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Markets that Matter: Bonds, Insurance, and Economic Growth

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Abstract

Purpose: This study primarily examines the effect of bond and insurance market development on economic growth; however, it also investigates the impact of capital formation, employment, foreign direct investment, trade openness, and urbanization on economic growth by employing a sample of 46 countries worldwide for the period 2000-2021.

Design/methodology/approach: This study employed a quantitative explanatory research design using balanced panel data, which was obtained from the Global Financial Development Database and the World Development Indicators were analyzed using fixed-effects and random-effects panel regression to examine the causal relationship.

Findings: The outcome reveals that bond market development favorably impacts economic growth. The measures of insurance growth, life insurance, nonlife insurance, and total premiums favorably influence economic prosperity. As expected, gross fixed capital formation and employment stimulate economic growth. Moreover, foreign direct investment and trade openness have a negligible impact on economic growth. Urbanization hurts economic growth.

Conclusion: The findings highlight the pivotal role of bond market and insurance market development in fostering economic growth, highlighting the importance of strengthening financial market institutions to achieve sustainable increases in GDP per capita.

Implications: Policymakers could use these findings to increase desired growth. This could be achieved through developing both bond and insurance markets, decreasing unemployment, and limiting rapid urbanization by increasing rural facilities.

Originality/value: The study gives new empirical evidence on how bond market development and insurance market development influence economic growth worldwide. This topic has received less emphasis in earlier empirical studies, especially the influence of the bond market on economic growth worldwide.

JEL Classification: G10, G22, O16, O47

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Introduction

Bond market development (BMD) contributes to economic growth by efficiently channeling savings into productive investments while reducing interest rates as well as transaction and monitoring costs (Adeyeye et al., 2015; Pradhan et al., 2020). Consistent with the finance-led growth hypothesis, an expanded bond market provides long-term financing to entrepreneurs, facilitating business expansion, innovation, infrastructure development, and ultimately employment generation. The resulting increase in income levels stimulates aggregate demand for goods and services, thereby reinforcing economic growth. Empirical evidence from Pradhan et al. (2020) and Wahidin et al. (2021) supports this positive association. However, contrasting findings also exist, as Thumrongvit et al. (2013) report a negligible impact of the corporate bond market on economic growth, particularly in developing economies, suggesting that its growth-enhancing role may be limited in certain contexts. Although BMD is theorized as an important driver for economic growth because it channels saving into productive investments and offers long-term financing for profitable ventures, empirical evidence remains inconsistent; while some previous studies confirm its favorable impact, others report negligible impacts in developing economies, showing a critical gap in understanding the contextual conditions under which bond markets effectively contribute to GDP per capita.

Similarly, insurance market development (IMD) promotes economic growth by mobilizing savings from surplus units to deficit units (Budhathoki & Bhattarai, 2024; Oli, 2023) and providing risk-transfer mechanisms that protect policyholders against unforeseen losses (Pradhan et al., 2023). Through the accumulation of premiums, insurance firms allocate funds to households and corporate sectors, thereby enhancing investment capacity (Upadhyaya et al., 2025). By reducing risk and encouraging risk-averse entrepreneurs to undertake innovative and research-intensive projects, the insurance sector contributes to productivity gains and long-term growth. From the perspective of Financial Intermediation Theory, insurance companies also reduce information asymmetry and transaction costs, thereby lowering the cost of capital and expanding investment opportunities. Empirical studies by Imran et al. (2024), Pradhan et al. (2019), and Pradhan et al. (2023) provide supporting evidence for this positive relationship. Nonetheless, Gracia and Atienza (2025) find that the impact of insurance market development on economic growth remains negligible in some contexts, indicating mixed empirical outcomes.

The theoretical underpinning and previous empirical studies also reveal that economic growth is influenced by other factors such as gross capital formation, employment rate, FDI, trade, and level of urbanization. The "Exogenous Growth Model" states that growth is mainly affected by capital and labor, while the "Endogenous Growth Model" posits that growth is impacted by human capital development and innovation. For instance, the current literature depicts that Gross Fixed Capital Formation (GFC) favorably impacts growth since the entrepreneurs invest in physical capital, such as plant and machinery, equipment, and infrastructure, with the expectation of profit, and it increases efficiency and productivity, which stimulates growth by producing more outputs. The recent studies of Arabiat (2024) and Oyebowale and Algarhi (2020) support this fact. Nevertheless, Yeboah et al. (2025) find that the GCF does not impact growth in the short term. This shows that the impact of the GCF on growth is still inconclusive. Okun's (1962) Law and most of the findings of current empirical literature (Kachunga et al., 2026; Mohamed & Abdi, 2024) support that employment stimulates growth.

The increase in employment also stimulates the demand for goods and services, which ultimately increases outputs to meet customers' demand and boost growth. The impact of Foreign Direct Investment (FDI) on growth is still inconclusive and reveals either favorable or unfavorable results. For instance, the recent studies of Abdulkarim (2023), Banday et al. (2021), Kushwaha and Nair (2025), and Liu et al. (2025) revealed a favorable impact of FDI on growth, while Yeboah et al. (2025) reported an adverse effect of FDI on growth, especially in the long run. Moreover, it is expected that FDI stimulates growth by (a) transferring technology and capital, and (b) empowering human resources.

The link between trade openness and growth is inconclusive until now. For instance, Adetokunbo and Yusuf (2024), Bouattour et al. (2026), Ngoc et al. (2025), and Yeboah et al. (2025) found a favorable impact of trade openness on growth, while Arabiat (2024) and Ogudu et al. (2024) found an adverse effect of trade openness on growth. Moreover, it is argued on the one hand that import facilitates to buy quality raw materials and technology, which increases efficiency and productivity and stimulates growth. On the other hand, the export enlarges markets for goods and services, which reduces production costs and improves competitiveness in the foreign market, and ultimately stimulates growth.

