

Market Capitalization and Economic Growth Nexus: A Mediation Analysis for Selected Countries

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ABSTRACT

The study examined the mediating role of market capitalization in the relationship between economic growth and macroeconomic variables in twenty countries, including foreign direct investment, gross fixed capital formation, government spending, and inflation. The study has used panel data of twenty countries from the period of 2002-2021. The selection of countries involves three criteria, first; the study selected three regions; Asia, Europe, and Mena region. Secondly, among those selected countries, the study tried to select all three categories, higher income countries, middle income countries, and upper middle-income countries. The selection of these countries follows the criteria of GDP growth rate of 2021. Thirdly, these economies are either emerging economies or the economies who have established the stock market and getting its benefits for sustained GDP growth rate e.g. Australia, China, and Germany etc. Panel regression results show that foreign direct investment, gross fixed capital formation, consumption expenditures, inflation, GDP per employed person, and education expenditures all contribute to economic growth in selected countries, whereas an increase in the real effective exchange rate reduces growth. Hayes (2022) employs a mediation analysis approach that confirms market capitalization as a partially mediating variable between the rate of economic growth and various control variables in case of selected 20 countries. Providing more favorable policies for investors and enterprises, such as special economic zones and free tax breaks. Furthermore, emphasis on the money supply and preserving the currency's balance between face and interior worth. Increased foreign direct investment raises the country's workforce demand.

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INTRODUCTION

Economic growth is a crucial factor in achieving the Sustainable Development Goals (SDGs), a comprehensive framework adopted by United Nations member states in 2015. While economic growth is not the sole determinant, it provides resources, investments, and opportunities for sustainable development (World Bank, 2015). Financial development facilitates international cooperation, enabling cross-border investments and transactions (Badun, 2009). Economic growth in one region can positively impact the global economy through interconnected markets which ultimately reduces economic inequality by providing marginalized groups with access to financial resources (Ben Hamouda, 2022). The growing importance of stock markets in emerging economies throughout the world has shifted the emphasis of

many scientists, researchers, policymakers, and economists to studying the causes of stock market growth during the last several decades (Chiad & Hadj Sahraoui, 2021).

Macroeconomic factors can significantly impact stock prices, with relationships being dynamic and subject to change. Increased foreign direct investment (FDI) can boost corporate profits and stock prices, while a weaker domestic currency can benefit export-oriented companies. Moderate inflation indicates a healthy economy, while high or hyperinflation can erode purchasing power and raise interest rates. Productivity gains, often linked to economic growth, can also positively impact stock prices by increasing corporate profits. The stock market plays a mediating role between economic growth and other macroeconomic variables such as exchange rate, FDI, inflation, labor productivity, and education through several channels. A rising stock market indicates positive economic sentiment and attracts investments, contributing to economic growth (Chikwira & Mohammed, 2023; Chiad & Hadj Sahraoui, 2021; Nawaz et al., 2023). Conversely, a declining market may signal economic concerns. The stock market can influence exchange rates through capital flows, affecting a country's trade balance. A robust stock market attracts foreign investors and is seen as a healthy financial system, making a country more attractive for FDI. Inflation expectations can affect stock prices, and central banks monitor trends to assess inflation outlooks (Yakubu, 2023). A thriving stock market can boost corporate profitability, encourage investments in innovation, and indirectly affect education through economic growth and government revenues (Chun et al., 2020). The stock market acts as a barometer of economic health, influencing and being impacted by a variety of macroeconomic variables. Its fluctuations are frequently representative of investor assessments of the general economic situation, and policymakers and analysts actively study it for insights into economic trends and future (Ugbam et al., 2023; Christopoulos & Tsionas, 2004; Mehmood et al., 2023).

Developed countries have mature, liquid, and efficient stock markets, reflecting economic conditions accurately. They have diverse, stable economies with well-established industries and services, driven by innovation, productivity gains, and global trade (Gurung, 2020; Dube, 2020). Companies have better access to capital through well-established financial markets, facilitating business expansion and investment. Developed countries are more integrated into the global economy, influencing their stock markets by international factors. These things are totally different for poor and developing countries and hence the role of stock market towards economic growth is also different (Rizkallah, 2023; Feng et al., 2017; Moin & Qureshi, 2023).

The relationship between stock market performance and economic growth in developing countries is complex and influenced by factors like GDP growth, inflation rates, and employment levels. Factors like foreign investment patterns can influence stock market performance (El-Sady et al., 2022). Developed nations have more sophisticated investors, institutional investors, and global economic trends, whereas developing countries are impacted by local economic situations and regional variables, as well as smaller, less liquid markets that are more volatile (Khalikov, 2017).

