

The Relationship Between Macroeconomic Variables and Economic Growth: A Research on Upper Middle Income Economies

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Abstract

This research delves into an extensive examination of the influence of Foreign Direct Investments (FDI), exports, tax revenues, domestic savings, and the labor force on the economic growth trajectories of 20 upper-middle-income economies. Spanning the period from 1990 to 2021, data sourced from the World Bank database were meticulously analyzed. Findings indicate that FDI, tax revenues, domestic savings, and the labor force exhibit predominantly positive impacts on economic growth, with FDI emerging as a significant driver due to its role in technology transfer, workforce training, and job creation. Tax revenues contribute to public service financing and economic stability, while domestic savings foster new businesses and infrastructure development. A growing labor force, coupled with enhanced productivity, stimulates innovation and economic growth. Surprisingly, exports display a modestly negative impact on growth, suggesting limited influence from external demand fluctuations. Policy recommendations include improving investment environments, fostering competitiveness in exports, efficient tax policies, incentivizing savings, and investing in education and skill development programs. Tailoring these recommendations to individual country contexts is crucial for sustainable economic growth. The novelty of this study lies in its exploration of these variables as a cohesive set for this group of nations, which has not been previously examined.

Introduction

Economic growth stands as a pivotal element that contributes to a nation's affluence and plays an essential role in fostering sustainable development. The comprehension of global economic growth dynamics

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and the identification of influential factors constitute primary obligations for economists and policymakers alike. In this context, the examination of how macroeconomic variables impact economic growth lies at the core of contemporary economic theory.

Economic growth, by definition, entails an escalation in a nation's Gross Domestic Product (GDP). This upswing is typically quantified by evaluating the expansion of economic endeavors within a specific time frame, leading to increased production of goods and services. The ramifications of economic growth extend to the reduction of unemployment rates, the mitigation of poverty, and the improvement of living standards. However, it is imperative for this growth trajectory to adhere to principles of sustainability, given that factors like the excessive depletion of resources and environmental concerns can imperil future generations.

Several factors exert influence on economic growth, and these factors engage in intricate interplay. This research endeavors to explore the fundamental determinants of economic growth, encompassing variables such as foreign direct investment, exports, tax revenues, domestic savings, and the labor force.

1.1. The Relationship Between Foreign Direct Investments and Economic Growth

Foreign Direct Investment (FDI) refers to the direct allocation of capital or assets by entities or individuals from one country into businesses situated in another nation, in which they do not reside. Such investments often bestow control over businesses outside the investing nation's borders. Typically, foreign investors either establish novel enterprises or acquire ownership shares in pre-existing ones. FDI represents a long-term commitment and holds the potential to facilitate the transfer of technology, job creation, and the fostering of local economic expansion (Wasnik and Sarraf, 2023).

The correlation between FDI and economic growth is intricate, encompassing multifarious factors. Nonetheless, some essential manners in which FDI might impact economic growth can be delineated as follows:

FDI can contribute to heightened operational efficiency among businesses, fostering the implementation of advanced technology and superior business procedures (Sugiharti et al., 2022). This, in turn, can stimulate enhanced productivity and ultimately lead to economic growth.

FDI has the potential to usher in fresh employment prospects for the local labor force (Hayat and Idrees, 2022), thus contributing to a reduction in unemployment rates and bolstering consumer expenditure.

FDI empowers a nation to partake more extensively in the global supply chain, potentially bolstering its potential for exports and exerting a favorable influence on its trade equilibrium (Ogunjobi et al., 2023).

FDI furnishes several noteworthy advantages for countries, including the transference of technology (Erdoğan, 2023), employment generation (Appiah et al., 2023), economic expansion (Hamid et al., 2023), and the accrual of foreign exchange earnings (Sokhanvar and Jenkins, 2022). Overseas corporations can impart new technologies, management methodologies, and business practices to indigenous enterprises, amplifying their competitive prowess. Additionally, FDI augments the local economy by engendering fresh employment opportunities. Furthermore, FDI can expedite the progression of local economies and augment a nation's Gross Domestic Product. Moreover, foreign investment can yield foreign exchange inflows, augmenting a nation's effectiveness in the realm of international trade.

The ramifications of FDI on economies characterized by elevated middle-income levels frequently hinge on their capacity to allure increased capital and facilitate the transmission of technology. These economies may possess an enhanced potential to engender employment opportunities and adopt technological advancements. However, the influence of FDI on economic growth is contingent upon interactions with various other variables, manifesting different outcomes from one nation to another.

In summation, FDI emerges as a substantial catalyst for economic growth; nevertheless, its effects can fluctuate between nations, and favorable results can be realized through well-crafted policies. Consequently, the comprehension and adept management of FDI's consequences are of paramount significance, particularly for economies residing within the middle-income tier.

1.2. The Relationship Between Export and Economic Growth

Exporting refers to the process of marketing and selling a nation's goods and services in foreign countries, essentially involving the shipment of products or services across a nation's borders (Faisal, 2022). Exporting plays a pivotal role in shaping a nation's international trade and its global economic interactions.

