Scientific Annals of Economics and Business
73 (X), 2026, 1-25
DOI: 10.47743/saeb-2026-0012

A Pathway towards Sustainable Economic Development: The Role of Stock Market Development from Cross-Country Reference

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Abstract: Stock market is the financial enabler of sustainable economic development as stock market enables the corporations with long-term capital. The aim of this study is to estimate the effect of stock market development on the development of an economy. The article is grounded on the sample of 51 developing and 32 developed countries from the year 1991 to 2022. The study has considered two stock market development indicators i.e., stock market capitalization (MCAP) and listed domestic companies, and applied the panel VAR model. In the short run, both the indicators of stock market development are positively related with the economic advancement of the developed as well as developing countries. Interestingly, investment and government expenditure are adversely associated with the economic progress of developed as well as developing countries. Furthermore, savings and trade are positively connected with the economic development of developing countries whereas this linkage is adverse in the developed countries. Panel causality test reports bidirectional relationship between MCAP and economic performance. This result supports the feedback theory of financial system as MCAP and economic development reinforce each other. Variance decomposition test and IRF are also applied to support the above results. This study is significant for the government and policymakers in formulating effective strategies for developing the stock market and views it as an important avenue for mobilizing the capital towards innovation, sustainable environment and governance practices.

Keywords: stock market development; economic development; Panel VAR; cross-country analysis.

JEL classification: B22; E44; F63; G15.

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Article history: Received 6 May 2025 | Accepted 18 March 2026 | Published online 27 April 2026

To cite this article: Agarwalla, M., Sahu, T. N. (2026). A Pathway towards Sustainable Economic Development: The Role of Stock Market Development from Cross-Country Reference. *Scientific Annals of Economics and Business*, 73 (X), 1-25. https://doi.org/10.47743/saeb-2026-0012.

1. INTRODUCTION

Stock market is viewed as a significant sub-sector of the financial system and is presumed to exert a significant developmental role on the global finance and economy (Adjasi and Biekpe, 2006)). Sound financial system is prerequisite for financial efficiency, financial inclusion, and financial depth. Put differently, financial development enables the corporations with eco-friendly technology, helps in eliminating inequality and poverty which are closely associated with the sustainable economic development (Ahmed *et al.*, 2022; Dutta and Saha, 2023). Well-developed financial sector efficiently allocates the resources towards real sector of an economy by giving the diversification benefits of portfolio, reducing the liquidity risk of financial instruments to investors (Nowbutsing and Odit, 2009). Therefore, advanced stock market facilitates an economy through numerous networks, among them important are capital allocation and total factor productivity (Ang, 2008). Another way, improved financial system accelerates the economic development via improved financial services, liquidity and investment, (Adjasi and Biekpe, 2006; Ho, 2019) upgrading the problem of information asymmetry, human capital development, (Fanta, 2017; Pradhan, 2018) lessening the cost of corporate governance and information cost (Guru and Yadav, 2019). This view is termed as supply-lending hypothesis in the literature (Calderón and Liu, 2003; Ibrahim and Alagidede, 2018; Pradhan, 2018; Taddese Bekele and Abebaw Degu, 2023).

Another view in this regard figured out that, economic development through an enhanced demand for financial services acts as a chief driving force of financial sector development (Mtar and Belazreg, 2023). As enhanced demand for financial services emerges more financial products, services, intermediaries and financial institutions (Ang, 2008). Additionally, economic growth generates surplus in the economy, which supports in fueling the financial sector (Pan and Mishra, 2018). This view is termed as demand-following hypothesis (Calderón and Liu, 2003; Pradhan, 2018).

The rising status of stock market throughout the globe has recognized the fact that finance is a crucial element of growth. Healthy stock market of a nation assists the corporates and enhances their efficiency and financial strength (Zhang *et al.*, 2011). Development of stock market is defined as in terms of expand of size, liquidity and stability of the market along with greater access to the market which can provide several advantages to the economy (Guru and Yadav, 2019). Otherwise, the role of equity market in the advancement of an economy is measured by the volatility level of share market (Pan and Mishra, 2018). As more fluctuations in the market may be the reason of scams in the market which reduces the credibility of the market in the eyes of investors. Financial development generally affects the economic development directly through the expenditure channel and indirectly through the inflation (Pradhan *et al.*, 2014). Ibrahim and Alagidede (2018) opined that financial sector enlargement hampers the economic progress when there is a disproportionate growth of real and finance sector output.

Well-developed financial system, specifically stock market of a country helps in efficiently mobilizing foreign capital and domestic savings (Pan and Mishra, 2018; Mehmood and Bilal, 2024) toward the productivity of real goods and services. Second, an efficient stock market assists the institutions through the adoption of modern technology and by the provision of financial facilities and other related financial services. Third, stock market creates an avenue for the corporations to meet their financial requirements in an efficient and inexpensive way. Fourth, developed stock market helps in increasing the transparency and

reporting standards; funds innovation and green environment and shifts its funding towards ESG (environment, social and governance) stocks, which are directly aligns with the targets of sustainable development goals (SDGs). Therefore, it is perceived that stock market acts as an engine in the growth of corporations and ultimately sustainable economic development.