Similarly, the nexus between urbanization and growth is unclear. For instance, a recent study of Albanese et al. (2025) found that urbanization favorably impacts growth in developing countries and adversely affects growth in the developed world. It is argued that urbanization regularly supplies a quality labor force at a reasonable cost in developing countries and boosts growth. Nonetheless, Shaban et al. (2024) argued that urbanization increases the costs of keeping cities up to date at the expense of cutting funds for rural areas, which diminishes growth.

The mixed empirical evidence on the determinants of economic growth, ranging from positive to negligible effects, highlights the need for further investigation into the role of financial market development. Motivated by these inconsistent findings, this study examines the impact of BMD on economic growth using a relatively recent and cross-country dataset covering 46 nations, thereby addressing the limitations of prior studies that have relied on narrower or outdated samples. In addition, the study explores the effect of IMD on economic growth, an issue that remains widely debated in the literature regarding its true growth-enhancing potential. Accordingly, this study examines the effects of both BMD and IMD on economic growth within a unified empirical framework, while also incorporating key macroeconomic control variables, Gross Capital Formation (GCF), employment, foreign direct investment, trade openness, and urbanization, to enhance the robustness, validity, and broader generalizability of the findings.

Thus, this study primarily fills the empirical study gap by offering evidence of the impact of BMD and IMD on GDP per capita by taking a large sample of 46 countries worldwide. It also examines the effect of macroeconomic determinants on GDP per capita and improves the validity and generalizability of the previous empirical studies.

Literature Review

Theoretical Underpinning

The relationship between the explanatory variables and economic growth can be understood through several established economic theories. The nexus between BMD and growth is explained by the "Finance-Led Growth Hypothesis" (FLGH)**,** initially proposed by Schumpeter (1911) and later advanced by McKinnon (1973) and Shaw (1973). According to this hypothesis, a well-developed financial market enhances economic growth by reducing transaction and monitoring costs, minimizing information asymmetries, and efficiently allocating financial resources (Adeyeye et al., 2015). Bond markets mobilize savings and channel them into productive investments by lowering borrowing costs and spreading risk. This enables firms and governments to finance innovation, business expansion, infrastructure projects, and other productive activities that increase output, generate employment, and stimulate economic growth. Recent studies by Pradhan et al. (2019) and Said and Hammam (2024) further support the FLGH, showing that the development of stock, bond, and insurance markets contributes positively to economic growth.

The relationship between insurance development and economic growth can be explained through "Financial Intermediation Theory". As financial intermediaries, insurance companies collect premiums from policyholders and invest these funds in productive sectors of the economy (Gurley & Shaw, 1955). By reducing uncertainty, transaction costs, and information asymmetries, insurance institutions facilitate efficient resource allocation (Diamond, 1984). Insurance also mitigates adverse selection and moral hazard

problems while protecting against potential losses. This risk-sharing function encourages entrepreneurship, innovation, business expansion, and FDI, thereby increasing employment, income, and aggregate demand, which ultimately fosters economic growth.

The contribution of GCF to economic growth is grounded in the "Neoclassical Growth Model" developed by Solow (1956) and Swan (1956). This model posits that economic output depends on capital, labor, and total factor productivity. Investment in physical capital, such as machinery, equipment, plants, and infrastructure, enhances labor productivity and productive capacity, leading to higher output and sustained economic growth.

The employment-growth nexus is explained by "Okun's Law" (Okun, 1962), which establishes a positive relationship between employment and economic activity. Higher employment levels increase household income, thereby raising the demand for goods and services. In response to rising demand, firms expand production, resulting in higher output and economic growth. Empirical evidence from Kachunga et al. (2026) further supports this relationship.

The relationship between FDI and economic growth can be explained by "Endogenous Growth Theory", which emphasizes the role of knowledge, technology, and human capital in driving long-term growth. FDI facilitates the transfer of advanced technology, managerial expertise, physical capital, and skills, which improve productivity, efficiency, and innovation within the host economy. These improvements enhance production capacity and contribute to sustained economic growth.

Similarly, the connection between trade openness and economic growth is explained by the "Trade-Led Growth Hypothesis" (TLGH). This hypothesis incorporates both the export-led and import-led growth perspectives. The export-led growth argument suggests that exports promote specialization, economies of scale, and productivity improvements, thereby enhancing economic performance. Conversely, the import-led growth perspective highlights the role of imports in providing access to advanced technologies, high-quality intermediate goods, and capital equipment that improve efficiency and productivity. Together, these mechanisms imply that greater trade openness promotes economic growth. Bouattour et al. (2026) provide empirical support for this hypothesis, finding a positive impact of trade openness on economic growth.

Finally, the relationship between urbanization and economic growth can be understood through the "Structural Transformation and Urbanization Theory". This theory argues that the transition from predominantly rural economies to more urbanized and industrialized societies facilitate economic development. Urbanization supports industrial expansion by providing a concentrated and relatively stable labor force, improving access to infrastructure, and promoting agglomeration economies (Kuznets, 1966). These factors enhance productivity, innovation, and economic efficiency, thereby contributing to higher economic growth.

Based on the foregoing theoretical foundations, a conceptual framework is developed to illustrate the relationships between bond market development, insurance development, gross capital formation, employment, foreign direct investment, trade openness, urbanization, and economic growth.