Exporting holds the capacity to enable a nation to amass foreign currency earnings by trading its goods and services on the global stage (Can et al., 2023). This influx of foreign exchange revenue serves as a pillar supporting domestic demand and holds the potential to augment the nation's overall

income. By venturing into exporting, a nation can foster economic growth, introducing an additional stream of income into its domestic economic landscape. Moreover, it can diminish the nation's reliance on its domestic market, bolstering resilience against external economic shocks and diversifying risks, all while nurturing sustained economic expansion. The process of producing goods and services for exportation creates fresh opportunities for local enterprises and can lead to increased employment rates (Harun and Laksito, 2022). This uptick in employment can subsequently stimulate higher levels of consumer expenditure, further fortifying economic growth. Through exporting endeavors, local businesses can gain insights into international production standards, methodologies, and technologies, thereby amplifying local productivity and triggering economic expansion.

The significance of exporting to economies can be encapsulated through several lenses: Exporting empowers a nation to accumulate foreign currencies, which can be channeled into import payments and foreign exchange reserves (Sera and Wodajo, 2023). The pursuit of exporting can incentivize a nation to present its products and services competitively on the global market, catalyzing local businesses to become more proficient and innovative (Muñoz et al., 2022). Exporting acts as a catalyst for economic growth, elevating national income and, ultimately, elevating the living standards within the nation (Rehman et al., 2023).

For economies perched at a high middle-income level, the impacts of exporting tend to manifest in the ensuing ways: Economies boasting a high middle-income status are positioned to offer a more extensive array of products and services to foreign markets through their exporting endeavors. This diversification can generate greater foreign exchange income and bolster national reserves. Such economies possess the wherewithal to embark on increased investments and spearhead technological advancements, thereby fostering innovation and bolstering competitiveness. Exporting ushers in a realm of growth prospects for local enterprises, nurturing employment expansion, ultimately elevating per capita income, and advancing economic growth.

In conclusion, the role of exporting is of paramount significance for economies perched at a high middle-income level and can prove instrumental in underpinning sustainable growth for these nations.

1.3. The Relationship Between Tax Revenues and Economic Growth

Tax revenues denote the aggregate sum of taxes gathered by a government from its populace and business entities (Alexi et al., 2023). This financial

reservoir typically encompasses a multitude of revenue streams, including income taxation, corporate levies, value-added taxes (VAT), tariffs on imported goods and services, property assessments, and excise impositions, among others. These financial inflows play a pivotal role in enabling a government to underwrite its public expenditures and furnish indispensable governmental services (Terman, 2023).

The interplay between tax revenues and economic growth is intricate, influenced by a myriad of variables. Nevertheless, the fundamental tenets characterizing this nexus can be encapsulated as follows: Tax revenues provide a financial backbone for a government's public spending initiatives, which encompass endeavors that invigorate economic expansion, such as infrastructural development (Mishra, 2023), educational enhancements (Mpofu, 2022), healthcare provisions (Liu et al., 2023), and social welfare programs (Amaglobeli et al., 2022). Tax revenues offer the fiscal backing necessary to sustain unemployment relief programs (Iswahyuni and Efendi, 2022), health insurance coverage (Hsiao and Yip, 2023), and various social safety nets, thereby contributing to economic growth by fortifying the labor market (Kakwani et al., 2023). Furthermore, tax revenues bestow upon a government the capacity to uphold economic stability, as tax policies can be adroitly leveraged to stimulate or recalibrate the economy during periods of economic turbulence or contraction.

The significance of tax revenues in the context of national economies is underscored by several salient considerations: Tax revenues serve as the financial bedrock that sustains an array of public amenities, spanning from educational services and healthcare provisions to public safety initiatives and infrastructure enhancements. Tax policies, when deftly crafted, can be harnessed to spur or harmonize economic growth; for instance, tax concessions or incentives can incentivize heightened corporate investments (Evans and Joseph, 2022). Moreover, tax revenues can be marshaled to buttress principles of social equity and mitigate income disparities, fostering a more equitably distributed societal dividend (Seven, 2023).

In economies characterized by a high middle-income status, the ramifications of tax revenues often find expression through the ensuing conduits: These economies, owing to their augmented tax revenue streams, frequently exhibit the capacity to furnish a more expansive and superior cadre of public services. This, in turn, can catalyze the maturation of human capital and buttress economic growth. The ample tax revenues at their disposal empower these economies to channel resources into the cultivation of human capital, encompassing facets such as workforce education, skill amplification,

and employment promotion programs, ultimately culminating in heightened labor productivity. These economies have the latitude to contrive tax policies engineered to invigorate economic growth, with a pronounced emphasis on incentivizing corporate investments.

In conclusion, the impact of tax revenues on high middle-income economies may fluctuate contingent on their adaptability to policy shifts and the scale of available resources. Nevertheless, these revenues invariably harbor the potential to stimulate economic growth, bearing testament to their centrality in the fiscal landscape.

1.4. The Relationship Between Gross Domestic Savings and Economic Growth

Gross Domestic savings encompass the portion of income accrued by a nation's populace and business entities within a specific timeframe that is earmarked for purposes other than immediate consumption (Ali, 2020). Rather than being spent, these savings are channeled towards future investments or reserved for forthcoming needs, serving as a vital financial resource.

