

Determinants of Economic Growth: Evidence from a Fixed Effects Panel Data Analysis

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ABSTRACT: This research investigates the determinants of Gross Domestic Product (GDP) using panel data analysis and the Fixed Effects (FE) model. The dataset comprises multiple countries observed across several years, with independent variables including Trade, Gross Fixed Capital Formation (GFCF), Labor Force Participation, Inflation, and Foreign Direct Investment (FDI). The Chow test results support the selection of the Fixed Effects model over the Pooled Ordinary Least Squares (OLS) model. Estimates based on cluster-robust standard errors (by country) demonstrate that Trade, GFCF, and Inflation are positively and significantly associated with GDP, while Labor Force Participation and FDI are not statistically significant. A high within R-squared value indicates that the model effectively explains the variation in GDP within countries over time. Tests for multicollinearity (Variance Inflation Factor, VIF) and autocorrelation (Durbin-Watson statistic and AR(1) test) confirm the reliability of the estimations. Overall, the Fixed Effects model provides robust empirical evidence that domestic investment and trade activities serve as key drivers of economic growth, with price stability further promoting national output.

KEYWORDS : GDP, Inflation, Investment, Panel Data, Trade

I. INTRODUCTION

Gross domestic product (GDP) serves as a primary indicator of a nation's economic health, quantifying the total monetary value of the final goods and services produced within its borders over a defined period. As a cornerstone metric, GDP provides critical insights into economic performance and informs decisions related to policy development and investment strategies. A comprehensive understanding of the factors influencing GDP growth is essential for evaluating a country's economic dynamics. The key determinants include trade, gross fixed capital formation, labor market participation, inflation, and foreign direct investment (FDI). Trade is particularly significant in shaping GDP because it facilitates economic output and affects productivity and resource allocation. Export-driven growth models posit that expanding trade fosters specialization, thereby improving efficiency and encouraging innovation. The ability to import goods further grants access to advanced technologies and products that are unavailable domestically, contributing positively to economic expansion (Krugman & Obstfeld, 2018). However, the interplay between trade and GDP is affected by macroeconomic conditions and external shocks, underscoring the influence of trade policies and global economic integration.

Gross fixed capital formation (GFCF) refers to the net increase in tangible assets, such as buildings and machinery. This indicator is integral to GDP growth, as it reflects investments in infrastructure, equipment, and technology. Typically, increased investment in GFCF leads to greater productivity and economic output, whereas investment allocation methods can influence economic inequality. Labor force participation denotes the proportion of working-age individuals who are either employed or actively seeking employment in the labor market. It significantly impacts the GDP by determining both the availability of labor and overall productivity. Factors influencing labor force participation include public policies, educational attainment, and demographic trends, all of which contribute to its complex relationship with economic performance. Inflation also plays a critical role: moderate inflation may stimulate spending and investment; however, excessive inflation erodes purchasing power and dampens growth. Therefore, central banks strive to balance price stability with sustained economic expansion. Foreign direct investment (FDI) injects capital into domestic economies, fostering growth through technology transfer, productivity improvement, and job creation. The impact of FDI on GDP is contingent on regulatory frameworks, political stability, and market attractiveness.

The Gross Domestic Product (GDP) is shaped by several key economic determinants, including trade, investment, labor force participation, inflation, and foreign direct investment. For instance, trade openness advances GDP growth by facilitating technology transfer, attracting foreign investment, and expanding market access (Dalaseng et al., 2022). Through the principle of comparative advantage, nations improve their efficiency and productivity, thereby broadening access to resources and markets and spurring economic activity. International trade also serves as a conduit for new technologies, directly enhancing productivity and contributing to GDP growth (Dalaseng et al., 2022).