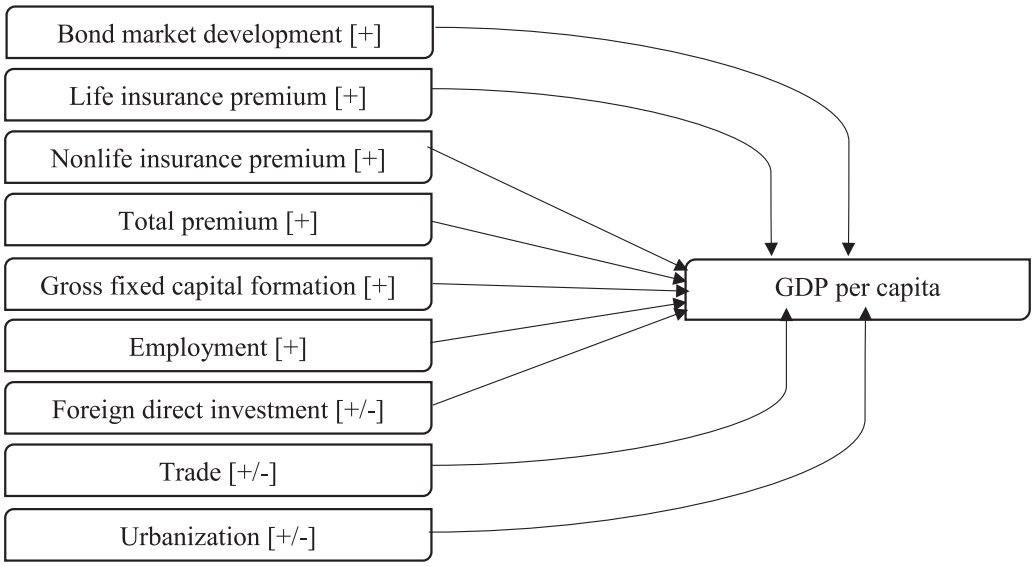


Figure 1: Conceptual Framework

Bond Market and GDP per Capita

BMD is expected to promote economic growth by efficiently channeling savings into productive investment, providing liquidity, diversifying risk, and supplying long-term financing to governments and corporate sectors. However, its growth-enhancing role may be constrained by poor institutional quality and financial repression, which can limit capital allocation efficiency and weaken its overall impact on the economy.

Empirical evidence largely supports a positive relationship between BMD and economic growth, although with some variations across contexts. Thumrongvit et al. (2013), using data from 38 countries (1989–2010) and the GMM estimator, found that government bond markets and stock market development positively influence growth, while corporate bond markets exhibit a negligible effect. Similarly, Pradhan et al. (2019) reported that BMD significantly promotes growth in 20 European countries (1989–2016), also highlighting its indirect effect through innovation and productivity enhancement. Extending this evidence, Pradhan et al. (2020) confirmed that both stock and bond market development stimulate economic growth in G-20 economies.

However, some studies present mixed or context-dependent findings. Wahidin et al. (2021) observed that BMD had a positive impact on growth before the Global Financial Crisis, but its effect became inconclusive thereafter, a pattern also supported by Asteriou and Spanos (2019) in the EU context. This shift is attributed to firms increasingly relying on bond financing for short-term and low-risk investments rather than long-term productive projects after the crisis. Likewise, Ngoc et al. (2025) found that while banking sector development positively affects growth in developing countries, stock market development has only a minimal impact, suggesting variation in the effectiveness of different financial channels.

Thus, the empirical literature suggests a generally positive but context-sensitive relationship between bond market development and economic growth. Accordingly, the study proposes the following hypothesis:

H1: Bond market development positively influences GDP per capita.

Insurance Market and GDP per Capita

IMD is expected to positively influence economic growth by mitigating risk for entrepreneurs, thereby encouraging investment and innovation. It also promotes savings by incentivizing individuals to purchase insurance products, while insurance companies mobilize these accumulated funds into productive investments, ultimately supporting economic expansion. Empirical evidence largely supports this relationship, as Pradhan et al. (2019), using data from 20 EU countries over the period 1989–2016, also find that insurance market development contributes positively to economic growth. Adopting a VCEM estimator, it was found that the IMD favorably affects the growth in EU nations.

Similarly, Pradhan et al. (2023) investigated the IMD-growth nexus, adopting a sample of both "high- and middle-income countries" for the period 1980-2019, employing the PVAR estimator, and found that both life- and nonlife insurance premiums stimulate growth. This finding indicates that insurance facilitates mobilizing savings into productive sectors by offering a risk transfer facility for any unexpected losses to policyholders. It further motivates even risk-averse investors to invest in risky ventures, which stimulates innovation that increases productivity and enhances growth.

However, Gracia and Atienza (2025) analyzed the insurance-growth nexus for the period 1983-2020 in Portugal and found that insurance did not impact growth, and growth also did not impact insurance. Imran et al. (2024) analyzed the insurance-growth nexus using the sample period 1994Q1-2022Q4 in China and found that (using quantile regression) insurance favorably impacts growth in China. The outcome revealed that economic growth also helps to foster IMD. This indicates that insurance reduces uncertainty and motivates investors to invest in risky projects. It also channels funds to productive sectors by investing in the capital market, which increases efficiency in investment and boosts economic growth. Accordingly, the study proposes the following hypothesis:

H2a: Life insurance premiums positively influence GDP per capita.

H2b: Non-life insurance premiums positively influence GDP per capita.

H2c: Total insurance premiums positively influence GDP per capita.

Gross Fixed Capital Formation and GDP per Capita

The Infrastructure-Led Growth hypothesis states that productive investment in infrastructure, for example, investment in roads, energy, and telecommunication, leads to growth by improving productivity, reducing transaction costs, and attracting private investment. Most of the recent literature also shows the favorable nexus between the GCF and growth. For instance, Uneze (2013) analyzed the impact of the GFCF on growth in the African context for the period 1985-2007. The outcome demonstrated using "panel Granger causality" that the increase in GFCF stimulates growth, and growth also increases the GCF. This suggests that the likelihood of higher growth encourages entrepreneurs to invest more in capital goods (i.e., machinery, factories, tools, and infrastructure) with the expectation of more profits. More investment in capital goods through more savings boosts future outputs, which increases economic growth. Oyebowale and Algarhi (2020) analyzed the factors of growth, considering a sample of 21 African nations for the period 1986-2015.