The interplay between domestic savings and economic growth is intricate but can be delineated through the following mechanisms: Domestic savings can underwrite businesses' acquisition of novel technologies, machinery, and infrastructural assets, thereby augmenting operational efficiency and kindling the flames of economic growth (Porter and Van der Linde, 1995). Moreover, domestic savings can mitigate a nation's reliance on external sources of financing, fostering economic resilience in the face of external perturbations (Schembri, 2008). These savings can serve as a catalyst for capital accumulation, ultimately bolstering productivity levels and, by extension, economic growth.

The indispensability of domestic savings to economies is underscored by several salient considerations: Domestic savings assume a pivotal role in bankrolling a spectrum of investments, encompassing the establishment of new enterprises (Forje, 2006), the expansion of extant businesses (Gordon and Bovenberg, 1994), and the pursuit of technological innovation (Niosi et al., 1993). Elevated levels of investment can engender heightened productivity and income, thereby acting as a catalyst for economic growth (Griffin, 1978). Furthermore, robust domestic savings can alleviate a country's external debt burden, enhancing its capacity to weather financial vicissitudes.

In the context of economies characterized by a high middle-income status, the repercussions of domestic savings are typically elucidated through the ensuing conduits: These economies boast an augmented savings potential, affording them the latitude to plow resources into nascent ventures, galvanize corporate expansion, and spearhead technological progress. Elevated savings rates have the potential to buttress financial stability, thereby potentially fostering economic growth. Furthermore, unless burdened by excessive debt obligations, these economies can leverage domestic savings to curtail their dependence on external borrowing, thereby advancing their economic sovereignty.

In summation, for economies inhabiting the realm of high middle-income status, domestic savings epitomize a potent catalyst for stimulating economic growth, reinforcing financial robustness, and advancing economic self-sufficiency. However, the precise impact of domestic savings can vary contingent upon the intricate interplay with other multifarious factors, each shaping the economic landscape in its unique fashion.

1.5. The Relationship Between Labor Force and Economic Growth

The term “labor force” encompasses all individuals actively engaged in an economy’s production activities and possessing the capability to participate in work-related tasks (Heggeness and León, 2023). It encompasses a broad spectrum of individuals, including workers, public servants, self-employed individuals, those currently unemployed, and those potentially seeking employment. Labor is an indispensable resource that substantially contributes to an economy’s capacity to generate goods and services (Sedyastuti et al., 2021).

The nexus between the labor force and economic growth is of paramount importance and can be elucidated through various dimensions: Labor plays a direct and pivotal role in economic growth by actively participating in the production processes. A larger labor force can significantly augment the production of goods and services (Bonacini et al., 2021). The expansion of the labor force holds the potential to engender job creation, which, in turn, can lead to lower unemployment rates and heightened income levels, thereby serving as a catalyst for economic growth (Deininger et al., 2020). The workforce is a breeding ground for technological advancements and innovative breakthroughs, with the acquisition of knowledge, skills, and creativity serving as essential drivers of economic growth (Prasanna et al., 2019). Furthermore, an upswing in the labor force can stimulate consumer spending, as individuals within the workforce possess increased income

levels, resulting in amplified demand for goods and services (Anyanwu et al., 2021).

The pivotal role of labor in economies is underscored by various salient considerations: Labor serves as the linchpin of production processes, enabling the creation of a wide array of goods and services. A burgeoning labor force has the potential to galvanize economic growth. The labor market forms the nucleus of employment dynamics, contributing to positive outcomes such as augmented employment opportunities, diminished unemployment rates (Fakih et al., 2020), and increased income levels (Tenzin, 2019). The labor force constitutes a fertile ground for fostering technological innovations and driving forward progress, thereby upholding economic growth and bolstering competitiveness.

In the context of upper middle-income economies, the ramifications of labor's influence often materialize through the following channels: These economies are well-positioned to leverage their more advanced technological infrastructure and a skilled labor force, thereby bolstering productivity and, consequently, fostering economic growth. The expanded labor market within these economies can engender improved employment prospects for individuals within the workforce, potentially leading to revenue growth. Moreover, these economies are better poised to encourage innovation and channel resources into research and development activities, thereby expediting technological advancements.

In conclusion, labor stands as an indispensable cornerstone for economic growth, with its impacts potentially more pronounced within upper middle-income economies owing to their advanced resource base and capabilities. The size and quality of the labor force wield substantial influence over the trajectory of economic growth. This study seeks to delve into the factors influencing economic growth within 20 high middle-income economies, underscoring their significance in this context. The World Bank classifies countries into income brackets based on their income levels, with those falling within the upper-middle-income category having a per capita Gross National Income (GNI) ranging from \$4,466 to \$13,845 in 2022. By examining the economic performance of these 20 economies, this study aims to offer valuable insights into these nations that straddle the cusp of upper-income status. Notably, this study fills a void by comprehensively analyzing macroeconomic variables specific to this group of countries, thus furnishing novel findings. Consequently, this research endeavor contributes to a deeper understanding of these economies and the formulation of more efficacious economic policies. Additionally, it employs panel econometric

analysis methodologies to holistically assess the impact of FDI, exports, tax revenues, domestic savings, and the labor force on economic growth within these 20 economies, thereby supplying policymakers in these nations with substantial guidance on areas warranting attention to promote economic growth.