Developed and developing country's economy carries varied characteristics in terms of social, political, geographical, environmental, financial and other related factors. Share prices reflect all these factors related to the economy. These above stated factors influence the level of development in the dissimilar manner. Considering these factors, government, stock market regulators, stock market analysts and policymakers regulate the financial sector through various policy decisions and reforms. So, it is also important to empirically analyse the nexus in the framework of developed and developing country's economy separately. This study is framed to cover the gap of the existing literature through various paths. Firstly, this study shows the linkages of stock market development (hereafter, SMD) with the development of an economy. Second, it shows the degree of effect, magnitude and causal direction among the economic development, SMD parameters and various macroeconomic control variables. Third, this study is focusing on the large number of developed countries as a group and developing countries as a group so that generalisation of the results is possible. Fourth, in empirically analysing the results, this study considers four macroeconomic variables (investment, public expenditure, savings and trade) as control variables for the robustness of the result. As, these macroeconomic indicators have an influence on the stock market as well as on the overall economy.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In many countries' economy, due to the unavailability or constraints in debt finance, the importance of equity market is rising for raising the funds by the corporates. In the prevailing literature, there is no harmony concerning the association of SMD and real economy as the association varies from one nation to another depending on the institutional factors, macroeconomic factors, firm level factors, structural factors, technological, global and other factors.

Nowadays, the need of stock market is growing around the world as it efficiently allocates the savings toward the productivity of real output, which eventually leads to the sustainable economic development. Stock market provides liquidity of the investment amount, diversification benefit and information to the investors. Many researchers argue that, stock market capitalization does not truly capture the picture of the real economic situation as it is largely driven by the share prices of the big multinational companies (Pan and Mishra, 2018).

In the research executed in the scope of 12 MENA region countries, Ben Naceur *et al.* (2007) have found that, savings rate, stock market liquidity and financial intermediaries are a significant positive element of the SMD. According to Yartey (2010), good quality of institutions, economic growth, domestic investment and stock market liquidity are substantial elements for developing the stock market. Taking quarterly data over the period from 2001Q4 to 2016Q4, Ho and Odhiambo (2018) have identified the various macroeconomic determinants of SMD in the Philippines. Through ARDL approach, the study highlighted that, trade openness adversely affects the SMD in the long period of time. In another study, Pradhan *et al.* (2020) have investigated that, development of equity segment and bond market are cointegrated with the economic progress, interest rate and inflation rate of G-20 countries. Share market liquidity

and size are positive contributors in the mobilization of savings and mitigation of risk with the easiness of share trading in the developing economy of Nepal (Bhattarai *et al.*, 2024).

Kassimatis and Spyrou (2001) have found in the economies of India and Taiwan that, stock market adversely affects the economic expansion rate but in South Korea, equity market is effective in promoting the economic development. Osinubi and Amaghionyeodiwe (2003) have assessed the nexus between Nigerian SMD and economic progress and exposed that indicators of SMD does not pose significant impact on the economic expansion. By applying quarterly data from the period 1979Q1 to 1998Q4, Caporale *et al.* (2005) have exposed that, in the long term, SMD accelerates the economic progress rate through the channel of investment productivity in the less developed countries. Positive correlation of economic growth with the Ivorian SMD index, FDI, public investment, development aid and expenditure has been showed by the N'Zué (2006). On the one hand, Deidda (2006) has exposed that, the connection between finance and growth is strongly positive in the relatively developed economies. On the other side, this connection is much weaker in the comparatively less developed countries. In the same year, Nieuwerburgh *et al.* (2006) have confirmed that advancement of stock market caused the economic progress specifically between the perioud 1873 and 1935. In the region of MENA, Naceur and Ghazouani (2007) have considered the nexus between bank, equity market and economic growth and infer no significant association between bank and SMD and economic progress. In Egypt and South Africa, Enisan and Olufisayo (2009) have studied the favorable long-run impact of SMD on economic progress. Though, weak sign of growth induced finance is evidenced in Nigeria, when market size is taken as a parameter to gauge the SMD. Interaction between financial development and economic progress through the dynamic panel GMM model was tested by Fung (2009) and reported the convergence to growth path in both financial development and per capita GDP of high and middle-income countries. Besides, in high-income economies, economic freedom positively affects the growth path of financial development and per capita GDP.

Choong *et al.* (2010) have investigated that, in emerging countries, market capitalization (MCAP) is adversely associated with the economic progress but another measure of stock market i.e., total stock value traded is positively associated. In developed countries both, value of traded stocks and MCAP are positively linked with the economic growth. Over the period 1995-2010, based on Granger causality test, Carp (2012) attempts to evaluate the bondage of SMD with the economic progress. Experiential results indicated that, MCAP and value traded does not influence the economic progress rate of Romania. In the same year, Yu *et al.* (2012) have noticed a slower rate of economic progress despite the development of financial and stock market in the short term in underdeveloped countries. In the context of ASEAN nations, Pradhan *et al.* (2014) have conducted the study and observed that, a sophisticated stock market is indispensable for the smooth operating of overall financial system and to elevate the productivity and investment level in the economy, which will further enhance the growth level and attracts the FDI in the economy. Later on, Ngare *et al.* (2014) have found that countries having relatively developed stock market, tend to grow slower than the stock market of less developed countries. Interestingly, Palcau and Pop Silaghi (2025) have experienced that, nations with stock market oriented financial sector, exhibits strong causal nexus towards economic growth from the stock market. By taking three pointers of development of equity market into consideration i.e., MCAP, turnover ratio and value of traded shares, Naik and Padhi (2015) have checked the impact of these on the growth rate of GDP. In the context of 27 emerging economies the research reported that, all three equity market development parameters significantly contributed towards the growth of an economy.