Numerous research has been conducted to investigate the link between stock market performance and its impact on economic growth and other macroeconomic factors. Number of studies have tried to investigate this relationship through mediation analysis also. The current study is an effort to explore this mediation role of market capitalization between economic growth and other macroeconomics variables for the panel of developing and developed countries. The cross-sectional difference of the country has a significant role towards the mediating role of market capitalization. As discussed above, the circumstance of developing country is different from developed country and hence can play its role towards the mediating role of market capitalization towards economic growth of the country. Hence, the taking the panel of developing and developed countries, this study aims to capture the mediating role of market capitalization towards economic growth and other macroeconomic variables.

The rest study is balanced as, section two presents the literature, section three explains the data and methodology, section four explains the results of the study while last section concludes the study and gives policy recommendations.

LITERATURE REVIEW

Because of its association with economic considerations, the stock market plays an important role in any country, developed or developing. There are some disagreements over the role of the stock market in a nation's economy, but it cannot be denied that stock market elements may help to the growth of a nation's economy provided politicians make supportive decisions. The study by Brown et al. (2017) found that the stock market positively impacts the growth of the high-tech industry, with nations with larger high-tech sectors experiencing faster future economic growth. Chun et al. (2020) suggests using stock market indicators to assess market risk and forecast economic performance, with volatility index (VKOSPI) futures contracts being recommended for improved credibility and efficiency. Macroeconomic factors such as US inflation, lending interest rates, and currency rates also stimulate economic growth. Nathaniel et al. (2020) found that stock market capitalization ratio, value of traded shares, and market turnover ratio significantly impact economic growth, with the value of traded shares having a negative effect. Manasseh et al. (2017) found a bidirectional causal relationship between stock market development and economic growth, and Nguyen and Bui (2019) found economic development linked to both stock and real estate markets. Foreign investment in the stock market promotes economic growth, while a rising economy can benefit the domestic market.

Sikarwar and Appalaraju (2018) found a unidirectional causal association between stock market performance and economic development in India, with GDP and stock market returns being linked. Economic growth is defined as the rise in a country's real GDP or gross national product. A well-developed stock market can boost long-term economic growth by enhancing capital accumulation and improving resource allocation. The financial market is crucial for capital formation and the development of goods and services that provide capital access. Egypt and Saudi Arabia have higher savings than Tunisia, but the relationship between savings and stock market development is weak in Egypt and Tunisia, but strong in Saudi Arabia. Most MENA nations began liberalizing their stock markets in the 1990s, leading to the

expansion of stock markets in other countries. However, expansion does not typically boost banking activities, suggesting that the banking sector and financial intermediation in MENA nations are underdeveloped, resulting in a lower success rate in accelerating development.

The research on stock market performance, market capitalization, GDP growth rate, and other macroeconomic linkages yielded inconsistent results. In certain nations, the stock market stimulates economic growth with other macroeconomic variables such as foreign direct investment, currency rates, and inflation. This study, which includes the mediation effect of market capitalization between economic development and other macroeconomic factors, will result in more viable policy solutions for specific nations.

Theoretical Framework

There are a few significant theories that are presented in the below paragraphs because these theories are effective to establish the foundation for a research study in an effective manner.

Harrod-Domar (Hd) Model of Neo-Keynesian Theory

The Harrod-Domar (HD) model, which explains how capital and saving levels effect an economy's development, is described in Neo-Keynesian theory. This model illustrates how capital accumulation influences economic growth in addition to explaining technical advancement. This approach necessitates an additional capital stock for economic growth and development. According to Karmakar (2021), this model presents a solution that is effective in understanding the underdevelopment of capital stock. Therefore, it is just essential to increase the number of resources available to encourage investment. This strategy, according to the Harrod-Domar (HD) model, is insufficient to ensure full employment since it fixes the labor and capital stock, as well as the characteristics that are utilized.

Neoclassical Theory of Growth

Neoclassical theory examines production and income distribution employing technology, consumer preferences, and productive factor endowments as exogenous factors. It assumes Say's law, ignores aggregate demand, and concentrates solely on supply considerations. A continuum of production processes enables replacement until endowments are completely exploited. The relative scarcity of productive components affects income distribution, whereas the combination of technology and factor endowment defines each element's equilibrium marginal output. These assumptions are deemed exogenous to the neoclassical growth model. However, According to Karmakar (2021), the neoclassical approach has been criticized for its inability to defend and justify the registering of varied amounts of investments in GDP and technological advancement. It has been noticed that some emerging nations lack investment owing to corruption, weak infrastructure, or both.