2. Methodology and Empirical results

2.1. Data

Based on the World Bank's data for the year 2023, the per capita Gross National Income (GNI) for the year 2022 exhibited a range spanning from \$4,466 to \$13,845 across a group of economies, namely Argentina, Azerbaijan, Colombia, Costa Rica, Dominican Republic, El Salvador, Fiji, Guatemala, Indonesia, Jamaica, Malaysia, Mauritius, Mexico, Namibia, Paraguay, Peru, Russian Federation, South Africa, Thailand, and Türkiye.

The primary focus of this research pertains to an extensive examination of the influence wielded by FDIs, exports, tax revenues, domestic savings, and the labor force on the economic growth trajectories of these 20 economies. The study's temporal scope encompasses the most current and pertinent period, encapsulating data from 1990 to 2021. All the data employed in this research have been meticulously sourced from the comprehensive World Bank database. Detailed insights into each of the variables considered in this study can be found in Table 1.

Table 1. Summary information of the variables.

	Variables	Description	Source
Dep. Var.	GDP	Log(GDP per capita (constant 2015 US\$))	WDI
Indep. Var.	FDI	Foreign direct investment, net inflows (% of GDP)	WDI
Indep. Var.	EXP	Exports of goods and services (% of GDP)	WDI
Indep. Var.	SAV	Gross domestic savings (% of GDP)	WDI
Indep. Var.	TAX	Tax revenue (% of GDP)	WDI
Indep. Var.	LBR	Labor force(% of total Population)	WDI

Table 2 offers a comprehensive overview of the descriptive statistics pertaining to the variables under scrutiny. A detailed analysis of the table reveals that the labor force, as a percentage of the total population, boasts the highest average value, while foreign direct investments exhibit the lowest average. Furthermore, it is noteworthy that exports display the highest standard deviation among the variables, suggesting a considerable degree of heterogeneity across these economies.

The findings elucidate that GDP and urbanization stand out with the highest mean values, underscoring their paramount importance within the sample. Conversely, GDP and energy prices exhibit the most pronounced volatility. This volatility is particularly conspicuous considering that the countries under examination are significant energy importers, implying that substantial fluctuations in energy prices have the potential to exert a significant impact on these nations' macroeconomic indicators. Conversely, economic growth manifests the lowest standard deviation value, indicative of a more stabilized pattern in this regard.

Table 2. Descriptive statistics of variables

	GDP	FDI	EXP	SAV	TAX	LBR
Mean	3.710979	3.266135	36.42985	20.69405	15.45269	66.29864
Median	3.706112	2.390685	31.17335	20.25019	14.194	65.26
Maximum	4.152297	55.07288	121.3114	58.06932	34.62869	84.056
Minimum	3.042378	-7.5955	6.598187	-7.01211	4.838513	48.551
Std. Dev.	0.208169	4.607926	19.34564	10.87395	5.213533	6.513369
Observations	640	640	640	640	640	640

Table 3 provides the computed correlation coefficients among the variables. Upon a careful examination of these correlations, it is evident that the highest absolute correlation coefficient stands at 0.488, while the smallest coefficient is 0.009. Consequently, all correlation coefficients fall within this range. The presence of relatively low correlation coefficients mitigates concerns related to multicollinearity in the model, consequently enhancing the reliability and validity of the study's outcomes.

Table 3. Correlation matrix

Correlation	GDP	FDI	EXP	SAV	TAX	LBR
GDP	1					
FDI	-0.161	1				
EXP	0.009	0.134	1			
SAV	0.188	0.041	0.488	1		
TAX	-0.113	0.081	0.207	-0.220	1	
LBR	-0.125	0.175	0.048	0.271	-0.280	1

2.3. Model specification

The following model is used for this study, which investigates the magnitude and direction of the effect of macroeconomic variables on economic growth.

$$GDP_{it} = a_0 + a_1 FDI_{it} + a_2 EXP_{it} + a_3 SAV_{it} + a_4 TAX_{it} + a_5 LBR_{it} + \varepsilon_{it} \quad (1)$$

Where, ε_{it} represents the error term, while a_1, \dots, a_5 represent the coefficients, respectively. On the other hand, GDP represents economic growth, FDI represents Foreign Direct Investments, EXP represents exports, TAX represents tax revenues, SAV represents domestic savings and LBR represents labor force. Logarithmic transformation was made only for GDP. Original data of other variables were used.

2.4. Investigation procedure

Due to the nature of the data, panel data analysis was initially preferred for the analysis in the research procedure. Subsequently, a Cross-sectional dependence test was conducted to determine which generation of stationarity test would be used. Next, the second generation CIPS stationarity test was performed. To test whether the variables move together in the long run, the second generation Durbin-Hausman test was employed. The magnitude and direction of the effect of explanatory variables on the dependent variable were examined using the AMG. Finally, the Kónya causality test was used to obtain useful information about the relationship between the variables.

2.5. Cross-sectional Dependence Test

Given the increasing trend of globalization, nations have become more interconnected and interdependent. Consequently, when one country

experiences either positive or negative shocks, these effects can spill over to other countries due to cross-sectional dependence. Therefore, in econometric research, it is of utmost importance to recognize and address cross-sectional dependence among variables that may arise from common factors.