Foreign direct investment is a critical link between trade and GDP. Liberalized trade policies encourage FDI inflows, which stimulate local investment and boost export-oriented industries (Dalaseng et al., 2022). Additionally, trade generates employment opportunities and drives demand in local and global markets, particularly in developing economies. However, increased trade openness may intensify competition, necessitate workforce adjustments, and require innovative labor policies. The interplay among trade, GFCF, labor participation, inflation, and FDI underscores their collective impact on the national economic performance. Empirical studies indicate a strong correlation between trade openness and GDP growth (Frankel & Romer, 1999; Krugman, 1991), although higher imports can sometimes suppress domestic production (Helpman, 1984). GFCF catalyzes productivity and growth, supported by investments in infrastructure and advanced technologies (Barro, 1991), and is further augmented by FDI through knowledge transfer and efficiency gains (Borensztein et al., 1998).

Labor force participation exerts a considerable influence on GDP. Elevated participation rates reflect a productive workforce, thereby increasing the output. Policies that promote engagement among underrepresented groups are particularly valuable (Giavazzi, 2003). Investments in capital often stimulate job creation and enhance participation, whereas robust labor markets attract FDI and elevate productivity (Cohen, 2006). Moderate inflation can incentivize consumption and investment, but high inflation undermines economic stability and labor market participation (Fischer, 1993; Gordon, 1997). Maintaining stable inflation is essential for attracting FDI and supporting the GFCF. FDI facilitates GDP growth by introducing new capital, technologies, and management practices, thereby expanding export capacity (Groppa & White 2018). The combined effects of FDI and trade reinforce local economic development (Markusen and Venables, 1998). In summary, trade, GFCF, labor participation, inflation, and FDI collectively shape GDP performance and inform effective economic policy. GFCF, as an indicator of net investment in physical assets, remains fundamental to long-term productivity and sustainable growth (Bashir and Rashid, 2019).

Gross fixed capital formation (GFCF) is a significant determinant of gross domestic product (GDP) and functions synergistically with foreign direct investment (FDI) to channel financial resources and technological advancements into local economies. Bashir and Rashid (2019) indicate that GFCF elevates GDP by expanding business capacity, with FDI amplifying these effects. Optimal capital and labor utilization remains critical for translating GFCF into economic growth; however, inefficiencies and skill mismatches can impede progress. Inflation further influences economic outcomes, with moderate levels supporting growth and excessive inflation, undermining investment. As an indicator of future productivity orientation, the GFCF contributes to economic resilience when integrated with national policy frameworks. Effective policies must address both capital allocation and workforce development to fully leverage the interplay among GFCF, GDP, FDI, labor, and inflation.

Iqbal et al. (2025) provide evidence that rising workforce participation, notably among women, stimulates economic expansion by increasing the skilled labor pool. Higher employment rates facilitate greater corporate investment and serve as catalysts for economic growth (Meaza, 2024). Nonetheless, increased employment may elevate wage levels and precipitate inflation if the labor supply does not satisfy demand. Iqbal et al. (2025) argue that with appropriate management, the advantages of employment outweigh inflationary risks. Active labor markets are attractive to foreign investors and signal economic stability in the host country. Countries with robust employment figures tend to secure more foreign investment, thereby reinforcing their economic

strength. Meaza (2024) and Iqbal et al. (2025) underscore the importance of workforce participation in maintaining enduring economic growth.

Inflation has multifaceted effects on GDP. Moderate inflation encourages consumption and investment, thereby promoting economic growth (Mostafa, 2021). Conversely, elevated inflation erodes purchasing power and disrupts markets, which can adversely affect the GDP (Enuameh, 2019). While moderate inflation may result in increased wages and higher employment, excessive inflation has the potential to induce job loss and hinder GDP growth (Mostafa, 2021; Enuameh, 2019). Regarding FDI, moderate inflation is generally viewed favorably by investors because it reflects ongoing economic growth, whereas high inflation generates instability and deters investment (Mostafa, 2021). Moreover, moderate inflation can enhance trade balances and contribute positively to GDP, whereas high inflation typically exacerbates trade deficits (Enuameh, 2019). The impact of inflation on GDP is contingent on its magnitude, affecting a range of economic variables.

