COVID-19 pandemic's impact on business operations, contributing to our empirical understanding of innovation-mediated crisis response mechanisms.

Fiscal interventions and MSME performance during economic crises

Empirical evidence on the effectiveness of fiscal stimulus packages in supporting SME performance has accumulated substantially, particularly following major economic disruptions. Fiscal stimulus measures typically encompass diverse policy instruments including direct transfer payments, tax reductions, and targeted subsidies designed to counteract economic downturns (Steel & Harris, 2020). The global financial crisis of 2007-2009 provided crucial empirical insights into fiscal policy effectiveness, with subsequent research demonstrating significant positive impacts on economic recovery and renewed scholarly interest in fiscal interventions as crisis response mechanisms.

Pre-pandemic empirical investigations established important precedents for understanding firm-level responses to fiscal policy during economic disruptions. Chibi et al. (2019) employed a Markov Switching Vector Autoregressive (MSVAR) model to examine fiscal policy effectiveness within Algeria's business cycle fluctuations, concluding that fiscal interventions were particularly impactful during recessionary periods and instrumental in transitioning the economy from decline to sustained growth. This finding aligns with broader empirical evidence supporting counter-cyclical fiscal policy effectiveness in emerging economies.

The COVID-19 pandemic has generated substantial new empirical evidence on fiscal stimulus effectiveness for SME support. In Ghana, comprehensive stimulus packages designed for pandemic response enabled the majority of SMEs to navigate operational challenges while maintaining performance levels above critical thresholds (Antwi-Boasiako et al., 2021). Dzigbede and Pathak (2020) provided supporting evidence that targeted fiscal interventions in critical economic sectors, particularly the SME segment, effectively revitalized business operations while catalyzing broader economic recovery from pandemic-induced disruptions. Similarly, Malaysian evidence demonstrates that government stimulus packages significantly enhanced SME recovery trajectories from pandemic-related negative effects (Lim et al., 2021).

Business model innovation and firm performance

The empirical relationship between business model innovation and firm performance presents mixed findings across different contexts and methodological approaches. Latifi et al. (2021) examined this relationship using a cross-sectional sample of 563 European firms, arguing that BMI introduces significant operational risks and uncertainties through fundamental changes to underlying production principles. Their analysis revealed no significant relationship between BMI and business performance, suggesting that innovation-related disruptions may offset potential benefits in certain contexts.

Conversely, substantial empirical evidence supports positive BMI-performance relationships. ANWAR (2018) established a significant positive direct relationship between BMI and SME performance using data from 303 Pakistani manufacturing SMEs. The study concluded that enterprises must develop competitive business models through systematic innovation to enhance performance in increasingly competitive markets. This finding received support from Hamelink and Opdenakker (2019), who confirmed positive BMI impacts on enterprise performance within the energy sector, suggesting sector-specific variations in innovation effectiveness.

The measurement of business performance in BMI research remains methodologically diverse, with ANWAR (2018) noting the absence of universally accepted performance definitions and advocating for context-appropriate measurement standards that align with specific research objectives and sectoral characteristics.

Fiscal stimulus and business model innovation

Empirical investigation of fiscal interventions' effects on business model innovation remains limited, though emerging evidence suggests important linkages between policy support and organizational transformation processes. Casado et al. (2020) emphasized the critical importance of assessing fiscal intervention effects on intended transformation outcomes within production entities. This assessment became particularly relevant given the dominance of COVID-19 in shaping global fiscal policy responses and the consequent need to measure policy impacts on economic transformation.

Ghana's substantial fiscal support for private companies aimed at operational revitalization and economic stimulation provides a relevant empirical context. However, data availability constraints have limited comprehensive policy effect measurement. Broader empirical evidence demonstrates that fiscal investments in innovation through research and development funding contribute significantly to economic growth outcomes (Deleidi et al., 2019). Given that innovation represents a cost burden for private investment, empirical studies suggest that fiscal incentives through tax subsidies are crucial for driving sustainable corporate research and development expenditure (Kaveski et al., 2020).

The mediating role of business model innovation

Empirical examination of BMI's mediating effects between fiscal stimulus and performance outcomes represents an emerging research area with limited but growing evidence base. While BMI mediation studies remain relatively uncommon in business literature, several key investigations have established important precedents (Al-Nimer et al., 2021; Ferreras-Méndez et al., 2021; Guo et al., 2017). Mediation analysis requires demonstrating that BMI explains significant portions of relationships between predictor and outcome variables by serving as a transmission mechanism through which indirect effects operate (Memonq et al., 2018).