Endogenous Growth Theories

In this model, long economic growth is related to and viewed as an endogenous variable, allowing for infinite production per capita growth. It can do so because it has an infinite capacity for implementing new ideas. Furthermore, government policy can influence all government policy actions and growth rates, such as infrastructure provision, intellectual property protection, regulations, taxation, and law and order enforcement, according to the endogenous growth framework, because it has the potential to influence the speed of creativity and activity (Johansson et al., 2012). Furthermore, there are various benefits to employing these models in government. As a result, the nation's financial structure and policy, such as its taxes and regulatory systems, as well as its macroeconomic distribution and financial structures, have a significant influence on saving decisions and investment distribution, such as whether to change long-term growth. Endogenous growth models, including neo-Keynesian and neo-classical growth models, give different definitions of growth, but they all agree that growth in total factor productivity is an important component of economic growth (Johansson et al., 2012). Furthermore, the development and preservation of an entrepreneurial spirit and a leadership culture are endogenous processes. Attracting university-educated labour and expanding the region's market potential are both endogenous processes that regional policy may help to promote and drive. Furthermore, regional expansion provides fresh resources for the development of educational programs and infrastructure, etc.

DATA AND METHODOLOGY

The study has used panel data of twenty countries from the period of 2002-2021. The selection of countries involves three criteria, first; the study selected three regions; Asia, Europe, and Mena region. Secondly, among those selected countries, the study tried to select all three categories, higher income countries, middle income countries, and upper middle-income countries. The selection of these countries follows the criteria of GDP growth rate of 2021. Thirdly, these economies are either emerging economies or the economies who have established the stock market and getting its benefits for sustained GDP growth rate e.g. Australia, China, and Germany etc. The data has been taken from multiple sources i.e. World Development Indicators (WDI) by The World Bank, International Financial Statistics (IFS), several economic surveys of respective countries and Central Bank's publications. Panel data frequency might be monthly, quarterly, or yearly. It is commonly used in countries, enterprises, and panel data economic analysis. When compared to cross-section or time series data, panel data is also effective in finding unobservable effects. A short panel is one in which the time is less than the number of cross-sections. A lengthy panel is one in which the time exceeds the number of cross-sections. If there are no missing observations in any of the cross-sections across the whole time, the panel data is considered balanced; if there are any missing observations in any of the cross-sections, the panel data is considered imbalanced. Table 1 shows the quick but brief view of data sources and variable construction.

Table 1: Data Sources and Variable Description

Variable	Variable Name	Type of Variable	Data Source
Con_exp	Consumption Expenditure	Independent Variable	WDI, IFS
Exp_edu	Expenditure on Education	Independent Variable	WDI, IFS, Economic Surveys
REER	Real Effective Exchange Rate	Independent Variable	WDI, IFS
FDI	Foreign Direct Investment	Independent Variable	WDI, Economic Surveys
GDP_emp	GDP Per Employed Person	Independent Variable	WDI, IFS, Economic Surveys
GDP_growth	GDP Growth Rate	Dependent Variable	WDI, IFS, Economic Surveys
GFCF	Gross Fixed Capital Formation	Independent Variable	WDI, IFS, Economic Surveys
Inf	Consumer Price Index	Independent Variable	WDI, IFS
MC	Market Capitalization	Independent Variable / Mediating Variable	WDI, IFS, Economic Surveys

Based on above variable selection and objectives, the study developed following econometric model.

$$GDP_growth_{i,t} = \alpha_{i,t} + \beta_1 Con_exp_{i,t} + \beta_2 Exp_edu_{i,t} + \beta_3 REER_{i,t} + \beta_4 FDI_{i,t} + \beta_5 GDP_emp_{i,t} + \beta_6 GFCF_{i,t} + \beta_7 INF_{i,t} + \beta_8 MC_{i,t} + e_{i,t} \quad (\text{Eq 1})$$

Where GDP_growth is GDP growth rate, Con_exp is consumption expenditure, Exp_edu is government expenditure, REER shows real effective exchange rate, FDI is foreign direct investment, GDP_emp is GDP per employed persons, GFCF is gross fixed capital formation, INF is inflation, and MC is market capitalization.

The first empirical methodology which has been used to meet the research objective is panel regression model. Further, the study utilized the Hausman test to check the fixed and random effect in the model.