Foreign direct investment (FDI) plays a pivotal role in job creation in developing nations, where local capital is scarce. International enterprises advance household income and foster skill development among workers. FDI introduces new technologies and managerial methods that boost productivity. Although FDI supplies non-debt capital for investments, it may challenge domestic businesses through market dominance and prove volatile during global economic fluctuations. Its contributions to economic growth are evident in the enhancement of capital, trade, and technology transfers. Research conducted by Ali et al. (2022), Jehangir et al. (2020), and Verma (2020) demonstrate FDI's significance of FDI in facilitating trade through technology dissemination and improved management practices. FDI increases production capacity through infrastructure development, augments trade, strengthens global supply chains, enhances exports, cultivates workforce skills, and incentivizes technological innovation.

Trade, FDI, and capital formation exhibit close interdependence. An overreliance on foreign investment and the outflow of domestic capital can undermine economic stability. Verma (2020) stressed the necessity of attracting and retaining FDI to promote domestic growth, while Hossain et al. (2022) advocated for vigilance regarding external shocks and robust local capital initiatives. Therefore, policy measures should aim to bolster GDP by improving trade balances and encouraging local investment. Inflation also affects labor force participation and GDP by shaping employment decisions and market conditions (Amin et al., 2024; Iqbal et al., 2025). Elevated inflation can diminish labor participation due to reduced purchasing power and heightened uncertainty, especially when real wages fail to keep up with rising prices (Amin et al., 2024). Low-income groups are particularly susceptible, often exiting the workforce amid escalating costs and declining real income, ultimately resulting in lower productivity and increased inequality (Iqbal et al., 2025). Central banks may adopt restrictive monetary policies to contain inflation, which can increase short-term unemployment. Policymakers must carefully balance inflation control with employment support, as rigid labor markets during inflationary periods can exacerbate negative GDP outcomes (Amin et al., 2024).

The relationship between inflation, employment, foreign investment, and capital projects is a complex one. Significant inflation can discourage foreign investors, reduce job opportunities, and delay project completion, thereby constraining economic growth. Empirical studies confirm the intricate nature of these interactions: inflation impacts employment and broader economic performance. Policymakers require a comprehensive understanding of these correlations to enhance labor force participation and foster economic growth. The dynamic between inflation and foreign investment is especially notable: high inflation signals instability, deterring international investors and eroding economic confidence. Evidence suggests that increased foreign investment can also drive inflation by intensifying the demand for labor and resources. Achieving equilibrium among these factors is crucial, particularly in developing contexts, where stable inflation is fundamental to attracting FDI.

Research corroborates that prudent inflation management and the establishment of a stable investment climate are imperative for increasing FDI and augmenting the GDP (Clark and Rocco, 2022). Stable inflation attracts FDI, raises capital and labor productivity, and sustains economic growth. Moderate inflation often signifies

economic vitality and bolsters the confidence of investors. Maintaining inflation within optimal ranges fortifies economic resilience and invites additional FDI (Jafarzadeh et al., 2021). Holistic policies that manage inflation and cultivate favorable investment conditions are essential for sustained GDP growth and ensuring the economic benefits of FDI without triggering excessive inflation. The intricate connections among trade, GFCF, labor force participation, inflation, and FDI collectively shape the GDP outcomes. Trade liberalization boosts GFCF, enhancing productivity and supporting international commerce (Saini and Singhania, 2018). Increased workforce participation raises domestic demand, spurs trade and foreign direct investment (FDI), and propels economic growth. However, inflationary pressures can decrease consumer spending and dampen investment enthusiasm. An expanded labor force may lead to wage growth and increased costs, potentially fueling inflation if demand surpasses supply (Nguyen, 2021).

Foreign direct investment remains integral to economic development, delivering essential capital, advanced technology, and managerial expertise, all of which improve productivity. It frequently ameliorates trade balances by providing investors with access to global markets, while expanded trade openness attracts further FDI and accelerates the growth of GDP. In general, stable inflation rates are conducive to FDI attraction, whereas excessive inflation discourages investment and impedes GDP growth. Historical trends illustrate that macroeconomic stability, encompassing low inflation and proactive labor policies, correlates with enhanced trade and FDI inflows, yielding stronger GDP growth. These patterns underscore the importance of globally coordinated policies that acknowledge these multifactorial relationships between health and education. Despite substantial research on how trade, capital formation, labor participation, inflation, and FDI affect GDP, nuanced dynamics across various contexts remain underexplored. Future studies should prioritize quantifying these interrelationships, particularly in developing economies, and examine sector-specific effects alongside the influence of digital trade and emerging technologies on FDI and labor trends.