Ferreras-Méndez et al. (2021) investigated BMI's mediating role in the relationship between entrepreneurial orientation and new product development using data from 400 Spanish SMEs. Their analysis revealed partial mediation effects, indicating that BMI explains significant but incomplete portions of the entrepreneurial orientation-performance relationship. Guo et al. (2017) provided complementary evidence demonstrating that market opportunity recognition requires translation through strategic BMI initiatives to achieve positive performance outcomes. Their findings suggest significant positive mediation effects between opportunity recognition and business performance.

Most notably, Al-Nimer et al. (2021) established complete mediation effects of BMI in the relationship between enterprise risk management and business performance using data from 228 Jordanian firms. This finding suggests that BMI can serve as a critical transmission mechanism through which organizational capabilities translate into performance outcomes.

2.0 METHODOLOGY

2.1 Research design and philosophical framework

This study employs a cross-sectional research design situated within a quantitative methodology to examine the relationship between fiscal interventions and enterprise-level growth dynamics among MSMEs. The cross-sectional approach was selected for its capacity to capture relationships between variables at a specific point in time, providing insights into the immediate effects of fiscal interventions on business model innovation and performance outcomes following the COVID-19 pandemic. This design aligns with the study's objective to understand contemporary enterprise responses to fiscal policy interventions rather than longitudinal developmental patterns.

The quantitative approach enables systematic measurement and statistical analysis of the hypothesized relationships between fiscal stimulus, business model innovation, and enterprise performance, facilitating the testing of mediation effects through structural equation modeling techniques. This methodological choice supports the study's emphasis on establishing empirical evidence regarding policy effectiveness and innovation-mediated growth mechanisms.

2.2 Study context and geographic setting

The research was conducted in the Kumasi Metropolis, Ghana's second-largest urban center and the administrative capital of the Ashanti Region. Kumasi represents a strategically important research context due to its role as a major commercial and cultural hub within Ghana's urban hierarchy, characterized by rapid spatial expansion and dynamic economic growth. With an estimated population exceeding two million and an annual growth rate of approximately 5.4 percent, the Metropolis exemplifies the economic vibrancy and structural challenges typical of emerging economy urban centers.

The selection of Kumasi as the study locale is theoretically justified by several factors. First, the Metropolis hosts a diverse ecosystem of micro, small, and medium enterprises operating across multiple sectors, providing adequate heterogeneity for empirical analysis. Second, its position as a regional commercial center ensures exposure to both formal and informal economic activities, enabling examination of fiscal intervention effects across different enterprise types. Third, the city's economic significance within Ghana's national framework makes it a relevant context for policy analysis with broader applicability.

Commercial activity in Kumasi is highly concentrated within the Central Business District (CBD), which encompasses critical commercial infrastructures including the Kejetia Lorry Terminal, the Kumasi Central Market—recognized as one of West Africa's largest open-air markets—and the Adum Shopping Complex. These locations constitute the economic nucleus of the Metropolis and serve as vital convergence points for diverse enterprise types, from traditional trading activities to modern service-oriented businesses. This geographic concentration facilitates comprehensive data collection while ensuring representation of the full spectrum of MSME activities.

2.3 Population and sampling framework

The target population comprised MSMEs officially registered with the Kumasi Metropolitan Assembly (KMA), representing the universe of formally recognized small-scale enterprises within the study area. Official registration with the KMA was adopted as the inclusion criterion to ensure

data quality and enterprise legitimacy while maintaining focus on businesses likely to have been eligible for government fiscal interventions during the pandemic period.

The sampling frame was constructed from the KMA's comprehensive enterprise registry, a database maintained for municipal revenue planning and mobilization purposes. At the time of data collection, this registry contained 1,094 registered enterprises, classified according to traditional communities and administrative sub-districts within the Metropolitan area. This classification system provided a natural stratification mechanism that enabled the study to capture both geographical and sectoral heterogeneity among MSMEs operating in Kumasi.

The stratified sampling approach offers several methodological advantages. First, it ensures proportional representation across different geographic zones within the Metropolis, accounting for potential spatial variations in enterprise characteristics and policy exposure. Second, the stratification enhances statistical efficiency by reducing sampling variance compared to simple random sampling. Third, this approach enables subgroup analysis if required while maintaining overall sample representativeness. The geographical stratification is particularly important given Kumasi's diverse economic landscape, ranging from traditional market-based activities in the CBD to emerging service sectors in peripheral areas.