The second empirical methodology which fits our research objectives is the mediation analysis introduced by Hayes (2022). The third empirical methodology is Granger Casualty Analysis. The study has used two diagnostic analyses i.e. correlation matrix and unit root analysis. This analysis has been used to understand the data normality and time variant properties of the data. Moreover, the descriptive analysis has also been performed to know the data normality and outlier issues.

RESULT AND DISCUSSION

Descriptive Analysis

The descriptive analysis is the raw analysis of data which basically explain the distributional information of the data. It includes maximum values the data has, mean values, minimum values to make an understanding about data distribution. Standard deviation is also one of the important indicators which explain the deviation of the mean value from the distribution. Moreover, to confirm the data normality, this study has used Skewness, Kurtosis, and Jarque-Bera test. Table 2 shows that mean value of consumption expenditure is 3.4, median value is 2.9, maximum value is 24.23 and minimum value is -9.03. The value of standard deviation (SD) is 3.65 which shows that data is more spread out around the

mean. The value of Skewness measures the asymmetry of the distribution of data while kurtosis measures heaviness of the distribution of tail. The values of Skewness and Kurtosis shows that data of asymmetric and normally distributed. The value of Jarque-Bera test is 164.30. The mean value of expenditure on education is 4.5, median value is 4.6, maximum value is 8.5 and minimum value is 0.99. The SD is 1.04 which shows that data is more spread out around the mean. The values of Skewness (0.160) and Kurtosis (4.25) shows that data of asymmetric and normally distributed. The value of Jarque-Bera test is 27.80. The mean value of real effective exchange rate is 85.41, median value is 97.32, maximum value is 140.29 and minimum value is -7.31. The SD is 36.88 which shows that data is more spread out around the mean. The values of Skewness (-1.58) and Kurtosis (4.21) shows that data of asymmetric and normally distributed. The value of Jarque-Bera test is 192.08. The mean value of foreign direct investment is 4.45, median value is 2.71, maximum value is 106.60 and minimum value is -40.08. The SD is 10.14 which shows that data is more spread out around the mean. The values of Skewness (4.70) and Kurtosis (42.30) shows that data of asymmetric and normally distributed. The value of Jarque-Bera test is 27228.76.

Moreover, the mean value of GDP per employed person is 75447.97, median value is 78605.91, maximum value is 215522.2 and minimum value is 7197.88. The SD is 36773.7 which shows that data is more spread out around the mean. The values of Skewness (0.100) and Kurtosis (2.95) shows that data of not asymmetric and not normally distributed. The value of Jarque-Bera test is 0.698 which is insignificant at 1 percent level. It shows that data has some normality issues. The mean value of GDP growth rate is 3.31, median value is 3.01, maximum value is 24.37 and minimum value is -11.32. The SD is 3.73 which shows that data is more spread out around the mean. The values of Skewness (0.30) and Kurtosis (6.73) shows that data of not asymmetric and normally distributed. The value of Jarque-Bera test is 238.30. The mean value of gross fixed capital formation is 24.96, median value is 23.93, maximum value is 54.30 and minimum value is 11.99. The SD is 6.01 which shows that data is more spread out around the mean. The values of Skewness (1.26) and Kurtosis (5.69) shows that data of not asymmetric and normally distributed. The value of Jarque-Bera test is 227.19. The mean value of inflation is 3.09, median value is 2.05, maximum value is 44.96 and minimum value is -4.47. The SD is 4.17 which shows that data is more spread out around the mean. The values of Skewness (4.18) and Kurtosis (33.08) shows that data of not asymmetric and normally distributed. The value of Jarque-Bera test is 16247.23. The mean value of market capitalization is 80.58, median value is 63.63, maximum value is 462.32 and minimum value is 8.74. The SD is 65.64 which shows that data is more spread out around the mean. The values of Skewness (2.18) and Kurtosis (9.81) shows that data of not asymmetric and normally distributed. The value of Jarque-Bera test is 1091.39.