In the framework of 34 OECD countries, Pradhan *et al.* (2015) have found that in the long-term, SMD does not spur the further economic growth. From CCE and AMG estimation, Durusu-Ciftci *et al.* (2017) have reported that, SMD positively impacts the economic growth of financially developed stock market-based economies and this impact is found insignificant for some other countries. In a quite similar study, Nyasha and Odhiambo (2017) have stated that, stock market based financial development has a favorable impact on the economy of Kenya. However, Fanta (2017) has revealed that, in developed economies, bond markets are more paying towards the economic growth as compare to stock market and banks. But the same is not true for developing economies. In line with the other studies, Pan and Mishra (2018) have figured out the several channels by which financial markets drive the economic advancement of Chinese economy. Within the framework of ARDL bound test, Qamruzzaman and Wei (2018) have confirmed that, three undertaken indicators of equity market development are enhancing the economic growth. Among macroeconomic control indicators, investment and government expenditure shows positive relationship however, inflation shows an adverse relationship with the economic growth.

Krinichansky and Sergi (2019) have presented that, financial development upsurges the economic progression of Russian's region through productivity growth. In the same manner, Guru and Yadav (2019) through generalized method of moment estimation have stated that, when value of shares traded regressed as a gauge of financial development, then it is rising the economic progress. But when turnover ratio is regressed then the result does not remain same. Along these lines, Yang (2019) has categorized the countries as high-income group, middle to high graduates and middle-income group to check the consequence of financial development on the economic progress. The study observed that, SMD has a strong positive impact on the growth of all three categories of economies. Linkages among monetary stability, financial stability and growth have empirically searched by the Apostolakis and Papadopoulos (2019). Bidirectional causality is marked between financial stress and GDP and between inflation and economic growth. Moreover, positive shock in financial stress has an adverse impact on all the macroeconomic indicators. Cave *et al.* (2020) have revisited the issue and terminated that, positive relationship is observed between SMD indicators and economic growth up to a fixed level but beyond that this relationship becomes negative. In both advanced and developing economies, financial development promotes environmental sustainability (Kirikkaleli and Adebayo, 2021).

Dabwor *et al.* (2020) have evaluated the impact of share market volatility on the economy of Nigeria and resulted the insignificant bearing of share market returns on the economic progress. Throughout the period 1996-2018, Fakudze *et al.* (2022) have revealed through the ARDL test, the presence of association (long-run) between financial expansion and economic advancement. Employing FMOLS and DOLS models, Ahmed *et al.* (2022) have asserted that, both financial development and institutional quality are positively and in a significant manner related with the green growth of South Asian Countries. More recently, Ibrahim *et al.* (2022) have documented the threshold point of inflation, below which financial development accelerates the economic progress rate. But, beyond that threshold point, inflation weakens the power of financial development in effecting the level of economic progress. Based on the above drawn literature, the following hypotheses are stated:

H*$_1$: Stock market capitalization does affect the economic development.*

H*$_2$: The numbers of listed domestic companies do affect the economic development.*

3. DATA AND METHODOLOGY

3.1. Data

This study is undertaken with the aim to find out the effect of SMD on the economic development of 83 countries worldwide in the presence of some control variables. These 83 countries are separated into 51 developing and 32 developed countries for the empirical results. List of all the developed and developing countries are reported in Annex. In the study developed and developing countries are taken as per the accessibility of data. The classification of developed and developing countries are as per the report of "World Economic and Prospects (2022)", United Nations (Sidek and Asutay, 2021; Agarwalla and Sahu, 2025). Annual data of all the variables are considered over the time period of 1991 to 2022. The time period is considered following the era of post-liberalisation. As liberalisation relaxes the restrictions, trade barriers, laws and regulation, allows the involvement of private sectors (i.e., privatisation), FDIs and overall, integration of domestic economy with the global landscape (i.e., globalisation) has taken place which infuses dynamic competency and expands the activities of financial and real sector. The annual data of all the variables were gathered from "World Development Indicators" of the "World Bank".

For measuring the development of stock market, the present study undertook two measures i.e., 'stock market capitalization' (MCAP) and the 'number of listed domestic companies' (LDC). Besides these explanatory variables, various other control variables are also treated in the model. 'Gross capital formation' is taken here as a measure of investment (GCF), 'general government final consumption expenditure' as a reflector of government expenditure (GE), 'gross savings' and 'trade volume as a percentage of GDP' are taken here as a control variable. The dependent variable of this study is economic development (GDP) proxied by 'per capita gross domestic product'. The dependent variable of this study, that is GDP per capita, is transformed into the log value.