This sampling framework enhances the robustness and external validity of the empirical analysis by ensuring that the sample adequately reflects the broader population of MSMEs in the study area, thereby supporting meaningful generalization of findings to similar urban contexts in Ghana and comparable emerging economies.

2.4 Sample size determination and selection procedures

A probability-based sampling strategy was implemented using stratified random sampling to ensure representativeness across diverse traditional community clusters within the Kumasi Metropolis. The sampling frame utilized the comprehensive KMA enterprise registry containing 1,094 MSMEs officially recorded for annual business operating permit assessment purposes. This registry provided essential identifying information including enterprise names, geographic locations, operational communities, and business owner contact details, facilitating reliable stratification procedures.

Given the finite population characteristics, sample size determination employed the normal approximation to the hypergeometric distribution, which is statistically appropriate for small population contexts. The following formula was applied:

$$n = \frac{NZ^2pq}{E^2\ (N-1) + Z^2\ pq}$$

Where *n* represents the required sample size, *N* the population size (1,094), *Z* the confidence level coefficient (1.96 for 95% confidence), *p* and *q* the population proportions (0.5 each for maximum variability), and *E* the desired margin of error (0.04). Applying these parameters:

$$= \frac{(1094)(1.96)^2(0.5x0.5)}{0.04^2\ (1093) + 1.96^2\ 0.5x0.5} = 388$$

This calculation yielded a statistically sufficient sample of 388 enterprises, ensuring 95% confidence level with a 4% margin of error. The sample size provides adequate statistical power for the proposed

structural equation modeling analysis while maintaining practical feasibility for data collection procedures.

Enterprises were randomly selected within each stratum (community cluster) using systematic random sampling to ensure proportional representation across the Metropolis. This stratified approach enhances both internal validity through reduced sampling variance and external validity through comprehensive geographic representation, thereby strengthening the generalizability of empirical findings to similar urban MSME contexts.

2.5 Data collection instrument

Data collection employed a structured questionnaire developed specifically for this study. The study achieved a response rate of 78.6% (305 out of 388 targeted enterprises), which aligns with minimum threshold for statistical analysis in SEM studies (Wang & Rhemtulla, 2020). The instrument underwent rigorous ethical review and received formal approval from the Ethical Clearance Committee of Kumasi Technical University, ensuring compliance with both institutional and international research ethics protocols. The questionnaire design prioritized construct validity, reliability, and cultural appropriateness for the Ghanaian MSME context.

The instrument was structured to capture five core variable categories central to the study's theoretical framework: enterprise characteristics, ownership demographic attributes, enterprise performance, fiscal stimulus intervention exposure, and business model innovation manifestations. These constructs were operationalized as latent variables, each measured through multiple observable indicators derived from established literature and contextually adapted for the study setting.

2.6 Variable operationalization and measurement

BMI was measured using five indicators designed on a four-point Likert scale ranging from "strongly agree" to "strongly disagree." The indicators captured key dimensions of pandemic-induced business model adaptations:

i. Equipment and investment: "The situation during COVID-19 compelled you to acquire new equipment/systems that previously had not been considered"

ii. Payment system innovation: "The effects of COVID-19 on the market made you change your payment methods from direct cash to digital systems like mobile money"

iii. Product/service redesign: "COVID-19 compelled you to redesign the packaging of products/services offered to the market"

iv. Delivery system transformation: "COVID-19 made you change your delivery system from personal contact to courier-based systems"

These indicators comprehensively captured the multidimensional nature of BMI as conceptualized in the theoretical framework, encompassing value creation, delivery, and capture modifications in response to pandemic-induced market changes.

Enterprise Performance was measured using a sole indicator of profitability based on the same four-point Likert scale format. Profitability changes was measured by the item, "Since COVID-19, your business profit has increased"

Fiscal stimulus exposure was captured through binary and scaled measures indicating:

i. Support types: Categories of assistance received (subsidies, tax relief, direct financial support)

ii. Support adequacy: "The government support received was adequate for your business needs"

All measurement scales underwent pre-testing with a pilot sample of 30 enterprises to ensure clarity, cultural appropriateness, and construct validity before full-scale data collection implementation.

2.7 Data collection procedures

Data collection was conducted through face-to-face questionnaire administration by trained research personnel from the Centre for Social Science Research at Kumasi Technical University. The field team comprised five research assistants and one field supervisor, all of whom underwent intensive three-day training on questionnaire content, administration protocols, and bilingual delivery in both English and Akan languages. This bilingual capability was essential given the linguistic diversity of the target population and ensured comprehensive accessibility across different educational and cultural backgrounds.