Working with the PMG estimator, the outcome showed that the effect of capital formation was favorable in African countries. Arabiat (2024) analyzed the impact of trade openness on growth in Jordan, working with a sample period 2000-2023, and found that capital formation favorably affects growth both in the short- and long-term in Jordan. Yeboah et al. (2025) found that there was no short-term impact of GCF on growth, but it turned positive in the long run. Accordingly, the study proposes the following hypothesis:

H3: Gross fixed capital formation positively influences GDP per capita.

Employment and GDP per Capita

The increase in the employment rate boosts the income level of individuals, which increases demand for goods and services and leads to increased growth. Most of the earlier studies also showed a favorable impact of employment on growth. Mohamed and Abdi (2024) examined the effect of unemployment on growth, using a sample period 1991-2021 in the context of Somalia. The study deployed the VCEM estimator and found that unemployment has an adverse impact on growth in Somalia. This finding supports Okun's (1962) law, which states that the "aggregate demand" of products is directly related to employment status. On the one hand, while the demand for products increases, more goods are produced, which ultimately increases the demand for labor supply. The demand for the product decreases; on the other hand, firms cut their production, that decrease/increase employment/unemployment status. Kachunga et al. (2026) analyzed the employment-growth nexus working with a sample period 1990-2023 in Tanzania. Utilizing the VAR estimator, the result demonstrated that employment stimulates growth in Tanzania. Also, the Granger causality result concludes that unidirectional causality runs from employment to growth. Accordingly, the study proposes the following hypothesis:

H4: Employment positively influences GDP per capita.

Foreign Direct Investment and GDP per Capita

FDI facilitates technology transfer, capital inflows, and human capital development, thereby contributing to economic growth. However, its effectiveness depends on factors such as human capital, institutional quality, and infrastructure development.

Empirical studies largely report a positive relationship between FDI and economic growth. For example, Banday et al. (2021), using data from BRICS countries (1990–2018), found that FDI promotes economic growth and that growth, in turn, attracts further FDI, indicating a bidirectional causal relationship. Similarly, Kushwaha and Nair (2025) reported a positive impact of FDI on economic growth in India (1997–2014), highlighting its role in strengthening sectors such as financial services, information technology, telecommunications, and trade.

In a cross-country context, Yeboah et al. (2025) examined EU countries (1995–2021) using PMG and ARDL estimators and found that FDI has a positive short-run effect on growth, although the long-run impact becomes negative. Liu et al. (2025), analyzing 87 Belt and Road Initiative countries (2005–2019) using PCSE estimation, also found that FDI significantly enhances economic growth. Likewise, Ogudu et al. (2024) reported a positive long-run effect of FDI on growth in Nigeria (1980–2017), while Abdulkarim (2023) confirmed a bidirectional relationship between FDI and growth. Thus, the empirical evidence suggests that FDI generally promotes economic growth, though its impact may vary across time horizons and institutional contexts. This leads to the following hypothesis:

H5: Foreign direct investment significantly influences GDP per capita.

Trade Openness and GDP per Capita

Trade openness expands market access. It also increases competition and increases efficiency, which increases productivity and ultimately leads to a boost in growth. For instance, Banday et al. (2021) investigated the impact of FDI and trade openness on growth in the BRICS nations for the period 1990-2018, and found that trade openness creates an environment for growth. This indicates that trade openness, mainly exports, helps to reduce production costs via economies of scale, which increases competitiveness in the foreign market and increases domestic consumption.

Ngoc et al. (2025) investigated the nexus between financial development and growth, adopting 30 developing nations as a sample for the period 2010-2023. This study also examined the influence of trade openness on growth and found that trade openness favorably impacts growth in developing nations using

the GLS estimator. Conversely, Arabiat (2024) analyzed the effect of trade openness on growth in Jordan, working with a sample period 2000-2023. Employing the ARDL estimator, the study found that trade openness adversely affects growth in Jordan. Yeboah et al. (2025) found that trade openness has a favorable short-term impact on growth, but it has an adverse effect on the long term. Nevertheless, Adetokunbo and Yusuf (2024) also found no linkage between trade openness and growth, while it turned into positive in the long run if strong financial institutional quality prevails.

Moreover, Monyela and Saba (2024) analyzed the effect of trade openness on growth in South Africa, covering the period 1991-2021, and found that trade openness favorably affects growth. However, Ogudu et al. (2024) examined the FDI-growth nexus in Nigeria, working with a sample period 1980-2017, and found that trade openness adversely affects growth in the long run in Nigeria. Bouattour et al. (2026) analyzed the trade-growth nexus working with the sample period 1990-2021 in the "Arab Maghreb Union". Utilizing the PSTAR estimator, the outcome revealed that trade favors impact growth, which supports the trade-led growth (TLG) hypothesis. This leads to the following hypothesis:

H6: Trade openness significantly influences GDP per capita.

Urbanization and GDP per Capita

Urbanization can have both positive and negative effects on economic growth, depending on a country's level of development. Albanese et al. (2025), using data from 1991–2022 and a fixed-effects estimator, found that urbanization promotes economic growth in developing countries but has a negative effect in developed economies. This divergence is often attributed to differences in infrastructure capacity and economic structure: in developing countries, urbanization improves resource allocation, expands labor market efficiency, and attracts investment, thereby supporting growth. In contrast, in developed economies, excessive urban concentration may generate congestion, pollution, housing constraints, and infrastructure strain, which can reduce productivity and weaken growth performance.

Similarly, Shaban et al. (2024), analyzing 106 countries over the period 1971–2019, highlighted a bidirectional relationship between urbanization and economic growth. Their findings suggest that in high- and upper-middle-income countries, economic growth tends to drive urbanization, reflecting a more saturated urban development stage where additional urban expansion may yield diminishing returns. Conversely, in developing countries, urbanization acts as a driver of growth by improving market access, enabling economies of scale, supporting product diversification, and fostering innovation.