3.2. Methodology

Following the work by Agarwalla and Sahu (2024); Taddese Bekele and Abebaw Degu (2023); Ibrahim *et al.* (2022) and Naik and Padhi (2015), the econometric model to detect the relationship between SMD and economic development in the existence of four control variables (investment, government expenditure, savings and trade) is developed as follows:

$$LnGDP_{it} = \alpha_{0it} + ß_{0it}MCAP_{it} + ß_{1it}LDC_{it} + ß_{2it}GCF_{it} + ß_{3it}GE_{it} + ß_{4it}Savings_{it} + ß_{5it}Trade_{it} + \mu_{it}$$

where i = 1,2,3,4…, N signifies the country of a sample; t = 1,2,3,4…., T indicates the year for each country; α indicates the intercept term, $ß_j$ (here j = 0,1,2,3) denotes the elasticities of economic development concerning market capitalization, listed domestic companies, investment, government expenditure, savings and trade respectively and μ represents random error or disturbance term.

Different statistical and econometric techniques related to the panel data approach are labelled in detail in the following:

3.2.1. Panel Unit Root Test

As we know regression analysis with the non-stationary series leads to false result. Therefore, before any analysis it is required to test the stationarity condition of all the variables to avoid the false result. Following the panel data structure, this study applies three different panel unit root tests viz.: "Levin, Lin and Chu test" (LLC) by Levin *et al.* (2002); "Fisher ADF test" and "Fisher PP test" by Maddala and Wu (1999). Out of these three-unit root tests, LLC considers homogeneity but other two tests by Maddala and Wu (ADF and PP) consider heterogeneity.

3.2.2. Panel cointegration

Following the results of the stationarity test of the variables, if all the variables are stationarity in the same order, then one can apply the cointegration test. In this study we applied the residual-based 'panel cointegration test' of Pedroni (1999) to detect the existence of long-run relationships. The cointegration test of Pedroni is well known, as it presumes independence and heterogeneity into account. The cointegration test of Pedroni is based on the seven test statistics, out of them four are panel based also recognized as within-dimension tests, which considers the common autoregressive coefficients. Another three are group-based test statistics also recognized as between-dimension tests.

3.2.3. Panel Vector Autoregression

In case of non-existence of cointegration between the undertaken variables, one can move towards the PVAR ("Panel Vector Autoregression") model for detecting the short-term relationship. In the VAR model selection of lag length is an important criterion. This model is a multivariate equation model that treats in the system all the variables as endogenous and also considers unobserved individual heterogeneity. Following the Love and Zicchino (2006); Abrigo and Love (2016) this model takes into account the individual sample differences and their impact on the model parameters to appropriately show the interaction among the variables. Unlike the traditional VAR, the PVAR method is more robust as it enhances the estimation sample which allows the result to be more consistent.

3.2.4. Panel Causality Test

The presence of cointegration among the variables implies the existence of causality between at least two variables of interest, although the direction of causality is unknown. For getting the route of the causal relationship between MCAP, LDC, GCF, GE, Savings, Trade and GDP per capita this study has applied the panel VAR causality test.

3.2.5. Robustness Tests

To check the robustness of the causal relationships, the study utilizes Impulse Response Function (IRF), which shows within the system, the response of a variable to the variation in other explanatory variables, while all other shocks are considered as equal to zero.

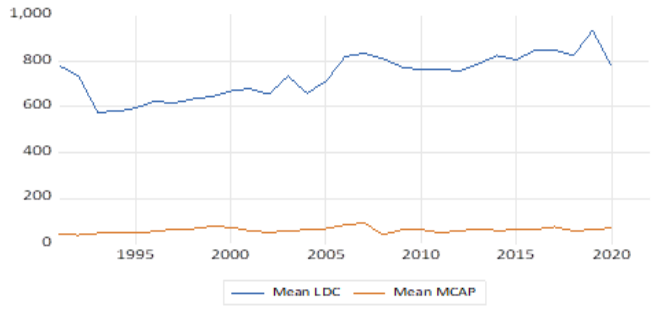
Robustness can also be verified utilizing the variance decomposition analysis (VDA), which accounts for the breakdown of the value of the variable arising from changes in the value of itself along with other explanatory variables in the previous periods. These robustness tests give added support on the existence of causal relationship between the variables.

4. ANALYSIS AND FINDINGS

This section represents the trends and findings of different applied statistical econometric tools namely panel unit root, panel cointegration, panel vector autoregressive, panel causality test, and robustness check (IRF and VDA).

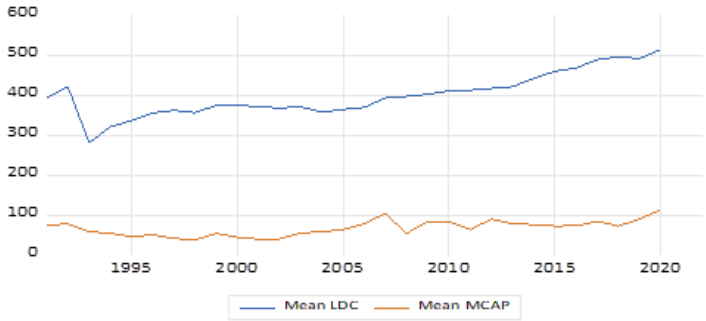
4.1. Trends of MCAP and LDC

In Figure no. 1, the authors display the trend of the means of SMD variables (MCAP and LDC) in the economy of developed nations. From the below figure it is apparent that, in developed economies, the trend of the mean of LDC is increasing with the exception of few years. The volatility of the mean of LDC is high over the years. But the mean value of MCAP is more or less stable throughout the study period and fluctuation in it is less.