The training program encompassed several critical components: questionnaire content familiarization, standardized administration procedures, ethical data collection protocols, and technical proficiency in KoBoCollect, the electronic data collection and processing software employed for the study. KoBoCollect was selected for its robust data quality features, real-time data validation capabilities, and secure cloud-based storage systems that minimize data loss risks and enhance collection efficiency.

Field data collection involved direct visits to the premises of sampled enterprises, where questionnaires were administered to proprietors or principal managers possessing comprehensive knowledge of enterprise operations and strategic decision-making processes. This approach ensured data quality by targeting respondents with appropriate organizational knowledge and decision-making authority. The field data collection exercise was completed over a three-week period, allowing sufficient time for thorough data gathering while maintaining temporal consistency across the sample.

2.8 Inclusion and exclusion criteria

The study employed specific inclusion and exclusion criteria to ensure sample relevance and data quality. Inclusion criteria required that enterprises: (1) be officially registered with the Kumasi Metropolitan Assembly, (2) have been operational prior to the COVID-19 pandemic onset (before March 2020), (3) fall within the MSME classification parameters, and (4) have proprietors or managers available and willing to participate in the study.

The primary exclusion criterion stipulated that enterprises not operating before the pandemic onset were excluded from enumeration, as these businesses would lack the experiential basis necessary to provide relevant data regarding pandemic-induced changes in business models and performance. This temporal criterion was critical for ensuring that observed changes could be attributed to pandemic responses rather than normal startup activities or market entry processes.

Additional exclusion criteria included: enterprises with incomplete registration documentation, businesses that had permanently ceased operations, and cases where appropriate respondents

(proprietors or principal managers) were unavailable after three contact attempts. These criteria collectively ensured data reliability while maintaining ethical standards for voluntary participation.

2.9 Statistical modeling framework

The analytical approach employed three sequential structural equation models (SEM) to examine the relationships among study variables with increasing levels of complexity and control. This multi-model strategy enables comprehensive examination of the core relationships while systematically accounting for potential confounding factors that might influence the observed associations.

2.10 First-order mediation model

The foundational model specifies a parsimonious first-order mediation framework incorporating three primary constructs: fiscal intervention (independent variable), business model innovation (mediator), and enterprise growth performance (dependent variable). This model treats BMI as a unidimensional latent construct directly measured by observable indicators, testing the core theoretical proposition that BMI mediates the relationship between fiscal stimulus and performance outcomes. The first-order specification provides baseline evidence for the hypothesized mediation mechanism while establishing the fundamental structural relationships among constructs. Mathematically:

Fiscal stimulus construct (ξ_1)

$X_1 = \lambda_{11}\xi_1 + \delta_1$ (Amount of financial support received)

$X_2 = \lambda_{21}\xi_1 + \delta_2$ (Beneficiary status classification)

BMI construct (η_1)

$Y_1 = \lambda_{11}\eta_1 + \varepsilon_1$ (Equipment investment intensity)

$Y_2 = \lambda_{21}\eta_1 + \varepsilon_2$ (Digital transformation initiatives)

$Y_3 = \lambda_{31}\eta_1 + \varepsilon_3$ (Operational redesign activities)

$Y_4 = \lambda_{41}\eta_1 + \varepsilon_4$ (Courier/logistics optimization)

Performance construct (η_2)

$Y_5 = \lambda_{52}\eta_2 + \varepsilon_5$ (Profitability measures)

Structural equations:

Mediator model:

$\eta_1 = \gamma_{11}\xi_1 + \zeta_1$

Outcome model:

$\eta_2 = \gamma_{21}\xi_1 + \beta_{21}\eta_1 + \zeta_2$

Where:

$\boldsymbol{\eta_1}$ = BMI (endogenous latent variable)

$\boldsymbol{\eta_2}$ = Organizational Performance (endogenous latent variable)

ξ_1 = Fiscal Stimulus (exogenous latent variable)

γ_{11} = structural coefficient representing the direct effect of fiscal stimulus on BMI

γ_{21} = structural coefficient representing the direct effect of fiscal stimulus on performance

β_{21} = structural coefficient representing the direct effect of BMI on performance

ζ_1, ζ_2 = structural disturbance terms with $E(\zeta_i) = 0$

2.11 Second-order hierarchical model

The second model introduces theoretical and empirical sophistication through a second-order hierarchical structure for the BMI construct, addressing both theoretical foundations and data complexity limitations. Based on established business model literature, BMI is conceptualized as a higher-order construct comprising three distinct but related dimensions. It starts with value creation, which captures innovations in resource configuration, production processes, and capability development. Also, value delivery, which encompasses changes in customer interface, distribution channels, and service delivery mechanisms. The last is value capture, an action that reflects modifications in revenue models, cost structures, and profit mechanisms.