Thus, the empirical evidence indicates that the urbanization-growth nexus is context-dependent, varying across income levels and stages of development. This leads to the following hypothesis:

H7: Urbanization positively influences GDP per capita.

Research Methods

The study adopts a quantitative explanatory research design using balanced panel data to examine the impact of BMD, insurance premiums, capital formation, employment, FDI, trade openness, and urbanization on economic growth. The research utilizes secondary panel data obtained from the Global Financial Development Database (GFDD) and the World Development Indicators (WDI), covering 46 countries over the period 2000–2021. The panel structure combines cross-sectional variations across countries with longitudinal observations over time, enabling a comprehensive assessment of the dynamic relationships between the selected macroeconomic variables and economic growth. The data, especially for the BMD and insurance premiums, were not available for lower-middle-and lower-income countries, for the period after 2021.

The selection of sample countries was based on data availability, as the study includes only a limited number of countries due to the lack of comprehensive data for many lower-middle-income and low-income economies. The sample countries consist of high-income (32), upper-middle-income (11), and lower-middle-income (3) countries. The study included 46 countries (with 1012 observations) as a sample. The list of the sample countries is presented in Table 1 (Panel B). Also, the variable descriptions are presented in Table 1 (Panel A).

Table 1: Variables Description and Sample Countries

Panel A: Variable Descriptions				
Variables	**Symbol**	**Measurements**	**Previous studies**	**Source**
GDP per capita	GDPPC	"GDP per capita (constant 2015 US$)"	Thumrongvit et al. (2013) and Ngoc et al. (2025)	WDI (2025)
Bond market development	BMD	"Corporate bond issuance volume to GDP (%)"	Thumrongvit et al. (2013) and Pradhan et al. (2019)	GFDD (2022)
Life insurance premium	LIP	"Life insurance premium volume to GDP (%)"	Imran et al. (2024) and Pradhan et al. (2023)	GFDD (2022)
Nonlife insurance premium	NLIP	"Nonlife insurance premium volume to GDP (%)"	Pradhan et al. (2023) and Imran et al. (2024)	GFDD (2022)
Total premium	TP	"Total insurance premium volume to GDP (%)"	Imran et al. (2024)	Own calculation
Gross fixed capital formation	GCF	"Gross fixed capital formation (% of GDP)"	Uneze (2013), Oyebowale and Algarhi (2020), Said and Hammam (2024), Arabiat (2024), and Yoboah et al. (2023)	WDI (2025)
Employment	EMP	"Employment to population ratio, 15+, total (%) (modeled ILO estimate)"	Arabiat (2024)	WDI (2025)
Foreign direct investment	FDI	"Foreign direct investment, net inflows (% of GDP)"	Banday et al. (2021), Kushwaha and Nair (2025)	WDI (2025)
Trade	Trade	"Trade (% of GDP)"	Pradhan et al. (2016), Thumrongvit et al. (2013), Arabiat (2024), and Ngoc et al. (2025)	WDI (2025)
Urbanization	URB	"Urban population growth (annual %)"	Albanese et al. (2025)	WDI (2025)
Panel B: List of Sample Countries				
"Argentina, Australia, Austria, Belgium, Brazil, Canada, Switzerland, Chile, China, Colombia, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Greece, Hong Kong SAR, China, Croatia, Hungary, Indonesia, India, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Rep., Luxembourg, Mexico, Malaysia, Netherlands, Norway, New Zealand, Peru, Philippines, Poland, Portugal, Russian Federation, Saudi Arabia, Singapore, Sweden, Thailand, United States, South Africa" (46 countries).				

Descriptive statistics were employed to summarize the fundamental characteristics of the regressand and regressors. Additionally, a correlation matrix was developed to examine the presence of multicollinearity

among the regressors. As multicollinearity issues were identified (r > .70) (Noortman et al., 2025), highly correlated regressors were not incorporated simultaneously into the same regression model.

As a pre-estimation procedure, the Hausman test was conducted to determine the appropriate model between fixed-effects and random-effects specifications, with the null hypothesis indicating that the random-effects model is preferred over the fixed-effects model. Furthermore, the Breusch–Pagan Lagrange Multiplier (LM) test was performed to select between pooled ordinary least squares (POLS) and random-effects models, where the null hypothesis assumes that the POLS model is more appropriate than the random-effects model. The model specifications developed to address the research objectives are presented in the following subsection.

Model Specification

The study examined the influence of bond market, insurance premium, capital formation, employment, FDI, trade, and urbanization on growth. Hence, we express it in the functional form as:

$$\text{GDPPC} = f(BMD, LIP, NLIP, TP, GCF, EMP, FDI, Trade, URB)$$

"FE estimator considers the heterogeneity" among 46 countries and gives individual intercept, but "it is time-invariant" (Gujarati, 2015). The study proposed the FE model as follows.

$$lnGDPPC_{it} = a_{1i} + \beta_1 BMD_{it} + \beta_2 LIP_{it} + \beta_3 NLIP_{it} + \beta_4 TP_{it} + \beta_5 GCF_{it} + \beta_6 EMP_{it} + \beta_7 FDI_{it} + \beta_8 Trade_{it} + \beta_9 URB_{it} + \in_{it} \quad \ldots\ldots\ldots\ldots (1)$$

The RE estimator assumes a common (global) intercept for all 46 countries, which is denoted by a_1, and each country's intercept is accounted for by u_i. The study proposed the RE model as follows.

$$lnGDPPC_{it} = a_1 + \beta_1 BMD_{it} + \beta_2 LIP_{it} + \beta_3 NLIP_{it} + \beta_4 TP_{it} + \beta_5 GCF_{it} + \beta_6 EMP_{it} + \beta_7 FDI_{it} + \beta_8 Trade_{it} + \beta_9 URB_{it} + \in_{it} + u_i + \in_{it} \quad \ldots\ldots\ldots\ldots (2)$$

where, $lnGDPPC$ denotes the natural logarithm of GDP per capita, i represents the country, and t denotes the year. a_{1i} denotes the intercept of each country. $\beta_1, \beta_2 \ldots\ldots\ldots, \beta_9$ represent the coefficients of predictor variables. a_1 denotes global intercept. u_i denotes the country's specific effect, and $\in_{it}$ denotes error term.