In this specific research, an examination of cross-sectional dependence was conducted using a sample of 20 countries with similar economic characteristics. Initially, the LM test proposed by Pesaran in 2004 was employed to assess this aspect. The following equation was used to perform the test.

$$CD_{LM2} = \left(\frac{1}{N(N-1)} \right)^{1/2} \sum_{i=1}^{N-1} \sum_{j=i+1}^N (T \hat{\rho}_{ij}^2 - 1) \quad (2)$$

In situations where it is essential to make a comparison between the quantity of units represented by “N” and the time dimension indicated by “T,” a specific equation should be applied when the time dimension “T” surpasses the number of units “N.”

In cases where the time dimension significantly exceeds the number of units, the following equation should be employed:

$$CD_{LM} = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N T \hat{\rho}_{ij} \quad (3)$$

In this context, “ $\hat{\rho}_{ij}$ ” signifies the association between errors. The primary hypothesis being tested is that there exists no cross-sectional dependence, as expressed by “ $Cov(\mu_{it}, \mu_{jt}) = 0$.” Subsequently, the selection of the preferred hypothesis will rely on the utilization of probability values.

2.5. Panel Unit Root Test

In this study, the unit root test employed is the CIPS (Cross Sectionally Augmented Im, Pesaran and Shin (2003)) test, as developed by Pesaran (2007). The CIPS test methodology involves the decomposition of factors by incorporating cross-sectional means and conducting augmented individual cross-section (ADF) regressions that integrate these cross-sectional means. The hypotheses for this test are defined as follows:

H0: There exists a unit root within panel groups.

H1: Panel groups exhibit stationarity.

The hypothesis examination relies on the utilization of the cross-sectionally augmented Dickey-Fuller (CADF) test statistic, which can be mathematically expressed as follows:

$$CADF_{ist} = t_i(a_i) = (\Delta y_i' M w_i y_{i-1}) / \sqrt{\hat{\sigma}_{\varepsilon i}^2 (y_{i-1}' M w_i y_{i-1})} \quad (4)$$

The cross-sectionally augmented (CIPS) statistic is derived by aggregating the individual averages of CADF (Cross-Sectionally Augmented Dickey-Fuller) statistics. This computation process is outlined as follows:

$$CIPS_{ist} = (1/N) \sum_{i=1}^N CADF_i \quad (5)$$

2.6. Panel Cointegration Test

Macro panels are a type of panel data structure where the time dimension surpasses the unit dimension. These panels are particularly suitable for studying long-term relationships. In this section of the study, which is tailored for macro panels, the Durbin-Hausman cointegration test is employed as a second-generation panel cointegration test. This choice is made considering the presence of cross-sectional dependence within the model.

The Durbin-Hausman test, developed by Westerlund (2008), explores cointegration relationships by conducting factor decomposition on the residuals, especially in scenarios involving cross-sectional dependence. Additionally, this test allows for the investigation of cointegration relationships when the dependent variable is integrated of order one (I(1)), and the explanatory variables may not necessarily display a high degree of cointegration. The general equation used for the Durbin-Hausman cointegration test is as follows:

$$y_{it} = \beta_i x_{it} + \alpha_i' \delta_t + u_{it}, \quad x_{it} = \gamma_i x_{it-1} + \varepsilon_{it} \quad (6)$$

In the equation, δ_t represents the deterministic terms, which can take two forms. When $\delta_t = (\mathbf{1})$, the model assumes a constant term, whereas if $\delta_t = (\mathbf{1}, t)$, it incorporates both a constant and a trend term. Notably, there is no requirement for $\gamma_i = \mathbf{1} (x_{it} \sim I(1))$ in the Dickey-Fuller (DF) function concerning the explanatory variable.

The hypotheses addressed in the Durbin-Hausman cointegration test are formulated as follows:

H0: Absence of Cointegration Relationship

H1: Presence of a Cointegration Relationship

To assess these hypotheses, test statistics developed by Choi (1994) are employed. The Durbin-Hausman test statistic is calculated as follows:

$$DHg = \sum_{i=1}^N \hat{S}_i (\hat{\rho}_{i,OLS} - \hat{\rho}_{i,IV})^2 \sum_{t=2}^T \hat{e}_{it-1}^2 \quad (7)$$

$$DHp = \hat{S}_N (\hat{\rho}_{OLS} - \hat{\rho}_{IV})^2 \sum_{i=1}^N \sum_{t=2}^T \hat{e}_{it-1}^2 \quad (8)$$

The DHp statistic is used to assess panel statistics when the model's slope parameters are uniform or homogeneous, while the DHg statistic pertains to group statistics when these slope parameters exhibit heterogeneity.

In this context, $\hat{\rho}_{OLS}$ signifies the ordinary least squares (OLS) estimation of ρ_i , whereas $\hat{\rho}_{IV}$ represents the estimate of ρ_i obtained through instrumental variables.

2.7. Panel AMG Estimator

After the co-integration test, this study will utilize the Extended Average Group (EAG) predictors originally formulated by Eberhardt and Bond (2009) and Eberhardt and Teal (2010). These predictors serve to address both heterogeneity in slope parameters and the presence of cross-sectional dependence.