This hierarchical specification allows the BMI indicators to load onto their respective first-order dimensions (value creation, delivery, and capture), which subsequently load onto the second-order BMI construct. This approach provides a more theoretically grounded and empirically nuanced representation of business model innovation while maintaining parsimony in the overall structural model. The second-order framework enables examination of both the aggregate BMI effect and the differential contributions of specific innovation dimensions.

The second-order hierarchical model conceptualizes BMI as a higher-order construct manifesting through three first-order dimensions: Value Creation (ξ_1), Value Delivery (ξ_2), and Value Capture (ξ_3).

Value Creation Dimension (ξ_1):

$Y_1 = \lambda_{11}\xi_1 + \varepsilon_1$ (Equipment investment)

$Y_2 = \lambda_{21}\xi_1 + \varepsilon_2$ (Digitalization initiatives)

Value Delivery Dimension (ξ_2):

$Y_3 = \lambda_{32}\xi_2 + \varepsilon_3$ (Courier/logistics optimization)

Value Capture Dimension (ξ_3):

$Y_5 = \lambda_{53}\xi_3 + \varepsilon_5$ (Operational redesign)

Fiscal Stimulus (ξ_5) and Performance (η_1) constructs remain as specified in Model 1.

Second-Order Factor Model

The three first-order BMI dimensions are manifestations of the higher-order BMI construct (ξ_4):

$\xi_1 = \gamma_{14}\xi_4 + \zeta_1$ (BMI-value creation effect)

$\xi_2 = \gamma_{24}\xi_4 + \zeta_2$ (BMI-value delivery effect)

$\xi_3 = \gamma_{34}\xi_4 + \zeta_3$ (BMI-value capture effect)

Structural Model

The mediation framework operates through the second-order BMI factor:

$\xi_4 = \beta_1\xi_5 + \zeta_4$ (Stimulus-BMI effect)

$\eta_1 = \beta_2\xi_5 + \beta_3\xi_4 + \zeta_5$ (Stimulus- BMI-performance effect)

Dimension-Specific Mediation:

$Mediation_1 = \beta_1 \times \gamma_{14} \times (\gamma_{14} \times \beta_3)$ (value creation)

$Mediation_2 = \beta_1 \times \gamma_{24} \times (\gamma_{24} \times \beta_3)$ (value delivery)

$Mediation_3 = \beta_1 \times \gamma_{34} \times (\gamma_{34} \times \beta_3)$ (value capture)

2.12 Parsimonious optimal model

The third model represents a trimmed specification that retains only statistically significant pathways and constructs identified through the previous analyses. This parsimonious approach eliminates non-significant variables and pathways to achieve optimal model fit while maintaining theoretical coherence and empirical validity. The trimmed model serves multiple analytical purposes: such as enhancing statistical power through reduced model complexity, improving interpretability by focusing on the most influential relationships, and providing a refined framework for practical policy and managerial implications.

The sequential progression from first-order through second-order to trimmed specifications enables comprehensive examination of the fiscal intervention-BMI-performance relationship while systematically addressing issues of model complexity, theoretical specification, and empirical optimization. This progressive modeling approach enables robust hypothesis testing while systematically controlling for alternative explanations, thereby enhancing the validity of causal inferences regarding the fiscal intervention-BMI-performance relationship. The sequential specification also allows for assessment of model stability and the sensitivity of core findings to the inclusion of control variables.

The trimmed first-order model represents a parsimonious refinement of the original first-order SEM (Model 1), eliminating indicators with weak factor loadings (< 0.50), high cross-loadings, or poor reliability based on modification indices and standardized residuals.