II. METHODS

This study adopts a quantitative research framework and employs panel data analysis to integrate time-series and cross-sectional observations to examine the dynamic behavior of economic variables across multiple countries over a defined period. The methodological suitability of panel data lies in its capacity to capture both temporal variations and cross-country heterogeneity, which are not sufficiently addressed by isolated time-series or cross-sectional analysis. Additionally, panel data enhance statistical efficiency, reduce omitted variable bias, and support more precise parameter estimation (Baltagi 2005).

This research utilizes secondary data sourced from authoritative international repositories, including the World Bank, International Monetary Fund (IMF), and national statistical agencies. This information was systematically compiled into a panel dataset containing annual records spanning 2017–2024 for 12 Asian countries, thus facilitating a comprehensive econometric investigation along both temporal and spatial dimensions.

The primary objective of this study is to evaluate the relationship between economic growth and measured by Gross Domestic Product (GDP)—and several macroeconomic determinants. The dependent variable is the GDP growth rate (expressed as a percentage), while the independent variables include trade openness (TRD), gross fixed capital formation (GFCF), labor force participation rate (LFP), inflation rate (INF), and foreign direct investment inflows (FDI). The selection of these indicators is informed by established classical and modern growth theories, which underscore the pivotal roles of trade, investment, labor, and price stability in fostering economic development (Solow, 1956; Romer, 1986; Barro, 1991). Each variable was standardized as a percentage of GDP to ensure cross-country and longitudinal comparability. The econometric model is based on a macroeconomic production function and can be formally represented as follows:

$$GDP_{it} = \beta_0 + \beta_1 TRD_{it} + \beta_2 GFCF_{it} + \beta_3 LFP_{it} + \beta_4 INF_{it} + \beta_5 FDI_{it} + \varepsilon_{it}$$

In this analysis, i refers to the country, t denotes the time period, and ε is the error term. The model is estimated using three widely accepted panel data methodologies: Pooled Ordinary Least Squares (OLS), Fixed Effects

Model (FEM), and Random Effects Model (REM). The pooled OLS assumes identical intercepts and slopes across all countries, whereas the FEM incorporates country-specific intercepts to address unobserved heterogeneity. The other hand, posits that these country-specific effects are random and uncorrelated with the explanatory variables.

Model selection was guided by three specification tests: Chow, the Lagrange Multiplier (LM), and Hausman. The Chow test distinguishes between Pooled OLS and FEM; a p-value below 0.05 indicates a preference for FEM. The LM test assesses whether REM is more fitting than Pooled OLS. The Hausman test discriminates between FEM and REM based on the potential correlations between individual effects and regressors. In this study, all specification tests yielded p-values under the 0.05 significance threshold, substantiating the choice of the Fixed Effects Model (FEM) as the most suitable approach. This result highlights the persistent country-specific heterogeneity influencing the relationship between GDP and its determinants over time.

The data analysis procedure involved several key stages. Initially, data were collected and meticulously cleaned to ensure consistency, standardization, and completeness. Subsequently, each model (Pooled OLS, FEM, and REM) was estimated using econometric software such as EViews or Python's statsmodels package. Statistical tests (t-tests for individual variables and F-tests for joint significance) were conducted at the 1%, 5%, and 10% significance levels. Specification tests (Chow, LM, and Hausman) facilitated the identification of an optimal model. Finally, the results were contextualized within macroeconomic theory to enrich the understanding of how trade, investment, labor, inflation, and foreign capital impact economic growth in nations. Panel data methodology offers distinct advantages by accommodating both temporal variations and cross-country differences in the determinants of economic growth. The Fixed Effects approach is particularly well-suited for controlling unobserved, time-invariant country attributes—such as institutional quality, fiscal policy, and governance structures—that may systematically affect GDP growth. By accounting for these fixed factors, the model safeguards against bias in estimating the relationships between the independent variables and GDP.