The AMG predictors developed by Eberhardt and Bond (2009) and Eberhardt and Teal (2010) incorporate cross-sectional instruments into the forecasting process. This is achieved by adding unobservable common factors and integrating the common dynamic effects of AMG into the model. In the AMG methodology, the model initially introduces dummy variables and then proceeds with the differenced pooled ordinary least squares (POLs) estimation.

$$\Delta y_{it} = \beta \Delta x_{it} + \sum_{t=2}^T c_i \Delta D_t + u_{it} \quad (9)$$

Subsequently, the estimation process involves the subtraction or addition of the common dynamic process ($\hat{c}_t \equiv \hat{u}_t^*$) to the dependent variable. Estimation is then carried out individually for each cross-section, following this adjustment.

$$y_{it} - \hat{u}_t^* = a_i + \beta_i x_{it} + u_{it} d_i x_{it} \quad (10)$$

$$y_{it} = a_i + \beta_i x_{it} + d_i \hat{u}_t^* + u_{it} \quad (11)$$

In the estimated model, the slope parameters undergo normalization by dividing them by the total number of cross-sections (N). Subsequently, the arithmetic mean of these normalized parameters is computed.

$$\hat{\beta}_{AMG} = N^{-1} \sum_i^N \hat{\beta}_i \quad (12)$$

2.8. Panel Kónya Causality

The panel causality analysis was conducted employing the Kónya (2006) test, which offers notable advantages. Firstly, it obviates the need for unit root tests, thus circumventing the assumption of stationarity. Furthermore, the Kónya (2006) test explores causal relationships among non-integrated series while accommodating cross-sectional dependence. Additionally, this test distinguishes itself by its utilization of seemingly unrelated regression (SUR) estimators, originally introduced by Zellner (1962). The equation used for the Kónya (2006) test is presented below:

$$\begin{aligned}
 y_{1,t} &= a_{1,1} + \sum_{l=1}^{ly_1} \beta_{1,1,1} y_{1,t-1} + \sum_{l=1}^{lx_1} \gamma_{1,1,1} x_{1,t-1} + \varepsilon_{1,1,t} & (13) \\
 y_{2,t} &= a_{1,2} + \sum_{l=1}^{ly_1} \beta_{1,2,1} y_{2,t-1} + \sum_{l=1}^{lx_1} \gamma_{1,2,1} x_{2,t-1} + \varepsilon_{1,2,t} \\
 y_{N,t} &= a_{1,N} + \sum_{l=1}^{ly_1} \beta_{1,N,1} y_{N,t-1} + \sum_{l=1}^{lx_1} \gamma_{1,N,1} x_{N,t-1} + \varepsilon_{1,N,t} \\
 y_{1,t} &= a_{2,1} + \sum_{l=1}^{ly_1} \beta_{2,1,1} y_{1,t-1} + \sum_{l=1}^{lx_1} \gamma_{2,1,1} x_{1,t-1} + \varepsilon_{2,1,t} \\
 y_{2,t} &= a_{2,2} + \sum_{l=1}^{ly_1} \beta_{2,2,1} y_{2,t-1} + \sum_{l=1}^{lx_1} \gamma_{2,2,1} x_{2,t-1} + \varepsilon_{2,2,t} \\
 &\vdots \\
 &\vdots \\
 &\vdots \\
 y_{N,t} &= a_{2,N} + \sum_{l=1}^{ly_1} \beta_{2,N,1} y_{N,t-1} + \sum_{l=1}^{lx_1} \gamma_{2,N,1} x_{N,t-1} + \varepsilon_{2,N,t}
 \end{aligned}$$

Within the equation system, various factors such as the time dimension, panel index, sections, and lag specifications for each section are taken into account. The individual regressions within this system are linked solely through simultaneous correlation. Given the presence of this correlation, Zellner's (1962) seemingly unrelated estimator proves to be more advantageous compared to the ordinary least squares estimator. Therefore, we have opted for Zellner's (1962) seemingly unrelated estimation method when making predictions within this equation system. This comprehensive equation system allows for the examination of the causal relationship for each individual unit.

3. Empirical Results

Before initiating the analysis, a cross-sectional dependence test was carried out on all variables, and the outcomes are detailed in Table 4. It's worth noting that in this context, T=32 (time periods) and N=20 (number of countries), with T exceeding N. As a result, the test results for both CDLM1 and CDLM-Adj are presented. The findings of the test indicate that there is

a statistically significant presence of horizontal cross-sectional dependence at the 1% significance level across all variables.

Table 4. Results of cross-sectional dependence test.

Variables	CD _{LM1}	CD _{LM-Adj}
GDP	4574.350*** (0.000)	224.590*** (0.000)
FDI	608.757*** (0.000)	21.159*** (0.000)
EXP	1300.402*** (0.000)	56.640*** (0.000)
SAV	1010.576*** (0.000)	41.772*** (0.000)
TAX	955.659*** (0.000)	38.955*** (0.000)
LBR	1245.565*** (0.000)	53.827*** (0.000)

*Note: *** is significance level at the 1% level.*

After assessing the results of the horizontal cross-sectional dependence test, the next step involved examining the stationarity of the variables, and the findings are presented in Table 5. This table encompasses both the original levels and the first-difference values of the variables. Additionally, for each variable, both stationary and stationary-trend models were subjected to testing. The table reveals that among the variables, only FDI exhibits stationarity at the levels. Moreover, FDI is identified as I(0) for both the stationary and stationary-trend models. In contrast, it is evident that the first-difference values of all the variables exhibit stationarity. Consequently, with the exception of FDI, all other variables possess an integration degree of I(1).