Results and Analysis

Descriptive Statistics

The descriptive statistics presented in Table 2 indicate substantial variation among the study variables. GDPPC recorded an average value of US$ 29,270.33 with considerable dispersion (SD = 23,150.53). Among the insurance indicators, LIP exhibited greater variability than NLIP, suggesting larger cross-country and temporal differences in life insurance penetration. Similarly, FDI and trade demonstrated notable fluctuations, reflecting significant differences in international investment and trade openness across the sampled economies. Thus, the observed variations among the variables suggest sufficient heterogeneity in the panel dataset for subsequent econometric analysis.

Table 2: Descriptive statistics

Variables	Obs.	Mean	SD	Min.	Max.
GDPPC (US$)	1012	29270.33	23150.53	756.704	112417.9
BMD (%)	1012	1.994	1.848	-4.087	16.715
LIP (%)	1012	3.239	2.989	.000	20.811
NLIP (%)	1012	1.612	.812	.002	8.155
TP (%)	1012	4.851	3.401	.005	22.021
GCF (%)	1012	22.866	4.919	10.970	53.020
EMP (%)	1012	57.241	7.033	36.798	76.388
FDI (%)	1012	5.504	13.646	-117.234	234.311
Trade (%)	1012	94.451	78.108	19.559	442.62
URB (%)	1012	1.374	1.244	-4.170	10.624

Note(s). GDPPC denotes GDP per capita. BMD represents bond market development. LIP denotes life insurance premium. NLIP denotes non-life insurance premium. TP represents total insurance premium. GCF denotes gross fixed capital formation. EMP represents employment. FDI denotes foreign direct investment. URB represents urbanization.

Correlation Analysis

The results of the correlation analysis are displayed in Table 3. The results show that the BMD has a positive link with GDPPC. All insurance growth measures—LIP, NLIP, and TP—are directly associated with GDPPC. Notably, it is found that TP and LIP are highly correlated ($r > .70$) and show signs of collinearity issues. Therefore, the study does not perform regression analysis including both variables in the same regression model. However, the result revealed that TP and NLIP do not have a collinearity issue ($r < .70$). Also, the outcome demonstrated that the TP has a direct but negligible association with the GDPPC. Conversely, the EMP, FDI, and Trade have a direct and significant link with the GDPPC. Unexpectedly, the URB is adversely associated with GDPPC.

Table 3: Correlation Matrix

Variables	GDPPC	BMD	LIP	NLIP	TP	GCF	EMP	FDI	Trade	URB
GDPPC	1									
BMD	.464** (.000)	1								
LIP	.328** (.000)	.254** (.000)	1							
NLIP	.493** (.000)	.242** (.000)	.408** (.000)	1						
TP	.406** (.000)	.281** (.000)	.776** (.000)	.597** (.000)	1					
GCF	-0048 (.129)	.067* (.034)	-.076* (.016)	-.11** (.000)	-.09** (.003)	1				
EMP	.116** (.000)	.149** (.000)	-.09** (.000)	-.13** (.000)	-.11** (.000)	.351** (.000)	1			
FDI	.182** (.000)	.239** (.000)	.162** (.000)	-.045 (.154)	.132** (.000)	.005 (.885)	.032 (.314)	1		
Trade	.401** (.000)	.372** (.000)	.321** (.000)	-.059 (.059)	.268** (.000)	.031 (.326)	.067* (.034	.436** (.000)	1	
URB	-.11** (.000)	.049 (.123)	-.11** (.000)	-.29** (.000)	-.16** (.000)	.241** (.000)	.346** (.000)	-.045 (.149)	.033 (.292)	1

Note(s). GDPPC denotes GDP per capita. BMD represents bond market development. LIP denotes life insurance premium. NLIP denotes nonlife insurance premium. TP represents total insurance premium. GCF denotes gross fixed capital formation. EMP represents employment. FDI denotes foreign direct investment. URB represents urbanization.

Baseline Fixed-Effects Regression Anlysis

The results of baseline regression analysis are displayed in Table 4. As seen in the pre-estimation result, the Hausman test revealed that the FE estimator is superior to that of the RE estimator. The LM test also revealed that the RE estimator is better than that of the POLS estimator. Therefore, the study employed the FE estimator for baseline regression analysis and the RE estimator for the sensitivity analysis.

Turning to the main findings, the outcome demonstrated that the BMD stimulates growth and is consistent across the three models. Similarly, the measures of insurance growth—LIP, NLIP, and TP—favorably impact growth. This indicates that economic progress can be achieved through the development of the insurance sector. Also, the result demonstrated that the GCF boosts growth. Similarly, employment favorably impacts growth. However, FDI and trade openness have a negligible (insignificant) impact on growth. Notably, the study found an unexpected outcome of the influence of URB on growth. The URB adversely impacts growth.