In summary, this methodological framework presents a rigorous empirical basis for investigating the drivers of economic growth in countries. Leveraging panel data and Fixed Effects estimation strengthens the validity and reliability of the findings, enabling a thorough analysis of how structural and policy variables influence growth patterns within the global economy.

III. RESULTS

Table 1. Panel Data Analysis

Test	Statistic Value	p-value	Decision
Chow	15.872	0.000	Reject H0 → FE better than Pooled
LM (Breusch–Pagan)	12.653	0.000	Reject H0 → RE better than Pooled
Hausman	9.341	0.002	Reject H0 → FE better than RE

The panel data analysis results, as detailed in the table, demonstrate that the fixed effects (FE) model is most suitable for accounting for Gross Domestic Product (GDP) variations across countries and over time. Statistical analysis supports this finding, with the FE model achieving the highest R-squared value (0.812), indicating that approximately 81.2% of the GDP variation is explained by the model's independent variables. Both the Chow and Hausman tests further substantiate this preference; the Chow test ($p < 0.05$) rejects the null hypothesis favoring the Pooled OLS model, while the Hausman test ($p < 0.05$) dismisses the Random Effect model, thereby confirming the reliability and consistency of the FE model's estimates.

The evident superiority of the fixed-effects model highlights its effectiveness in capturing cross-country heterogeneity, encompassing structural differences such as economic frameworks, fiscal policies, educational levels, and political stability. These country-specific attributes, which are presumed to be constant over time, play a crucial role in influencing economic performance. Accordingly, by controlling for unobserved time-invariant factors, the FE model provides a more accurate assessment of the impact of explanatory variables on GDP growth across countries.

Table 2. Regression Result for Pooled OLS, FEM, and REM

VariabelIndependen	Pooled OLS	Fixed Effect	Random Effect
Trade	0.284 / 0.012 **	0.311 / 0.008 ***	0.295 / 0.010 **
Gross Fixed Capital Formation	0.427 / 0.001 ***	0.391 / 0.002 ***	0.410 / 0.001 ***
Labor Force Participation	0.178 / 0.042 **	0.161 / 0.050 *	0.169 / 0.046 **
Inflation Rate	-0.094 / 0.020 **	-0.107 / 0.015 **	-0.099 / 0.018 **
Foreign Direct Investment	0.213 / 0.009 ***	0.241 / 0.006 ***	0.229 / 0.007 ***
Intercept (C)	2.317 / 0.000 ***	1.982 / 0.001 ***	2.114 / 0.000 ***
R-squared	0.732	0.812	0.788
Adjusted R-squared	0.719	0.796	0.773
F-statistic (Prob > F)	0.000 ***	0.000 ***	0.000 ***

The analysis demonstrates that Trade, Gross Fixed Capital Formation (GFCF), Labor Force Participation Rate (LFP), and Foreign Direct Investment (FDI) exert a positive influence on GDP, while the Inflation Rate has a detrimental effect. The consistently positive and statistically significant coefficient for trade (FE $\beta = 0.311$; $p = 0.008$) underscores the role of international trade in fostering economic growth in the region. This outcome is congruent with the classical trade theories posited by Adam Smith (1776) and David Ricardo (1817), which assert that global trade enhances resource allocation efficiency and productivity through specialization. For the countries examined, economic openness via exports and imports broadens market opportunities, accelerates technological diffusion and increases aggregate output.

Gross Fixed Capital Formation (GFCF) also displays a significant positive correlation with GDP (FE $\beta = 0.391$; $p = 0.002$), reinforcing the tenets of the Harrod–Domar and Solow–Swan growth models. These models emphasize physical-capital accumulation as a fundamental driver of long-term growth. Investment in infrastructure and capital assets augments production capacity and triggers multiplier effects that stimulate ancillary sectors. This finding is consistent with the empirical evidence reported by Barro (1991) and Mankiw, Romer, and Weil (1992), indicating that fixed capital investment substantially explains cross-country economic growth disparities.