Table 5. Results of unit root test.

Variables	Level		Δ	
	C	C+T	C	C+T
GDP	-2.082	-1.844	-3.743***	-3.817***
FDI	-2.561***	-2.845**	-4.042***	-4.025***
EXP	-1.812	-2.341	-2.937***	-3.125***
SAV	-1.882	-2.767**	-2.989***	-3.135***
TAX	-2.039	-2.151	-3.975***	-4.053***
LBR	-2.128	-2.740	-3.550***	-3.768***

*Note: *** and * are significance levels at the 1% and 10% level, respectively.*

Given the mixed integration levels of the variables, the investigation proceeded to test for cointegration relationships using the Durbin-Hausman test. The outcomes of this test are presented in Table 6. Notably, similar to the stationarity examination, cointegration relationships were assessed for both stationary and stationary-trend models. Moreover, the table provides panel and group statistics results, catering to both homogenous and heterogeneous cases. Upon thorough examination of the table, it becomes evident that none of the results indicate the presence of cointegration relationships among the variables.

Table 6. Results of panel cointegration test.

Tests	C		C+T	
	Test statistic	p-value	Test statistic	p-value
Durbin-H panel statistics	4.431	0.999	3.747	0.993
Durbin-H group statistics	3.346	0.999	2.446	0.999

*Note: * and ** are significance levels at the 1% and 5% level, respectively.*

Now, we will proceed with the estimation of long-term coefficients using the AMG estimator, and the results are outlined in Table 7. Upon reviewing the table, it becomes evident that, with the exception of exports, all variables exhibit a positive influence on economic growth. Tax revenues have the most substantial positive impact on economic growth, while FDI, SAV, and the LBR have the lowest positive impact, all sharing the same magnitude.

The favorable impact of FDI on the economies of the top 20 upper-middle-income countries can be attributed to several factors. Increased foreign capital infusion facilitates the transfer of technological expertise and knowledge to local businesses, potentially enhancing their production methods and product quality. Furthermore, foreign companies often invest in the training and development of the local workforce, leading to increased skill levels and greater efficiency. Moreover, greater inflows of foreign capital can augment foreign exchange reserves for the host economy, providing additional resources for financial stability. This can further integrate the country into international trade, potentially bolstering exports and improving the country's trade balance. The creation of new employment opportunities can lead to reduced unemployment rates and higher household incomes. Additionally, foreign capital investments often prioritize research and development (R&D) activities, providing resources for the development of new products and processes in local economies.

Exports are intricately linked to exchange rates, with currency appreciation making goods and services more costly in foreign markets, potentially resulting in decreased exports. Additionally, exports represent the sale of goods and services to foreign nations, making them dependent on the economic conditions of foreign countries, fluctuations in domestic demand, and other global factors. Stagnant or declining external demand can have adverse effects on economic growth. However, the expansion of exports typically necessitates significant capital and resources, which may sometimes be insufficiently available to local firms, limiting economic growth. Furthermore, boosting exports usually requires the creation of competitive products and services and effective competition in foreign markets. If local firms lag technologically, export potential may diminish. On the flip side, intense competition in global markets can exert downward pressure on prices and narrow profit margins.

Domestic savings serve as a critical resource for investments, financing endeavors that support economic growth, such as the establishment of new businesses, the expansion of existing ones, and the augmentation of production capacity. Additionally, domestic savings can inject more resources into local credit markets, facilitating business access to favorable financing conditions, thereby encouraging investments. Moreover, these savings can fund research and development (R&D) activities, contributing to the innovation of products and processes. Furthermore, domestic savings can be directed towards public investments, including infrastructure projects, which can propel economic growth. However, well-designed fiscal policies can enhance domestic savings. Specifically, tax policies can be structured to incentivize savings and not unduly burden businesses and individuals.

Tax revenues play a vital role in government financing of public services and infrastructure investments. High-quality infrastructure and public services support the efficient operation of the private sector. Additionally, tax revenues can contribute to the development of legal and institutional frameworks, strengthening the business environment and encouraging investments. These revenues are instrumental in maintaining government fiscal stability by managing budget deficits and ensuring public debt remains at sustainable levels, ultimately supporting economic stability. Tax revenues can signal a stable and favorable business environment for investors and international corporations, attracting FDI and fostering economic growth. To maximize the positive impact of tax revenues on economic growth, tax policies should be well-structured, equitable, and designed to incentivize investments.