Source: prepared by authors

Figure no. 1 – Trend of MCAP and LDC (Developed Countries)



Source: prepared by authors

Figure no. 2 – Trend of MCAP and LDC (Developing Countries)

On the other hand, Figure no. 2 pictured out the same thing as above (Figure no. 1) in developing countries economy. The curve of both mean LDC and mean MCAP are towards the upward direction. In absolute figure, the value of increase in mean LDC is more as compare to the mean of MCAP value. From Figures no. 1 and no. 2 it is clear that, in developing nations, the rate of growth in MCAP and LDC are more as compared to the developed nations. Interestingly, during the timespan of this research work, the difference in the mean value of LDC is too wide in developed and developing economies.

4.2. Descriptive Statistics

In Table no. 1, results of the summary statistics are presented which defines the nature of the variables considered in this study. Mean value of the variable GDP per capita is 10.227 and 8.674 with the standard deviation value of 0.718 and 1.175 in developed and developing countries respectively. It indicates that, in both set of countries inconsistency is not high in the series. In advanced and emerging countries, the average value of market capitalization is 61.169 and 70.182 with a variability of 50.913 and 140.94 respectively. This implies, variability of the variable MCAP is high in emerging countries. In developing countries, the maximum and minimum value of MCAP remains between 1777.2 and 0.009 within the studied timeframe which also supports the above-mentioned result. On the other side, fluctuation of listed domestic companies shows the unstable values of 1299.329 and 855.11 around the mean in advanced and emerging nations respectively. In developed countries, GCF or investment on an average stand at 23.1 with the highest and lowest values of 1.157 and 54.954 respectively. Mean value of government expenditure stands at 19.402 and 14.707 with a steady fluctuation rate of 3.34 and 5.674. The SD value of other control variables i.e., savings and trade are also stable in both types of country sets. Moreover, out of the studied variables, only two variables i.e., GDP per capita and government expenditure are negatively skewed in the result of developed country set but in the developing country set, the only variable savings is negatively skewed.

Table no. 1 – Descriptive Statistics

	Developed Countries						
	LnGDP	**MCAP**	**LDC**	**GCF**	**GE**	**Savings**	**Trade**
Mean	10.227	61.169	728.475	23.100	19.402	22.753	97.584
Median	10.398	46.418	174.500	22.910	19.332	22.421	79.170
Maximum	11.629	321.935	8090.0	54.954	30.323	50.921	388.120
Minimum	8.171	0.023	0.000	1.157	10.424	4.661	15.810
Std. Dev.	0.718	50.913	1299.329	4.088	3.340	6.062	62.479
Skewness	-0.654	1.472	2.740	0.633	-0.098	0.332	1.865
Kurtosis	3.020	5.625	11.263	8.177	3.127	3.704	7.185
	Developing Countries						
Mean	8.674	70.182	402.094	24.613	14.707	24.216	86.099
Median	8.556	34.97	163	23.327	13.957	23.383	72.375
Maximum	11.765	1777.22	5999	48.869	76.222	66.884	442.62
Minimum	6.215	0.009	2.00	5.359	0.911	-236.24	13.753
Std. Dev.	1.175	140.94	855.11	7.381	5.674	13.231	64.478
Skewness	0.379	6.75	4.578	0.647	1.551	-5.321	2.868
Kurtosis	2.552	57.781	25.789	3.146	13.869	109.115	13.046

Source: prepared by authors.

4.3. Panel Unit Root

The results related with the integration order of the variables are stated in Table no. 2. Out of the applied three test statistics, the variable MCAP is stationary at level as per the results of only one test statistic i.e., LLC in developing country set. Another variable, LDC is stationary at level in developed sample set according to the result of only one test statistic out of three, at 5% level of significance. Whereas, in both developed and developing sample sets, all the seven variables become stationarity after the first difference or otherwise, it is said that they are integrated of I(1). In the nutshell, we can say that all the studied seven variables are found to be non-stationary at level and they become stationary after their first difference in both types of sample set.

Table no. 2 – Panel Unit Root Test Result

Variables	Levin, Lin & Chu		Fisher - ADF		Fisher - PP		Order of Integration
	Level	1st Difference	Level	1st Difference	Level	1st Difference	
Developed Countries							
LnGDP	12.86	-11.42***	0.94	253.67***	0.62	460.69***	I(1)
MCAP	-1.31	-24.47***	63.02	574.89***	66.15	848.44***	I(1)
LDC	-2.06**	-15.92***	74.14	364.06***	71.90	551.24***	I(1)
GCF	-0.18	-24.30***	35.51	625.58***	43.26	862.12***	I(1)
GE	0.29	-23.14***	37.66	577.83***	32.19	687.99***	I(1)
Savings	0.76	-20.89***	33.77	503.86***	37.92	810.23***	I(1)
Trade	7.28	-21.30***	5.85	509.86***	3.16	705.45***	I(1)
Developing Countries							
LnGDP	12.43	-11.80***	10.27	460.82***	8.10	717.05***	I(1)
MCAP	-3.73***	-23.96***	106.01	724.26***	122.44	1283.6***	I(1)
LDC	0.85	-20.00***	75.49	547.65***	83.65	691.63***	I(1)
GCF	-1.34	-29.16***	80.97	907.60***	88.09	1607.9***	I(1)
GE	0.51	-27.94***	68.70	836.93***	94.17	1258.3***	I(1)
Savings	-0.68	-27.68***	81.09	841.24***	107.10	1459.0***	I(1)
Trade	0.79	-28.43***	55.48	861.19***	55.06	1698.3***	I(1)

Note: ***Signify statistical significance at 1% level and ** at 5% level.