Table 2: Descriptive Analysis: Panel of 20 Countries

	Consumption Expenditure	Expenditure on Education	Real Effective Exchange Rate	Foreign Direct Investment	GDP Per Employed Person	GDP Growth Rate	Gross Fixed Capital Formation	Inflation	Market Capitalization
Mean	3.400110	4.579133	85.41676	4.457043	75447.97	3.315166	24.96208	3.092811	80.58277
Median	2.918091	4.673015	97.35268	2.715753	78605.91	3.011900	23.93552	2.051646	63.63743
Maximum	24.23234	8.510460	140.2971	106.6026	215522.2	24.37045	54.30437	44.96412	462.3266
Minimum	-9.0322	0.999000	-7.3109	-40.0866	7197.883	-11.3254	11.99338	-4.4781	8.741823
Std. Dev.	3.656760	1.040781	36.88697	10.14184	36773.72	3.739692	6.013477	4.173368	65.64734
Skewness	0.521172	0.160466	-1.5843	4.707732	0.100249	0.307712	1.262862	4.183143	2.184318
Kurtosis	5.961699	4.251167	4.218607	42.30744	2.958697	6.730880	5.693054	33.08055	9.811660
Jarque-Bera	164.3024	27.80695	192.0862	27228.76	0.698418	238.3035	227.1969	16247.23	1091.395
Probability	0.000000	0.000001	0.000000	0.000000	0.705246	0.000000	0.000000	0.000000	0.000000
Sum	1360.044	1831.653	34166.70	1782.817	30179187	1326.066	9984.832	1237.124	32233.11
Sum Sq. Dev.	5335.385	432.2065	542898.9	41039.94	5.40E+11	5580.133	14428.60	6949.382	1719520.
Observations	400	400	400	400	400	400	400	400	400

Unit Root Results

The study first tested the data of variables for unit root by using two panel unit root tests, PP-Fisher Chi-square (PPF) and Levin, Lin & Chu (LLC). The checking of data stationarity is very important before estimating the model through any regression analysis because non-stationarity data violates the assumptions of Ordinary Least Square Method. The first step in unit root detection is to make a decision about the trend and intercept of the data. In general, most of the financial series has always trend and intercept. However, this study detected the trend and intercept of the data by using line graph method. All the data series has trend and intercept. Hence, the unit root has been tested under trend and intercept model. Table 3 shows that the variable consumption expenditure is stationary at level because the critical value of PPF test (177.278) and LLC test (-8.353) is greater than the tabulated values at 1 percent significance level. The second variable is expenditure on education which is non-stationary at level in both tests, PPF and LLC. The problem of unit root has been resolved by taking first difference of the series. Hence, this variable is stationary at first difference where the value of PPF is 174.693 and the value of LLC is -11.121. The variable real effective exchange rate is stationary at level under 5 percent significance. The variable FDI is stationary at level in both tests. The critical value under PPF test is 125.022 and the value in LLC is -6.521 which shows that it is stationary at 1 percent significance level. The variable GDP per employed persons is non-stationary at level under PPF test but stationary under LLC test (-3.316). This variable has been tested further for first difference under both tests. Under PPF test this variable becomes stationary at first difference because the critical value is 179.482 which is greater than the tabulated value at 1 percent significance level. Furthermore, GDP growth rate, inflation, and market capitalization are stationary at level under both tests. However, Gross fixed capital formation is stationary at first difference under both tests. Hence, the study concluded mixed order of integration among variables under PPF and LLC panel unit root tests.

Table 3: Results of Unit Root: Panel of 20 Countries

	PP - F	LLC	PP - F	LLC
	Level		1 st Difference	
Consumption Expenditure	177.278***	-8.353***		
Expenditure on Education	23.271	0.4963	174.693***	-11.121***
REER	71.239**	-3.115**		
FDI	125.022***	-6.521***		
GDP Per Employed Person	42.773	-3.316**	179.482***	-8.704***
GDP Growth Rate	193.872***	-12.873***		
Gross Fixed Capital Formation	30.931	-1.766	162.968***	-9.059***
Inflation	140.730***	-9.704***		
Market Capitalization	106.060***	-3.6223***		

Note: *** shows 1% significance level, ** shows 5% significance level

Pearson's Correlation Matrix

The second step before the model estimation and especially the mediation model is to check the correlation among variables. The study has used Pearson Correlation Matrix to check the association between variables. Table 4 shows that the consumption expenditure is negatively associated with educational expenditure in case of selected 20 countries. However, the correlation among both variables is weak which is only 25 percent. The association between consumption expenditure and real effective exchange rate is positive. However, there is a weak correlation among consumption expenditure and real effective exchange rate which is only 5 percent. Consumption expenditure and foreign direct investment is positively associated with each other and the association between both variables are 12 percent. Consumption expenditure is 39 percent negatively associated with GDP per employed persons. Moreover, Consumption expenditure is 75 percent positively associated with GDP growth rate. Furthermore, consumption expenditure is positively associated with Gross fixed capital formation, inflation, and market capitalization. The level of association is 29, 38, and 1 percent among these variables.