Trimmed measurement model

BMI construct (ξ_1): *Trimmed from 5 to 3 indicators*

$Y_1 = \lambda_{11}\xi_1 + \varepsilon_1$ (Equipment investment)

$Y_2 = \lambda_{21}\xi_1 + \varepsilon_2$ (Digitalization initiatives)

$Y_3 = \lambda_{31}\xi_1 + \varepsilon_3$ (Operational redesign)

Fiscal stimulus construct (ξ_2): *Trimmed from 2 to 1 indicator*

Organizational performance (η_1): Unchanged

$Y_4 = \lambda_{41}\eta_1 + \varepsilon_4$ (Profitability measure)

Trimmed structural model

$\xi_1 = \gamma_{12}\xi_2 + \zeta_1$ (stimulus-BMI effect)

$\eta_1 = \beta_{12}\xi_2 + \beta_{11}\xi_1 + \zeta_2$ (stimulus-BMI-performance effect)

Where:

γ_{12} = effect of fiscal stimulus on BMI (a-path)

β_{12} = direct effect of fiscal stimulus on performance (c'-path)

β_{11} = effect of BMI on performance (b-path)

ζ_1, ζ_2 = structural disturbances

Indirect Effect:

Mediation = $\gamma_{12} \times \beta_{11}$

Total Effect:

Total effect = $\beta_{12} + (\gamma_{12} \times \beta_{11})$

3.0 RESULTS

3.1 Descriptive analysis

The sectoral distribution of participating enterprises reflects Ghana's economic structure, with services sector dominance accounting for 91.5% of the sample (279 enterprises), followed by industry (6.2%, 19 enterprises) and agriculture (2.3%, 7 enterprises). This distribution aligns with national economic patterns where the services sector constitutes the largest component of Ghana's GDP (Asigbetse et al., 2022; Nyamekye et al., 2021).

Table 1: sectoral distribution of participating enterprises

Sector	**Frequency**	**Percentage**
Agriculture	7	2.3%
Industry	19	6.2%
Services	279	91.5%
Total	**305**	**100.0%**

3.2 Enterprise Registration and Formalization Patterns

Analysis of registration status reveals significant insights into the formalization patterns of MSMEs within the study area. Sole proprietorships dominated the sample, accounting for approximately 70% of registered enterprises, indicating the prevalence of individual entrepreneurship over collaborative business structures. Partnership arrangements and limited liability companies were

relatively uncommon, reflecting barriers to formal business association or preferences for individual control. Notably, unregistered enterprises comprised less than 10% of the sample, suggesting higher formalization rates than typically observed in Sub-Saharan African contexts, possibly due to the urban setting and KMA registration requirements.

3.3 Gender composition in enterprise ownership

The gender analysis reveals important patterns in enterprise ownership structures among the 298 valid responses obtained. Male-only ownership characterized 48.0% of enterprises (145 firms), while female-only ownership accounted for 34.1% (103 enterprises). Joint ownership between men and women was observed in only 11.9% of cases (36 enterprises), indicating limited gender collaboration in business ownership. This pattern suggests gender-segmented entrepreneurship with minimal cross-gender partnership formation.

Table 2: Gender Composition of Enterprise Ownership

Ownership Pattern	**Frequency**	**Percentage**
Male-only ownership	145	48.0%
Female-only ownership	103	34.1%
Joint male-female ownership	36	11.9%
Female-majority ownership	8	2.7%
Female group ownership	3	1.0%
Male-majority ownership	2	0.7%
Unknown	1	0.3%
Total	**298**	**100.0%**

3.4 Fiscal stimulus benefit distribution

The analysis of stimulus benefit receipt reveals concerning patterns regarding policy implementation effectiveness. A substantial majority (59.6%, 180 enterprises) reported receiving no benefits under the COVID-19 stimulus package, despite government announcements of universal utility subsidies. Only 30.5% of participants (92 enterprises) reported receiving utility waivers or subsidies, while direct financial support and tax relief had extremely low uptake rates (below 3% each).

Table 3: Distribution of Stimulus Benefits Received

Benefit Type	Frequency	Percentage
No benefits received	180	59.6%
Utility waiver/subsidy	92	30.5%
Tax waiver/holiday	20	6.6%
Multiple benefits	10	3.3%
Direct financial support	8	2.6%

Benefit Type	Frequency	Percentage
Other benefits	8	2.6%
Total	**305**	**100.0%**

This distribution suggests significant implementation gaps, information asymmetries, or eligibility barriers that prevented widespread benefit access, raising questions about policy design and delivery mechanisms.

3.5 First-order model fit analysis

The first-order SEM demonstrated excellent model fit across all standard indices, providing strong evidence for the appropriateness of the theoretical specification. The Chi-square statistic (χ^2 = 26.020, p = 0.099) indicates non-significant discrepancy between the observed and model-implied covariance matrices, suggesting good fit. Incremental fit indices confirmed model adequacy: CFI = 0.983 and TLI = 0.973 (both exceeding the 0.95 threshold for excellent fit). Absolute fit measures further supported model appropriateness: RMSEA = 0.038 (90% CI: [0.000, 0.068]) and SRMR = 0.039, both well within acceptable ranges.