Table 4: Baseline Regression Results (Fixed-Effect)

	Dependent variable: lnGDPPC		
Variables	**(1)**	**(2)**	**(3)**
BMD	.025***	.025***	.027***
	(.000)	(.000)	(.000)
LIP		.011**	
		(.016)	
NLIP			.049***
			(.000)
TP	.012***		
	(.002)		
GCF	.262***	.262***	.244***
	(.000)	(.000)	(.000)
EMP	.791***	.787***	.829***
	(.000)	(.000)	(.000)
FDI	-.000	-.000	-.000
	(.244)	(.253)	(.368)
Trade	.037	.037	.041
	(.290)	(.296)	(.248)
URB	-.035**	-.036***	-.035***
	(.000)	(.000)	(.000)
Constant	5.637***	5.682***	5.500***
	(.000)	(.000)	(.000)
No. of observations	1012	1012	1012
F-stat.	29.56***	28.84***	30.00***
	(.000)	(.000)	(.000)
R-squares	.178	.174	.180
Hausman test	15.31**	16.21**	84.45***
	(.032)	(.023)	(.000)
LM test	7725.94***	7618.83***	7198.99***
	(.000)	(.000)	(.000)

Note(s). GDPPC denotes GDP per capita. BMD represents bond market development. LIP denotes life insurance premium. NLIP denotes non-life insurance premium. TP represents the total insurance premium. GCF denotes gross fixed capital formation. EMP represents employment. FDI denotes foreign direct investment. URB represents urbanization.

Robustness Check

The results of the sensitivity analysis are displayed in Table 5. The results demonstrate that the BMD stimulates growth and is consistent in three models using FE estimators and results of baseline regression analysis. Similarly, the insurance growth as measured by LIP, NLIP, and TP boosts growth and is consistent with the three models using FE estimators and outcomes of baseline regression analysis.

As expected, the GCF and EMP have a favorable impact on economic prosperity. These findings are consistent across three models estimated by RE estimators and baseline regression results. Conversely, FDI has an insignificant impact on growth, consistent with the baseline results. Trade openness has an insignificant impact on growth, consistent with the baseline results. As expected, the URB impacts growth as measured by GDPPC, and is consistent with the baseline results.

Table 5: Robustness Check Results (Random-Effect)

	Dependent Variable: lnGDPPC		
Variables	**(1)**	**(2)**	**(3)**
BMD	.025**	.026***	.027***
	(.000)	(.000)	(.000)
LIP		.012***	
		(.002)	
NLIP			.057***
			(.000)
TP	.014***		
	(.000)		
GCF	.262***	.262***	.241***
	(.000)	(.000)	(.000)
EMP	.789***	.785***	.833***
	(.000)	(.000)	(.000)
FDI	-.004	-.004	-.000
	(.246)	(.256)	(.393)
Trade	.053	.052	.06*
	(.134)	(.140)	(.088)
URB	-.036***	-.036***	-.035***
	(.000)	(.000)	(.000)
Constant	5.569***	5.621***	5.397***
	(.000)	(.000)	(.000)
No. of observations	1012	1012	1012
R-squares	.177	.174	.179
Wald test	208.28***	202.27***	211.17***
	(.000)	(.000)	(.000)
Hausman test	15.31**	16.21**	84.45***
	(.032)	(.023)	(.000)
LM test	7725.94***	7618.83***	7198.99***
	(.000)	(.000)	(.000)

Note(s). GDPPC denotes GDP per capita. BMD represents bond market development. LIP denotes life insurance premium. NLIP denotes non-life insurance premium. TP represents the total insurance premium. GCF denotes gross fixed capital formation. EMP represents employment. FDI denotes foreign direct investment. URB represents urbanization.

Discussion

This study primarily examines the effect of bond and insurance market development on economic growth; however, it also investigates the impact of capital formation, employment, foreign direct investment, trade openness, and urbanization on economic growth by employing a sample of 46 countries worldwide for the period 2000-2021. In line with expectations, the BMD has a significant positive effect on GDP per capita, which supports our proposed hypothesis (H1). This result also supports the "Finance-led Growth Hypothesis". The finding is parallel to the outcomes reported by Pradhan et al. (2019), Pradhan et al. (2020), and Thumrongvit et al. (2013), and in contrast to the outcome reported by Asteriou and Spanos (2019) and Wahidin et al. (2021), especially after the "Global Financial Crisis". This finding suggests that the BMD supply needed long-term capital to entrepreneurs at a lower cost by reducing transaction and monitoring costs, minimizing information asymmetry, and stimulating growth. Additionally, it accelerates job opportunities, which increases individuals' income and demand for goods and services, and stimulates growth via rising outputs to fulfill consumers' demands.

Consistent with our expectations, the IMD has a significant positive effect on GDP per capita, which supports our second hypothesis (H2a, H2b, and H2c). This finding supports the "Financial Intermediation Theory". This result is analogous to outcomes reported by Pradhan et al. (2019), Pradhan et al. (2023), and Imran et al. (2024), and in contrast to the outcome reported by Gracia and Atienza (2025). This outcome signals that, as a financial intermediary, the insurance market channels savings into productive sectors and stimulates growth. It further mitigates risk through risk transfer and motivates entrepreneurs to take more risk and invest in risky projects and innovation, which ultimately increases productivity and efficiency and boosts growth.

In line with the expectation, our results demonstrated that the GCF has a significant positive effect on GDP per capita, which supports our third hypothesis (H3). This also supports "The Neoclassical Growth Model". The result is equivalent to the findings reported by Arabiat (2024) and Uneze (2013), Oyebowale and Algarhi (2020). Nevertheless, this result was not similar to the result reported by Yeboah et al. (2025), especially for the short run. This signals that the investment in physical assets, such as plant and machinery, equipment, and infrastructure, boosts the production capacity, which increases outputs and increases growth. It also supports innovation and increases employment, which ultimately stimulates growth.

As predicted, employment has a significant positive effect on GDP per capita, which supports our fourth hypothesis (H4). This finding also supports Okun's (1962) Law. The result is the same as the findings reported by Banday et al. (2021), Kushwaha and Nair (2025), and Liu et al. (2025), and in contrast to the findings presented by Yeboah et al. (2025), especially in the long run. This supports the view that employment increases the income level of consumers and increases demand for goods and services, which is ultimately fulfilled by producing more goods that stimulate growth. Surprisingly, the FDI has a negligible impact on growth, which does not support "Endogenous Growth Theory". This result is not like the findings presented by Banday et al. (2021), Kushwaha and Nair (2025), Liu et al. (2025), Ogudu et al. (2024), and Yeboah et al. (2025), This implies that the FDI only helps to boost growth; the effectiveness of FDI on growth depends on the human capital development, institutional quality, and domestic innovation capacity.