The next variable is expenditure on education which is positively associated with real effective exchange rate, foreign direct investment, GDP per employed person, and market capitalization. The highest association has been found in case of GDP per employed person which is 35 percent. Furthermore, the low association among expenditure on education has been found with real effective exchange rate (2 percent). The negative association between expenditure on education and GDP growth rate, gross fixed capital formation, and inflation has been found. The variable real effective exchange rate has been negatively associated

with foreign direct investment and GDP per employed person while positively associated with GDP growth rate, gross fixed capital, inflation, and market capitalization. The highest association in case of real effective exchange rate has been found with foreign direct investment (24 percent) while lowest association (7 percent) has been found with GDP per employed persons. The variable foreign direct investment is negatively associated with market capitalization while positively associated with GDP per employed person, GDP growth rate, gross fixed capital formation, and inflation. The highest association between foreign direct investment and GDP growth rate has been found (17 percent) while the lowest association is with gross fixed capital formation (4 percent). The variable GDP per employed person is positively associated with market capitalization (8 percent association) while negatively associated with GDP growth rate (40 percent association), gross fixed capital formation (18 percent association), and inflation (34 percent association). The variable GDP growth rate is negatively associated with market capitalization (15 percent association) while positively associated with GDP Gross fixed capital formation (35 percent association) and inflation (39 percent association). Gross fixed capital formation is positively associated with inflation (7 percent association) and market capitalization (15 percent association), while inflation is negatively associated with market capitalization (21 percent associated).

Table 4: Results of Pearson Correlation Matrix: Panel of 20 Countries

	Consumption Expenditure	Expenditure on Education	REER	FDI	GDP Per Employed Person	GDP Growth Rate	Gross Fixed Capital Formation	Inflation	Market Capitalization
Consumption Expenditure	1.0000								
Expenditure on Education	-0.2548	1.0000							
REER	0.0553	0.0231	1.0000						
FDI	0.1259	0.1318	-0.2490	1.0000					
GDP Per Employed Person	-0.3916	0.3520	-0.0785	0.1024	1.0000				
GDP GR	0.7456	-0.2778	0.0650	0.1704	-0.4060	1.0000			
GFCF	0.2977	-0.1742	0.0796	0.0417	-0.1880	0.3481	1.0000		
Inflation	0.3853	-0.2379	0.1704	0.1307	-0.3429	0.3876	0.0783	1.0000	
Market Capitalization	0.0189	0.1368	0.0879	-0.0688	0.0859	-0.0153	0.1510	-0.2132	1.0000

Panel Regression Analysis

After checking the unit root and correlation among variables the next step is to estimate the model by using Panel Regression Analysis. Table 5 shows the findings of panel regression analysis. The study found that all the variables are significant expect educational expenditure and GDP per employed persons, and inflation in case of selected 20 countries. The coefficient of FDI shows that it increases GDP Growth rate in case of selected 20 countries. The GDP growth rate will increase by 2 percent due to increase in FDI in those selected 20 countries.

These results are in line with the literature of several countries where FDI tends to increase GDP growth rate of the economy. These studies include the study by Navarro et al. (2022); Mamingi and Marti (2018); Talwar and Srivastava (2016); Dierk (2010); and Chikwira and Mohammed (2023). Furthermore, gross fixed capital formation increases GDP growth rate, means GDP growth rate goes up by 10 percent due to 1 unit increase in gross fixed capital formation. Gross fixed capital formation has been considered as one of the factors that boost GDP growth rate as evident by number of studies in literature. For example, the study by Ongo and Vukenkeng (2014) and Purba et al. (2019).

Consumption expenditures increase GDP growth rate by 46 percent due to 1 unit increase. One unit increase in inflation in the selected 20 countries will increase GDP growth rate of those countries by 8 percent. However, this variable is significant at 10 percent significance level. This result is also in line with the existing literature. The study by Marica and Piras (2018) and Toosi (2002) found the same relationship between consumption expenditure and GDP growth rate. Exchange rate is negatively related with GDP growth rate in selected 20 countries, meaning 1 percent increase in the exchange rate will decrease the GDP growth rate of those countries by 4 percent. This result is in line with the study by Subhajib (2002) and Han (2019). Market capitalization is positively related with GDP growth rate of selected countries, meaning 1 unit increase in the market capitalization will increase the GDP growth rate of these countries by 1 percent. The results are in line with Alshubiri (2021) and Dökmen et al. (2015). The value of Hausman test confirms the existence of fixed effect model for selected twenty countries. Meaning that fixed effects capture unobserved individual heterogeneity that does not vary over time but may affect the dependent variable. Depending on the heterogeneous characteristics of the countries in the clusters, the role of market capitalization and other independent variables can have different impact on economic growth of the country.