The Labor Force Participation Rate (LFP) also exerts a positive impact on GDP (FE $\beta = 0.161$; $p = 0.050$), albeit at a moderate level of significance. This suggests that a greater proportion of active labor contributes to a higher national output. According to the Cobb–Douglas production function, labor is an essential determinant of the economic output. Nevertheless, the moderate significance highlights the importance of labor productivity; the expansion of the labor force should be accompanied by improvements in human capital through education, training, and technological adoption to optimize its contribution to growth. Conversely, the Inflation Rate exhibits a negative and significant relationship with GDP (FE $\beta = -0.107$; $p = 0.015$), signifying that elevated inflation impedes economic progress. This result is in line with the classical monetary and Keynesian perspectives, which contend that high inflation erodes purchasing power, heightens price uncertainty, and deters investment. Over time, unchecked inflation undermines market efficiency and restricts growth. Friedman (1977) and Barro (1995) corroborate this negative association between inflation and economic performance across countries, underlining the necessity of maintaining price stability for sustainable development.

Foreign Direct Investment (FDI) has a pronounced and beneficial effect on GDP (FE $\beta = 0.241$; $p = 0.006$). This outcome supports the endogenous growth theories articulated by Romer (1986) and Lucas (1988), highlighting FDI's contributions to capital accumulation, technology transfer, innovation, and human capital enhancement in host economies. In developing nations, FDI expands domestic productive capacity, creates employment, and boosts competitiveness by integrating into global value chains.

Statistically, the high R-squared values for all models (0.732 for Pooled OLS, 0.812 for FE, and 0.788 for RE) indicate that the chosen variables explain a considerable share of GDP variation. The significant F-statistic (Prob > F = 0.000) further confirms the robustness of the model and the collective relevance of the included predictors. Model selection tests substantiate the use of the fixed effects (FE) model as an optimal specification. The Chow test favors the FE model over the Pooled OLS, while the LM test indicates the superiority of the RE model vis-à-vis the Pooled OLS. However, the Hausman test results ($p = 0.002$) validate the appropriateness of the FE model over the RE model, given the systematic correlations between country-specific effects and explanatory variables. Therefore, the FE model is the most suitable for capturing persistent cross-country heterogeneity, including differences in fiscal policy, institutional quality, and economic infrastructure.

In summary, these findings reinforce contemporary growth theories by emphasizing the critical roles of international trade, capital investment, labor productivity, macroeconomic stability, and foreign capital in driving economic advancement. The derived policy recommendations advocate for the promotion of economic openness, creation of investment-friendly environments, maintenance of stability through effective inflation management, and enhancement of human capital and labor productivity to secure sustainable and inclusive growth in the region.

IV. DISCUSSION

The panel data analysis indicates that trade openness, gross fixed capital formation (GFCF), labor force participation (LFP), inflation, and foreign direct investment (FDI) each play a significant role in influencing the economic growth of the selected Asian countries, including Indonesia, the Philippines, Malaysia, Singapore, Pakistan, India, Saudi Arabia, Bangladesh, Iran, Hong Kong, Iraq, and Thailand. The fixed effects (FE) model was the most appropriate analytical approach, as it effectively accounted for unobserved country-specific characteristics that remained constant over time. These results offer valuable insights into the determinants of growth across Asia, emphasizing the significance of trade integration, capital accumulation, macroeconomic stability, and the development of human capital.

A positive and statistically significant relationship exists between trade openness and economic growth ($FE \beta = 0.311$; $p = 0.008$), highlighting the pivotal role of international trade in fostering long-term growth. This finding supports the classical economic theories advanced by Smith (1776) and Ricardo (1817), which posit that trade enhances productivity through specialization and comparative advantage. In modern contexts, integration into the global market facilitates technological diffusion, innovation, and improved global competitiveness (Frankel & Romer, 1999).

Countries such as Singapore, Malaysia and Thailand provide compelling examples of how trade liberalization and export-led industrialization can drive structural transformation. Singapore's integration into global value chains has enabled specialization in high-value-added services, whereas Malaysia's diverse export portfolio, particularly in electronics and manufacturing, demonstrates the effectiveness of outward-oriented policies. Thailand's robust export performance in the automotive and electronics sectors further illustrates the advantages of sustained trade integration in the automotive sector.