Source: prepared by authors

4.4. Correlation Matrix

Correlation shows the relationship between the variables considered in the study. From the Table no. 3 it seems that, in the developed countries data set, all the response variables are positively related with the GDP per capita, except the GCF and GE, which are negatively related but this relationship with GCF is not significant. In developing country's data set, all the explanatory variables are positively correlated with the response variable i.e., GDP per capita except the LDC. Moreover, the table shows, explanatory variables are not highly correlated among themselves in the case of both set of countries.

Table no. 3 – Correlation Matrix

Variable	LnGDP	MCAP	LDC	GCF	GE	Savings	Trade
Developed Countries							
LnGDP	1						
MCAP	0.64***	1					
LDC	0.242***	0.416***	1				
GCF	-0.040	0.036	-0.053	1			
GE	-0.09***	-0.33***	-0.19***	-0.16***	1		
Savings	0.433***	0.279***	-0.13***	0.475***	-0.13***	1	
Trade	0.099***	0.004	-0.41***	-0.054	-0.12***	0.116***	1
Developing Countries							
LnGDP	1						
MCAP	0.335***	1					
LDC	-0.09***	0.237***	1				
GCF	0.002	-0.0105	0.339***	1			
GE	0.281***	-0.08***	-0.13***	-0.18***	1		
Savings	0.247***	0.147***	0.293***	0.523***	-0.24***	1	
Trade	0.428***	0.636***	0.029	0.106***	-0.09***	0.315***	1

Note: ***Signify statistical significance at 1% level.

Source: prepared by authors

4.5. Panel cointegration

Undertaken all the variables of this study are integrated of the same order i.e. I(1), which advocates the implementation of a panel cointegration test. Based on the results gained from the cointegration test of Pedroni in Table no. 4, in developed countries set, out of eleven (comprised of weighted and unweighted) statistics, the p-values of only two statistics are less than 0.01 when we consider both of intercept and trend. Moreover, when we consider only intercept or none of the intercept and trend, then the probability value of none of the statistics is statistically significant.

In developing country's data set, when both intercept and trend is taken into consideration, then only three statistic values (out of eleven) are significant. Not even a single statistic value is significant when we take into consideration none of the intercept and trend. Further, in the existence of only intercept, only one statistic (group PP-statistic) is significant at 1% level. Overall, Pedroni's panel cointegration test assures the absence of cointegration among the variables in both developed and developing country's data sets.

Table no. 4 – Pedroni's Panel Cointegration Test Result

Estimates	Developed Countries			Developing Countries		
	IT	**I**	**None**	**IT**	**I**	**None**
Common AR coefficients						
Panel v-Statistic (unweighted)	13.252*** (0.0000)	-2.285 (0.9889)	-7.562 (1.0000)	19.386*** (0.0000)	-3.851 (0.9999)	-8.969 (1.0000)
Panel v-Statistic (weighted)	9.976*** (0.0000)	-2.074 (0.9810)	-7.647 (1.0000)	4.566*** (0.0000)	-5.135 (1.0000)	-9.078 (1.0000)
Panel rho-Statistic (unweighted)	7.118 (1.0000)	5.134 (1.0000)	3.743 (0.9999)	7.963 (1.0000)	4.933 (1.0000)	5.287 (1.0000)
Panel rho-Statistic	7.109	5.362	2.656	7.504	6.073	5.380

Estimates	Developed Countries			Developing Countries		
	IT	I	None	IT	I	None
Common AR coefficients						
(weighted)	(1.0000)	(1.0000)	(0.9961)	(1.0000)	(1.0000)	(1.0000)
Panel PP-Statistic	2.541	0.924	1.503	2.707	-0.889	2.198
(unweighted)	(0.9945)	(0.8225)	(0.9337)	(0.9966)	(0.1868)	(0.9860)
Panel PP-Statistic	3.342	2.064	-0.928	0.648	0.335	2.702
(weighted)	(0.9996)	(0.9805)	(0.1766)	(0.7418)	(0.6313)	(0.9966)
Panel ADF-Statistic	3.550	2.422	4.196	1.777	3.563	5.747
(unweighted)	(0.9998)	(0.9923)	(1.0000)	(0.9623)	(0.9998)	(1.0000)
Panel ADF-Statistic	3.984	3.563	1.022	2.276	2.070	5.856
(weighted)	(1.0000)	(0.9998)	(0.8467)	(0.9886)	(0.9808)	(1.0000)
Individual AR coefficients						
Group rho-Statistic	8.802	7.550	6.017	9.569	8.704	7.238
	(1.0000)	(1.0000)	(1.0000)	(1.0000)	(1.0000)	(1.0000)
Group PP-Statistic	0.488	0.510	-0.886	-3.776***	-2.506***	-1.792
	(0.6875)	(0.6950)	(0.1875)	(0.0001)	(0.0061)	(0.0365)
Group ADF-Statistic	3.840	3.153	2.990	1.251	2.254	4.934
	(0.9999)	(0.9992)	(0.9986)	(0.8947)	(0.9879)	(1.0000)

Note: ***Signify statistical significance at 1% level. Values in parentheses signify the prob. values of coefficients. IT= Intercept and Trend, I= Intercept, None= No Intercept or Trend.