Surprisingly, trade openness has a negligible impact on GDP per capita, which did not support our fifth hypothesis (H5). This finding did not support the notion of "Trade-led Growth Hypothesis". This finding is in contrast with the empirical findings of Yeboah et al. (2025), Ngoc et al. (2025), Arabiat (2024), Bouattour et al. (2026), and Monyela and Saba (2024). This shows that the influence of trade openness on growth may be influenced by other factors such as institution quality (for instance, regulatory quality, political stability, control of corruption) and excessive trade liberalization. Additionally, trade openness can bring trade deficits, especially in developing countries, which can cause a minimal impact of trade openness on growth. Unexpectedly, the unemployment has a negative effect on GDP per capita, which does not our

final hypothesis. This finding does not support the "Structural Transformation and Urbanization theory". This outcome is in contrast to the results reported by Albanese et al. (2025) and analogous to the outcome reported by Shaban et al. (2024), who stated that the growth stimulates urbanization, but urbanization does not influence growth. This indicates that urbanization is in a saturated stage in the developed world, and a large portion of government funds goes to urban areas to keep up to date by ignoring investment in rural areas, which ultimately leads to decreased growth in the developed world.

Conclusion and Implications

This study primarily investigates the impact of bond market and insurance growth on economic growth, employing the sample of 46 countries for the period 2000-2021. Employing the fixed-effect estimator, the outcome demonstrates, as expected, that BMD has a positive effect on GDP per capita. This suggests that the BMD stimulates growth by efficiently and effectively channeling funds from savers to entrepreneurs that can increase productivity and innovation, which can boost growth. The measures of IMD—LIP, NLIP, and TP—also have a significant positive effect on GDP per capita. This suggests that IMD also efficiently channels funds from policyholders to entrepreneurs. Furthermore, entrepreneurs take more risks for innovation because insurance pools risk, which boosts productivity and efficiency and leads to increased growth.

The finding concludes that gross fixed capital formation and employment have a significant positive effect on GDP per capita. This suggests that an increase in investment in infrastructure and production facilities leads to increased growth. Employment has a positive impact on growth. This suggests that an increase in the employment rate boosts the income level of households, which increases demand for outputs and leads to increased growth. Conversely, FDI and trade openness have a minimal impact on growth. In other words, the influence of FDI and trade on growth is inconclusive. Notably, the unexpected outcome (negative) is found on the impact of urbanization on growth. The negative impact on growth indicates that an increase in urbanization increases the cost of living for urban people and government expenditure to keep cities up to date, which reduces government investment in rural areas, leading to decreased growth.

The favorable impact of BMD and IMD reinforces the two popular theories,"Finance-led Growth Hypothesis" and "Financial Intermediation Theory", that explain that better financial systems are critical drivers of GDP per capita. This suggests that financial market depth and risk management mechanisms could be central in the growth model. The findings also reinforce the two popular theories, "The Neoclassical Growth Model" and Okun's Law, that explain that investment in fixed assets and the proper utilization of the labor force are significant drivers of growth. However, the negative impact of FDI and trade openness refutes the "Trade-led Growth Hypothesis," which suggests that the positive benefits from globalization could be less important due to poor domestic structural factors. The negative effect of urbanization on growth contradicts "Structural Transformation and Urbanization Theory, which suggests the possible issues of urbanization, such as congestion, inequality, or mismanaged urban planning.

The BMD mobilizes long-term financing for infrastructure and industrial projects, and the IMD enhances risk management that stabilizes households and businesses and channels savings into productive investment. The policymakers and practitioners should prioritize strengthening both the bond and insurance markets to achieve the desired growth objective. Furthermore, the effective utilization of capital and labor force strengthens the growth objective. Hence, the policymakers and practitioners should follow strategies that boost GCF and should create more jobs by providing vocational training and labor market reforms. The negligible impact of FDI and trade openness suggests that policymakers could focus on improving domestic absorptive capacity.

Policymaker/s could pay special attention to developing both bond and insurance markets by offering incentives for market participation and regulatory reforms. Similarly, policymaker/s should make efforts to improve the capital formation environment by offering tax incentives and keeping stable macroeconomic

conditions. Policymakers, especially the government, should focus on creating more jobs. The government should revise trade and FDI policies to improve domestic industries. Finally, policymaker/s could pay more attention to developing rural areas (for instance, create more jobs, improve school and health care facilities in rural areas), which can stop migration from rural to urban areas, and limit more rapid urbanization

Limitations and Further Research

This study is based on secondary data, where 46 countries are taken as a sample for the period 2000-2021. It includes high-income (32), upper-middle-income (11), and lower-middle-income (3) countries. The sample of lower-income countries is small compared to high-income and upper-middle-income countries due to the unavailability of data on the study variables. Therefore, future studies could include more low-income countries in the sample. Furthermore, the study incorporated the sample period from 2000 to 2021, and thus, future studies can use a more recent time span with more sample countries. This study did not use dynamic panel data analysis estimators, and results may be biased due to simultaneous causality, omitted variable bias, and measurement errors; therefore, future studies can be done by using dynamic panel data analysis estimators. Future research can be done by using alternative proxies of the variables used in this study and other predictor variables that impact growth.

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Conflict of Interest

The authors declare no conflict of interest.

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Ethical statement

This study relied exclusively on secondary data obtained from publicly available sources and did not involve human participants, personal data collection, or animal subjects. Accordingly, formal ethical approval and informed consent were not required. The research was conducted in accordance with established principles of research ethics, academic integrity, and the responsible use of secondary data.

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