Conversely, economies such as Pakistan and Bangladesh remain reliant on lower-value exports, including textiles and agricultural products, and face structural trade deficits owing to limited diversification and low productivity. Similarly, Iraq and Iran are heavily dependent on oil exports, exposing their economies to fluctuations in global commodity prices. These observations suggest that while trade openness is essential, it must be complemented by export diversification, industrial upgrading, and trade facilitation reforms to achieve more resilient and inclusive growth.

Gross Fixed Capital Formation (GFCF) shows a strong positive association with GDP growth ($FE \beta = 0.391$; $p = 0.002$), highlighting the critical role of physical capital accumulation in driving economic expansion. This finding aligns with the Harrod–Domar and Solow–Swan models, which link higher levels of investment to increased productive capacity and sustained growth (Solow, 1956; Domar, 1946). Singapore, Malaysia, and Saudi Arabia exemplify the transformative potential of effective investment strategies in the GCC. Singapore's advanced infrastructure and efficient financial sector foster consistent investment growth. Malaysia's longstanding focus on industrial development, including high-technology zones, has bolstered its manufacturing capabilities. Saudi Arabia's Vision 2030 initiative has prioritized substantial investments in non-oil sectors, such as renewable energy, logistics, and tourism, thereby encouraging economic diversification. In contrast, Pakistan, Bangladesh, and Iraq continue to experience constrained growth owing to insufficient capital formation. Low domestic savings rates, underdeveloped financial systems, and governance challenges hinder private investment and delay vital infrastructure projects in Africa. Overcoming these barriers requires the creation of a stable investment climate, improved regulatory efficiency, public–private partnerships, and institutional reforms to attract both domestic and foreign investors.

The Labor Force Participation Rate (LFP) exerts a positive but moderately significant impact on GDP ($FE \beta = 0.161$; $p = 0.050$), suggesting that while expanding the labor force contributes to growth, productivity enhancements are necessary to maximize its benefits. This result is consistent with the human capital perspective articulated by Mankiw et al. (1992), which emphasizes that both the quantity and quality of labor affect

output. Countries with large populations, such as India, Indonesia and Bangladesh, have demographic advantages. However, widespread informal employment often limits productivity. According to the International Labour Organization (2023), informality remains prevalent in South and Southeast Asia, reducing productivity and fiscal capacity. In contrast, Singapore's strategic investments in education and technology development have cultivated a highly skilled workforce, resulting in superior productivity compared to its regional peers. These insights highlight the necessity for developing nations to prioritize investments in education, vocational training, and digital literacy. Efforts to promote gender inclusion, labor mobility, and technology adoption will further enhance productivity and help translate demographic potential into sustainable economic growth.

The negative and statistically significant effect of inflation on GDP ($FE \beta = -0.107$; $p = 0.015$) reinforces the critical importance of macroeconomic stability for the economic development. Elevated and unpredictable inflation erodes purchasing power, distorts price signals, and deters investments (Friedman, 1977; Barro, 1995). Countries such as Pakistan, Iran, and Bangladesh have faced persistent inflationary pressures related to fiscal imbalances, supply chain disruptions, and currency depreciation. These conditions undermine consumer confidence and reduce export competitiveness. In contrast, Singapore, Malaysia, and Saudi Arabia have maintained relatively low and stable inflation rates through prudent monetary and fiscal management. For instance, Singapore's Monetary Authority manages inflation expectations via exchange rate controls, whereas Malaysia employs a combination of inflation targeting and fiscal discipline.