Source: prepared by authors

4.6. Panel Vector Autoregression

The outcomes associated with the Panel Vector Autoregression (PVAR) are described in Table no. 5. In developed countries, both the measures of SMD i.e., MCAP and LDC are positively related with the economic development and this result is significant at 1% level. In details, in the short-term, if market capitalization goes up (down) by one-unit, economic development will grow (fall) by 0.035 percent. Besides this, investment, government expenditure, savings and trade all are negatively associated with the economic development of developed countries.

In developing countries, in the short-term, both the SMD indicators i.e., MCAP and LDC are also positively interrelated with the economic advancement and this result is significant at 1% level. If market capitalization goes up (down) by one-unit, economic development will grow (fall) by 0.012 percent. Additionally, investment and government expenditure are adversely linked with the economic development. Savings and trade exert positive impact on the economic development. This signifies that when savings rise in the economy by one unit, then economic development goes up by 0.0368 percent.

Table no. 5 – Panel VAR Result

Dependent variable: LnGDP		
Variables	**Developed Countries**	**Developing Countries**
LnGDP (-1)	1.34488*	1.43745**
	(0.05321)	(0.03863)
LnGDP (-2)	-0.35833*	-0.44111**
	(0.05247)	(0.03853)
MCAP (-1)	0.00035***	0.00012***
	(4.8E-05)	(2.7E-05)

Dependent variable: LnGDP		
Variables	**Developed Countries**	**Developing Countries**
MCAP (-2)	-0.00035***	-0.000155***
	(5.0E-05)	(2.8E-05)
LDC (-1)	3.90E-06***	5.77E-06***
	(7.0E-06)	(2.2E-05)
LDC (-2)	-3.70E-06***	-2.52E-06***
	(7.0E-06)	(2.1E-05)
GCF (-1)	-0.00022***	-0.000993***
	(0.00068)	(0.00047)
GCF (-2)	-0.00107***	0.000757***
	(0.00065)	(0.00046)
GE (-1)	-0.00194***	-0.000732***
	(0.00178)	(0.00120)
GE (-2)	0.00156***	0.000456***
	(0.00176)	(0.00117)
Savings (-1)	-0.00076***	0.000368***
	(0.00055)	(0.00038)
Savings (-2)	0.00157***	2.46E-05***
	(0.00056)	(0.00038)
Trade (-1)	-0.00011***	5.91E-06***
	(0.00017)	(0.00014)
Trade (-2)	0.00012***	-7.02E-06***
	(0.00017)	(0.00014)

Note: ***Signify statistical significance at 1% level, ** at 5% level and * at 10% level. Values in parentheses denote the prob. values of coefficients. Lag length selection: Schwarz Information Criteria.

Source: prepared by authors

4.7. Panel Causality Test

Panel VAR causality test is employed in this study to know the direction of causal relationship between the variables. The result associated with the panel causality test is shown in Table no. 6. As per the result of developed countries data set: bi-directional causal relationship is found between (i) economic development and market capitalization (this observation is dissimilar with the N'Zué (2006); Enisan and Olufisayo (2009) where they found one-way causality from SMD to growth) (ii) economic development and gross capital formation (Carp (2012) observes the one-way causality from investment to economic growth in Romania) (iii) MCAP and LDC (iv) market capitalization and savings. A unidirectional causal relationship is observed from (i) savings to economic development (ii) savings to GCF (iii) MCAP to GCF (iv) trade to gross capital formation (v) government expenditure to savings and (vi) market capitalization to trade. Moreover, the joint influence of all the seven variables on the GDP per capita, market capitalization, GCF, GE, savings and trade are also statistically significant at 1% level.

In developing countries data set: The incidence of bi-directional causality is seen between (i) economic development and MCAP (ii) economic development and savings (iii) economic development and trade. Besides it, one-way causal relationship is noticed from (i) GCF to economic development (ii) MCAP to LDC (iii) GCF to LDC (iv) market capitalization to GCF (v) savings to GCF (vi) market capitalization to trade (vii) GCF to trade and (viii) government expenditure to trade. The joint influence of all the seven variables on the GDP per capita, listed domestic companies, GCF and trade are statistically significant.