The overall diagnostics of panel regression results shows that results are good and model is perfectly specified. The value of R-square shows that 70 percent variation in GDP growth rate has been explained by independent variables. The probability value of F-statistics shows that model is good fit.

Table 5: Results of Panel Regression Analysis: Panel of 20 Countries

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.651383	1.867292	0.348839	0.7274
FDI	0.027844	0.012775	2.179651	0.0300
Gross Fixed Capital Formation (-1)	0.109840	0.036226	3.032084	0.0026
Expenditures on Education (-1)	0.029872	0.183138	0.163114	0.8705
Consumption Expenditure	0.468523	0.044804	10.45712	0.0000
Inflation	0.081018	0.055000	1.473069	0.1417
GDP per Employed Person (-1)	1.49E-05	1.51E-05	0.983073	0.3263
REER	-0.040293	0.013307	-3.027896	0.0027
Market Capitalization	0.001998	0.001086	1.96013	0.0000
Fixed Effect/Random Effect				
R-squared	0.706385	Mean dependent var	3.339310	
Adjusted R-squared	0.666826	S.D. dependent var	3.779644	
S.E. of regression	2.181656	Akaike info criterion	4.511121	
Sum squared resid	1589.715	Schwarz criterion	4.988089	
Log likelihood	-811.1130	Hannan-Quinn criter.	4.700384	
F-statistic	17.85654	Durbin-Watson stat	1.781393	
Prob(F-statistic)	0.000000			

Note: Dependent Variable: GDP_GROWTH
Method: Panel Least Squares
Total panel (balanced) observations: 380

Granger Causality Test

The study further checks the causality between GDP Growth rate and Market Capitalization for selected 20 Countries. Granger causality test investigates the way of causality between variables. There are two possible ways of causality between variables, uni-directional and bi-directional causality. If the one variable granger causes other variable only this is called un-directional causality and if both variables cause each other it is called bi-directional causality. The study selected 2 lag length while estimating the Granger causality analysis between GDP growth rate and market capitalization. The main intension behind this analysis is to investigate the way of causality among GDP growth rate and market capitalization for selected countries.

Table 6 shows one-way causality among market capitalization and GDP growth rate. Hence, in case of selected 20 countries market capitalization cause GDP growth rate. The probability value (0.2070) of F-statistics (1.58215) is unable to reject the null hypothesis that market capitalization does not Granger Cause GDP growth rate. The causality results are in-line with the previous literature like the study by Sattar, Ali, Rehman & Naeem (2018) found the same way of causality in case of three Asian countries.

Table 6: Results of Granger Causality Test: Panel of 20 Countries

Null Hypothesis:	Obs	F-Statistic	Prob.	Conclusion
GDP Growth Rate does not Granger Cause Market Capitalization	360	5.39490	0.0049	Causality
Market Capitalization does not Granger Cause GDP Growth Rate		1.58215	0.2070	No Causality

Mediation Analysis

The next analysis of this study is based on mediation analysis. The study has used the mediation methodology of Hayes (2022) to check the mediation of market capitalization among GDP growth rate and other control variables. Results has been shown in table 6. The study found partial mediation of market capitalization among GDP Growth rate and other control variables i.e. foreign direct investment, gross fixed capital formation, expenditure on education, expenditure on consumption, inflation, GDP per employed person, and exchange rate. The following table shows three outputs which need explanation to discuss the results of mediation model. The total effect is 0.7427 which is significant (p-value=0.000). This total effect is further divided into two parts, direct effect and indirect effect. Direct effect captures the impact of the pathway from the exogenous variable to the outcome while controlling for the mediator. The indirect effect captures the role of mediating factor in the regression analysis. The value of direct effect is 0.0441 which is also significant which confirms the partial mediation of market capitalization among GDP growth rate and other control variables in case of selected 20 countries. The results are in-line with (Aali-Bujari et al., 2017). The diagnostics tests are also valid, the lower bond (-0.00029) and upper bond (0.0027) values are good.