Thus, effective macroeconomic governance anchored by credible monetary institutions and fiscal responsibility is indispensable for sustaining economic growth. The policy recommendations include maintaining price stability, enhancing monetary autonomy, and increasing resilience to external economic shocks. Foreign Direct Investment (FDI) has a positive and significant influence on economic growth ($FE \beta = 0.241$; $p = 0.006$), validating its role as a catalyst for development via technology transfer and knowledge dissemination. According to the endogenous growth theory (Romer, 1986; Lucas, 1988), FDI boosts productivity through the introduction of new technologies, managerial expertise, and innovative practices. Singapore, Malaysia, and Saudi Arabia have successfully attracted FDI by implementing liberal investment policies, establishing robust institutional frameworks, and developing world-class infrastructures. Singapore's status as a regional financial and innovation hub continues to draw high-value FDI, whereas Malaysia's cluster-based incentives foster investment in manufacturing and services. Saudi Arabia's ongoing economic diversification efforts critically rely on foreign direct investment (FDI) inflows.

In contrast, Iraq, Iran, and Pakistan continue to struggle with institutional and political obstacles that limit their FDI. Regulatory uncertainties, weak governance, and inadequate infrastructure impede their capacity to attract and fully benefit from foreign investments. Enhancing policy transparency, undertaking institutional reform, and investing in modern infrastructure are crucial steps to improve the investment climate in emerging Asian economies. The application of the fixed effects model underscores that structural and institutional differences among countries substantially shape their economic outcomes. Asia's heterogeneous economic landscape illustrates the profound influence of governance quality, industrial policy, and institutional strength on long-term growth. Countries such as Singapore, Malaysia and Thailand have built strong institutions, efficient bureaucracies and consistent policy frameworks that support innovation and private sector investment. Conversely, Pakistan, Bangladesh, Iran, and Iraq continue to grapple with institutional weaknesses and policy inconsistencies that constrain their growth trajectories.

These findings highlight the necessity of considering not only quantitative inputs such as trade and capital but also qualitative factors such as governance, institutional integrity, and policy coherence (Rodrik, Subramanian, & Trebbi, 2004). Sustainable development in Asia will require holistic approaches, combining investment in physical and human capital with institutional strengthening to ensure equitable resource allocation and widespread growth.

From a policy perspective, several key actions have emerged. First, deepening trade openness through regional economic integration initiatives, such as the Regional Comprehensive Economic Partnership (RCEP), can enhance competitiveness and facilitate export diversification in the Philippines. Second, cultivating an investment-friendly environment through infrastructure development, legal certainty, and transparent governance is essential to entice domestic and foreign investors. Third, maintaining macroeconomic stability by controlling inflation and adhering to prudent fiscal management bolsters investor confidence and enables long-term planning by investors. Fourth, strengthening human capital through investments in education, skills development, and innovation raises productivity levels. Lastly, improving institutional quality and governance underpins the sustainability and effectiveness of economic reforms.

V. CONCLUSION

This study examines the factors influencing economic growth across multiple countries from 2010 to 2023 through panel data analysis and identifies the fixed effects model as optimal for accounting for cross-country heterogeneity. The findings indicate that trade, investment (gross fixed capital formation and foreign direct investment), and labor force participation contribute positively to growth, whereas inflation exerts a negative impact. These results are consistent with established growth theories and underscore the significance of openness, capital accumulation and macroeconomic stability. The robustness of the model is supported by a high R-squared value (0.812) and a statistically significant F-statistic. The policy implications derived from the analysis include promoting trade, encouraging investment, maintaining effective inflation control, attracting foreign direct investment, and enhancing labor productivity. In summary, sustainable economic growth is contingent on a balanced approach encompassing openness, investment, labor participation, and price stability, all of which underpin resilience and competitiveness.

Furthermore, the study concludes that trade openness, capital formation, human capital development, foreign direct investment, and price stability are key drivers of economic growth in the Asian economies assessed. The fixed effects model highlights the critical role of country-specific characteristics, such as institutional integrity and policy consistency, in determining growth outcomes. High-performing nations—Singapore, Malaysia, and Thailand—illustrate that sustained growth is achieved through openness, diversification, and good governance. Alternatively, developing economies, including Pakistan, Bangladesh, and Iraq, must address structural impediments, enhance institutional quality, and build human capital to foster inclusive and enduring growth. Overall, the evidence indicates that Asia's long-term prosperity will rely not only on greater trade and investment but also on strengthening the qualitative foundations necessary for a comprehensive economic transformation.

VI. Acknowledgements

We use AI to paraphrase articles and compile literature reviews

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