The labor force is a fundamental component of a country's production capacity, contributing significantly to economic growth. An expanded labor force enables the utilization of additional labor resources, directly contributing to economic growth. However, for this growth to be effective, workforce productivity must also rise concurrently. A growing workforce can facilitate the development of new ideas and innovations, as more individuals have the potential to engage in creating and implementing new technologies, thereby supporting economic growth. Workforce growth can also incentivize the establishment of new businesses and promote entrepreneurship, generating new job opportunities and contributing to economic growth. Nevertheless, for the workforce to be a true driver of economic growth, it must align with other factors. This includes maintaining control over unemployment rates and ensuring fair income distribution. Additionally, the presence of suitable job opportunities and employment policies is crucial for fully harnessing the potential of the workforce.

Table 7. Results of AMG regression

Variables	Coefficient	Std. Err.
FDI	0.002* (0.054)	0.0009
EXP	-0.0006 (0.315)	0.0006
SAV	0.002*** (0.004)	0.0008
TAX	0.005*** (0.004)	0.002
LBR	0.002 (0.347)	0.003
C	3.310*** (0.000)	0.186

*Note: * and *** are significance levels at the 10% and 1% level, respectively.*

Finally, an examination of causality among the variables has been conducted, with the results outlined in Table 8. Upon thorough analysis of the table, it becomes apparent that a unidirectional causal relationship exists, with EXP and domestic SAV causing changes in GDP, and SAV causing changes in FDI, while FDI causes changes in LBR.

This unidirectional causal connection from EXP and SAV to GDP, along with SAV's influence on FDI, and FDI's impact on LBR, can be ascribed to

several factors. These factors encompass external demand dynamics, access to foreign markets, value addition processes, and the financing of investments. The direct enhancement of economic growth by exports and the capacity of domestic savings to fund economic growth significantly contribute to a country's overall economic development.

Table 8. Results of Konya panel causality test.

Variables	GDP	FDI	EXP	SAV	TAX	LBR
GDP		25.599 (0.963)	32.360 (0.799)	50.633 (0.121)	40.951 (0.429)	47.629 (0.190)
FDI	34.559 (0.713)		24.104 (0.978)	27.718 (0.929)	40.932 (0.429)	60.996** (0.018)
EXP	59.931** (0.022)	25.480 (0.964)		26.720 (0.947)	48.570 (0.166)	25.120 (0.968)
SAV	53.748* (0.073)	57.513** (0.036)	36.152 (0.644)		28.252 (0.918)	25.813 (0.960)
TAX	48.342 (0.172)	20.597 (0.995)	28.143 (0.921)	30.173 (0.870)		34.971 (0.696)
LBR	35.743 (0.662)	49.559 (0.143)	33.485 (0.757)	26.289 (0.953)	40.735 (0.438)	

*Note: * and ** are significance levels at the 1% and 5% level, respectively.*

4. Conclusion and Policy Implications

This study delves into the examination of how Foreign Direct Investments, exports, tax revenues, domestic savings, and labor influence the economic growth of 20 upper-middle-income countries. These countries include Argentina, Azerbaijan, Colombia, Costa Rica, Dominican Republic, El Salvador, Fiji, Guatemala, Indonesia, Jamaica, Malaysia, Mauritius, Mexico, Namibia, Paraguay, Peru, Russian Federation, South Africa, Thailand, and Türkiye. Panel econometric analysis serves as the primary methodology in this investigation.

The study initiates with an exploration of cross-sectional dependence among the variables. Subsequently, second-generation stationary tests, specifically the CIPS test, are employed based on research findings. To scrutinize the long-term interplay of variables, the Durbin-Hausman test and the AMG estimator for long-term coefficients are applied. Lastly, the research investigates the causal relationships among all variables using the Konya test.

The primary findings of this study underscore the predominantly positive impact of all variables, with the exception of EXP, on economic growth throughout the study period. Notably, FDI emerges as a significant driver of economic growth. This is attributed to foreign capital's capacity to facilitate technology transfer, provide training to the local workforce, and create new employment opportunities within local economies. Tax revenues also demonstrate a positive influence on economic growth, as they contribute to public service financing, bolster economic stability, and support infrastructure development. Furthermore, domestic savings are identified as a pivotal factor in economic growth, furnishing resources for the establishment of new businesses, the expansion of existing enterprises, and the augmentation of production capacity. Additionally, the expansion of the labor force is recognized as a positive contributor to economic growth, contingent upon concurrent productivity enhancements. However, exports exhibit a modestly negative impact on economic growth, suggesting limited influence from fluctuations in external demand on economic growth in these countries.

These findings yield several policy recommendations to foster economic growth in these 20 nations:

Governments should prioritize the enhancement of business regulations and investment environments to attract foreign capital inflow. Policymakers should consider incentive strategies to stimulate technology transfer and workforce training by foreign investors.

To bolster economic growth through exports, countries should adopt policies conducive to the development of competitive products and services. Additionally, they should encourage effective competition in foreign markets.

Tax policies should be meticulously designed to avoid overburdening businesses and individuals, while concurrently incentivizing investments. Ensuring efficient utilization of tax revenues and strategically directing public expenditures toward economic growth-promoting endeavors is essential.

Implementing policies that encourage savings and educational programs can potentially lead to higher savings rates, consequently augmenting investment resources and fostering economic growth. Significant investments in education and skill development programs are crucial to enhance labor force productivity and bolster competitiveness.

It is essential to underscore that these policy recommendations should be customized to align with the specific circumstances and needs of each country, considering their unique contexts and individual characteristics.

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