Table 6: Results of Mediation Analysis: Panel of 20 Countries

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		t-statistics	Conclusion
				Lower Bond	Upper Bond		
Independent Variables → Market Capitalization → GDP Growth Rate	0.7427 (0.000)	0.0441 (0.000)	-0.0002	-	0.0027	3.4794	Partial Mediation

CONCLUSION AND POLICY IMPLEMENTATION

This study examined the role of market capitalization in mediating the relationship between economic growth and a few macroeconomic variables, including foreign direct investment, gross fixed capital formation, government education spending, consumption spending, GDP per person employed, exchange rate, and inflation. The research chose nations from three regions: Asia, Europe, and the Mena region. The study also investigated the causal relationship between market capitalization and economic progress in certain countries. The study looked at panel data from twenty countries from 2002 to 2021. The data were gathered from several sources, including the World Bank's World Development Indicators (WDI), International Financial Statistics (IFS), several economic surveys of specific countries, and Central Bank publications. The GDP growth rate has been used as a proxy for economic growth, which is a dependent variable, whereas consumption, government spending, the real effective exchange rate, foreign direct investment, GDP per employed person, gross fixed capital formation, inflation, and market capitalization are independent variables. The study employed Pearson's correlation matrix to analyze the relationship between variables. The results of the unit root test demonstrate a heterogeneous order of integration across all variables.

According to the panel regression results, the economic growth rate will increase by 2% when FDI increases in the selected 20 nations. Furthermore, gross fixed capital formation, education spending, consumer expenditure, inflation, market capitalization, and GDP per employed person all contribute to higher economic growth rates. While a one percent increase in the exchange rate reduces the economic growth rate of those countries by four percent. The value of the Hausman test confirms the existence of a fixed effect model for twenty countries, implying that depending on the heterogeneous characteristics of the countries in the clusters, the role of market capitalization and other independent variables can have varying effects on the country's economic growth. Furthermore, the analysis demonstrated a one-way causal relationship between market capitalization and economic growth. Hayes' (2022) mediation approach demonstrates that market capitalization is somewhat mediated by economic growth rate and other control variables in 20 chosen nations. The study ends with sound policy options based on its empirical findings like providing more friendly policies for investors and businesses, such as developing special economic zones and offering free tax holidays. Moreover, focus on money supply and maintaining the balance of face value and inner value of the currency. Increasing the volume of foreign direct investment increases the demand for labor in the country.

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Appendix-A: List of Selected Countries

Name of the Country	Region	Status
Germany	Europe	Higher Income Country
France	Europe	Higher Income Country
Spain	Europe	Higher Income Country
Austria	Europe	Higher Income Country
Australia	Australia	Higher Income Country
Canada	North America	Higher Income Country
China	Asia	Higher Income Country
India	Asia	Upper Middle Income Country
Malaysia	Asia	Upper Middle Income Country
Poland	Europe	Higher Income Country
Japan	Asia	Higher Income Country
Switzerland	Europe	Higher Income Country
Hungary	Europe	Higher Income Country
Ireland	Europe	Higher Income Country
Turkiye	Europe & Asia	Upper Middle Income Country
Egypt	Middle East & North Africa	Lower Middle Income Country
Jordan	Middle East & North Africa	Upper Middle Income Country
Oman	Middle East & North Africa	Higher Income Country
Morocco	Middle East & North Africa	Upper Middle Income Country
Saudi Arabia	Middle East & North Africa	Higher Income Country

Note: The classification is based on GDP growth rate of 2021 by The World Bank.

Appendix A

Table. ADF Unit Root Test at Level

Country	Variables	Intercept	Lags	Intercept and Trend	Lags	None	Lags	Conclusion
Benin	SMPED	- 2.673949 (0.0012)	1	-4.583750 (0.13670)	0	-2.725794 (0.0893)	1	I(0)
	logSMPED	-2.83482 (0.2678)	1	-2.680710 (0.0603)	0	-0.006278 (0.6734)	1	I(0)
	EXDX	-2.66406 (0.8637)	4	-1.901359 (0.6289)	4	-2.704312 (0.0833)	4	I(0)
	logEXDX	- 0.784634 (0.8107)	0	-2.285874 (0.0801)	1	-2.784008 (0.0797)	0	I(0)
	GRX	- 2.872719 (0.0764)	0	-4.34797 (0.0070)	3	-2.690426 (0.0800)	0	I(0)
Burkina Faso	SMPED	- 2.666309 (0.0693)	0	-2.637601 (0.0862)	0	-3.859522 (0.0004)	3	I(0)
	logSMPED	-2.69656 (0.0685)	0	-2.575535 (0.0645)	0	-1.207812 (0.6038)	1	I(0)
	EXDX	- 0.750645 (0.8169)	0	-2.238986 (0.0506)	0	-2.708728 (0.0919)	0	I(0)
	logEXDX	0.179790 (0.9660)	0	-2.526714 (0.0947)	0	-2.892502 (0.8796)	0	I(0)
	GRX	- 2.550588 (0.0801)	1	-2.878037 (0.0781)	1	-2.550588 (0.0930)	0	I(0)

Source: Author's calculations