Table 4: Model 1 Goodness-of-fit statistics

Fit index	**Value**	**p-value**
Chi-square (χ^2)	26.020 (p = 0.099)	0.05
CFI	0.983	0.95
TLI	0.973	0.95
RMSEA	0.038	0.06
SRMR	0.039	0.08

3.6 First-order model measurement Evaluation

Factor loading analysis revealed significant variation in indicator reliability across constructs. The fiscal stimulus construct demonstrated strong measurement properties, with both “amount of support” (0.845) and “beneficiary status” (0.991) showing strong loadings. Enterprise performance, measured by profitability, achieved perfect loading (1.000) as a single-indicator construct.

However, the BMI construct exhibited concerning measurement characteristics. Only “equipment investment” achieved moderate loading (0.506), while all other indicators—digitalization (0.410), redesign (0.424) and courier/logistics (0.434)—showed weak loadings below the conventional 0.50 threshold. These weak loadings suggest potential measurement issues requiring model refinement.

Table 5: first-order model factor loadings

Construct	Indicator	Loading
Stimulus	Amount of support	0.845
	Beneficiary status	0.991
Performance	Profitability	1.000
BMI	Equipment investment	0.506
	Digitalization	0.410
	Redesign	0.424
	Courier/logistics	0.434

3.7 First-order structural model results

The structural model analysis revealed unexpected findings that challenge conventional assumptions about fiscal stimulus effectiveness. The direct effect of stimulus on performance was significant but negative (β = -0.264, p = 0.003), suggesting that fiscal support may have inadvertently hindered enterprise performance. Neither the stimulus-to-BMI pathway (β = -0.097, p = 0.094) nor the BMI-to-performance relationship (β = 0.026, p = 0.873) achieved statistical significance. Mediation analysis confirmed the absence of indirect effects, with the stimulus-BMI-performance pathway showing no significant mediation (β = -0.003, p = 0.873). The total effect of stimulus on performance remained significantly negative (β = -0.266, p = 0.002), indicating that the observed negative relationship operates primarily through direct mechanisms rather than through business model innovation.

Table 6: Direct Effects:

Path	Estimate	SE	z-value	p-value	Std. β	Sig.
Stimulus-Performance effect	-0.264	0.088	-2.989	0.003	-0.174	**
Stimulus-BMI effect	-0.097	0.058	-1.675	0.094	-0.134	
BMI-Performance effect	0.026	0.162	0.160	0.873	0.012	

Table 7: Indirect Effect:

Path	Estimate	SE	z-value	p-value	Std. β	Sig.
Stimulus-BMI-Performance effect	-0.003	0.016	-0.160	0.873	-0.002	

3.8 Second-order model specification and fit

The second-order SEM addressed measurement concerns by restructuring BMI as a hierarchical construct comprising three theoretical dimensions: value creation, value delivery, and value capture. This specification maintained excellent model fit (χ^2 = 20.524, p = 0.198; CFI = 0.990; TLI = 0.983; RMSEA = 0.030), demonstrating that theoretical refinement did not compromise statistical adequacy.

Table 8: Goodness-of-fit indicator for second level SEM

Fit Index	Value
Chi-square (χ^2)	20.524
Degrees of Freedom	16
CFI	0.990
TLI	0.983
RMSEA	0.030
RMSEA 90% CI	[0.000, 0.065]
SRMR	0.035

3.9 Second-order measurement model assessment

The hierarchical structure revealed both improvements and persistent challenges in construct measurement. At the first-order level, value creation and value delivery dimensions showed weak to moderate indicator loadings (0.329-0.499), while value capture was measured by a single indicator. However, at the second-order level, BMI showed strong relationships with value creation (0.831) and value delivery (1.595), though the latter suggests potential multicollinearity concerns.

Table 9: Second-order measurement model results

Construct Level	Indicator/Dimension	Loading
First-order:		
Value Creation	Digitalization	0.428
	Equipment investment	0.499
Value Delivery	Courier systems	0.329
	Redesign	0.349
Second-order:		
BMI	Value creation	0.831
	Value delivery	1.595
	Value capture	0.413

3.10 Second-order structural results

The second-order model reproduced the concerning pattern observed in first-order model. Fiscal stimulus maintained a significant negative effect on performance (β = -0.262, p = 0.003), while showing no significant influence on BMI (β = -0.073, p = 0.108). The BMI-performance relationship remained non-significant (β = 0.007, p = 0.810), confirming the absence of innovation-mediated pathways.

Table 10: second-order structural results

Dependent Variable	Predictor Variable	Estimate	Standard Error	z-value	p-value
Performance	Stimulus	–0.262	0.087	–3.016	0.003
BMI	Stimulus	–0.073	0.046	–1.606	0.108
BMI	Performance	0.007	0.027	0.240	0.810

Trimmed Model Analysis

Model Optimization

Given persistent measurement issues, a trimmed model retained only the most robust BMI indicator (revenue model adaptation). This parsimonious specification achieved perfect fit statistics (CFI = 1.000, RMSEA = 0.000), though such perfect fit may indicate model over-specification or limited complexity.

Final Structural Results

The trimmed model confirmed key findings while revealing nuanced relationships. The negative stimulus-performance effect persisted (β = -0.263, p = 0.002), and stimulus showed no significant influence on BMI (β = 0.021, p = 0.810). Interestingly, performance demonstrated a marginally significant positive effect on BMI (β = 0.103, p = 0.077), suggesting that innovation may be reactive rather than proactive—emerging as enterprises achieve success rather than driving it.

Table 11: final trimmed model results

Path	Estimate	SE	z-value	p-value
Stimulus-performance effect	-0.263	0.086	-3.047	0.002
Stimulus-BMI effect	0.021	0.086	0.241	0.810
Performance-BMI effect	0.103	0.058	1.769	0.077

4.0 DISCUSSION OF FINDINGS

4.1 Unexpected negative stimulus effects

The consistent negative relationship between fiscal stimulus and enterprise performance across all model specifications presents a counterintuitive finding that challenges conventional assumptions about fiscal policy effectiveness. This is contrary to existing empirical evidence in the literature (Chibi et al., 2019; Dzigbede & Pathak, 2020; Lim et al., 2021) and thus several theoretical explanations merit consideration. For instance, the fiscal support might have crowded-out private initiative or investment, leading enterprises to substitute external support for internal capability development. This could result in short-term stability but long-term performance deterioration. Also, the negative effects may stem from poorly designed or implemented support mechanisms that create administrative burdens, compliance costs, or misaligned incentives that ultimately harmed rather than helped recipient enterprises.

4.2 Absence of innovation-mediated effects

The lack of significant stimulus-BMI relationships across all models suggests that fiscal interventions did not translate into meaningful business model innovations. This finding contradicts theoretical expectations and may reflect several factors (Al-Nimer et al., 2021; Guo et al., 2017). For instance, MSMEs may lack the absorptive capacity, managerial capabilities, or technical knowledge necessary to translate financial support into systematic BMI. Also, the fiscal interventions may have been designed primarily for survival rather than transformation, focusing on immediate relief rather than strategic innovation support. However, the weak factor loadings observed across BMI indicators suggest potential measurement issues that may obscure true innovation effects.

4.3 Policy Implications

These findings have significant implications for both policy design. The negative stimulus effects suggest the need for more sophisticated support mechanisms that emphasize capacity building, strategic guidance, and performance-linked incentives rather than unconditional financial transfers. The absence of stimulus-innovation linkages challenges linear models of policy-innovation-performance relationships, suggesting more complex, context-dependent mechanisms. The results highlight the importance of internal capacities and market dynamics over external support in driving both innovation and performance outcomes.

5.0 CONCLUSION

This study examined the relationship between fiscal interventions and MSME growth performance in Ghana, with particular emphasis on the mediating role of business model innovation during the COVID-19 pandemic. The primary finding revealed a consistent and statistically significant negative relationship between fiscal stimulus interventions and enterprise performance. This seems to suggest that rather than enhancing MSME performance, the COVID-19 fiscal support mechanisms may have inadvertently created misaligned incentives that ultimately hindered enterprise growth. In effect, this fundamentally challenges the theoretical position that external fiscal support generally translates into improved firm-level outcomes. Equally significant is the absence of meaningful BMI mediation effects. Despite theoretical expectations that fiscal interventions would stimulate innovation activities, the study found no significant fiscal stimulus-BMI effect. This suggests that fiscal support mechanisms were ineffective in promoting strategic business model transformations necessary for sustainable competitive advantage during crisis periods.

Limitations and direction for future research

Several limitations should be acknowledged. The cross-sectional design limits causal inference, measurement challenges with BMI constructs require methodological refinement, and the focus on a single urban context may limit generalizability. Future research should employ longitudinal designs, develop context-specific innovation measures, and examine varied policy implementation approaches to better understand these complex relationships.

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