Table no. 6 – Panel Causality Test

Developed Countries							
Independent Variables	**Dependent Variables**						
	LnGDP	**MCAP**	**LDC**	**GCF**	**GE**	**Savings**	**Trade**
LnGDP	-	5.62*	0.29	59.3***	15.3***	4.10	3.50
MCAP	58.3***	-	10.3***	55.1***	50.9***	34.0***	47.7***
LDC	0.33	5.0*	-	0.84	1.25	2.30	0.39
GCF	15.5***	4.06	0.84	-	4.73*	4.64	1.03
GE	1.84	2.69	0.32	0.04	-	7.82**	0.53
Savings	14.3***	11.0***	1.11	33.1***	0.87	-	1.63
Trade	0.54	1.89	2.07	7.21**	1.60	1.51	-
Overall	82.6***	34.4***	15.18	164***	81.1***	62.0***	65.4***
Developing Countries							
Independent Variables	**Dependent Variables**						
	LnGDP	**MCAP**	**LDC**	**GCF**	**GE**	**Savings**	**Trade**
LnGDP	-	4.92*	3.47	3.31	1.53	8.0***	8.01**
MCAP	31.0***	-	17.6***	16.8***	1.66	4.12	78.9***
LDC	3.84	3.77	-	1.06	1.28	3.68	0.36
GCF	4.65*	2.81	14.3***	-	3.56	4.40	9.89***
GE	1.17	1.07	0.22	2.29	-	0.41	6.78**
Savings	6.51**	0.30	4.31	23.8***	0.81	-	0.15
Trade	4.65*	1.54	3.74	1.44	3.80	1.34	-
Overall	57.9***	14.77	52.7***	55.3***	11.35	18.49	106.3***

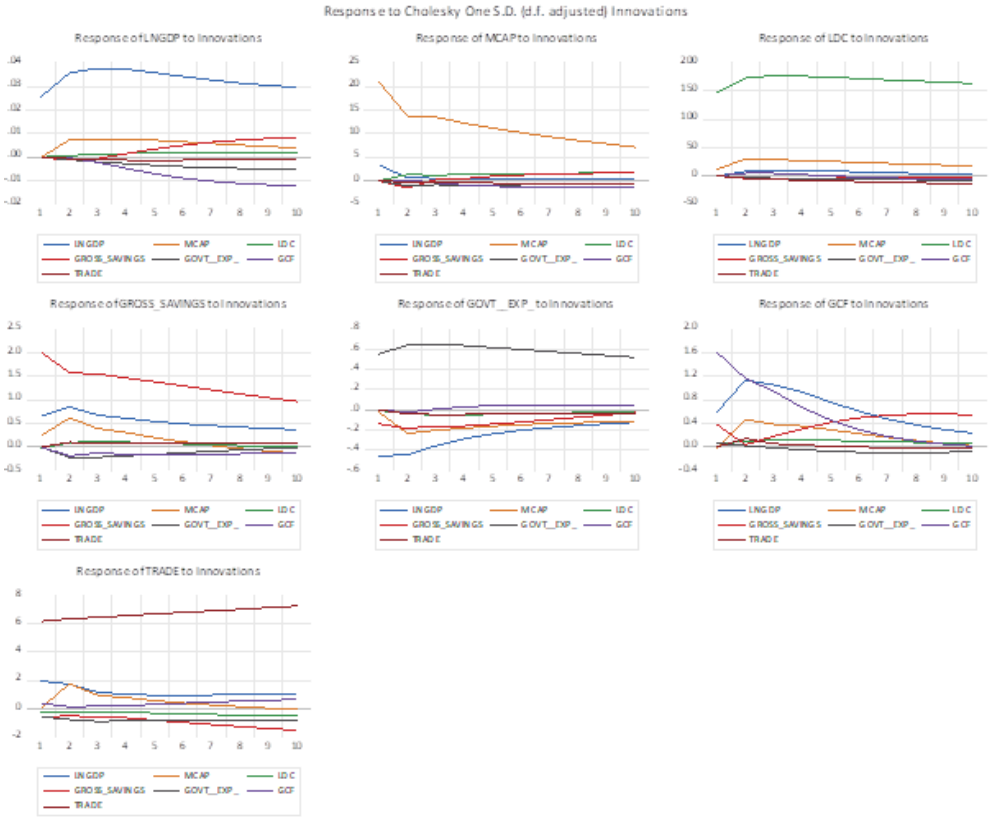
Note: ***Signify statistical significance at 1% level, ** at 5% level and * at 10% level.

Source: prepared by authors

4.8. Impulse Response Function

GIRF ("Generalized Impulse Response Function") focuses further insight into how shocks to each variable can impact and be impacted by the shocks in other variables considered in the study. The outcome of the PVAR model GIRF in the context of developed countries data set is plotted in Figure no. 3. The below drawn Figure no. 3 is the combination of seven individual figures. These seven individual figures depict the response of each variable for the shocks in all the variables considered in the study. From the figure, it is observable that, shocks are becoming disappeared after the period of 5 years (except the variable GCF). It is also clear that, own shock of the variable matters great among other variables in fluctuating the variable except the instance of GCF. In case of GCF, in the initial periods, own shocks affect highly but with the time being along with own shocks, shocks of other variables affect greatly.

Figure no. 4 is the GIRF for the developing sample set. The figure depicts that, in the instance of majority of the variables, the shocks are minimized in the long time frame (i.e., after the period of 5 years). Furthermore, in the case of all the seven variables, maximum variation in the variable is caused by the shock in the said variable. This analysis serves added support for the calculated above results of the test statistics.



Source: prepared by authors

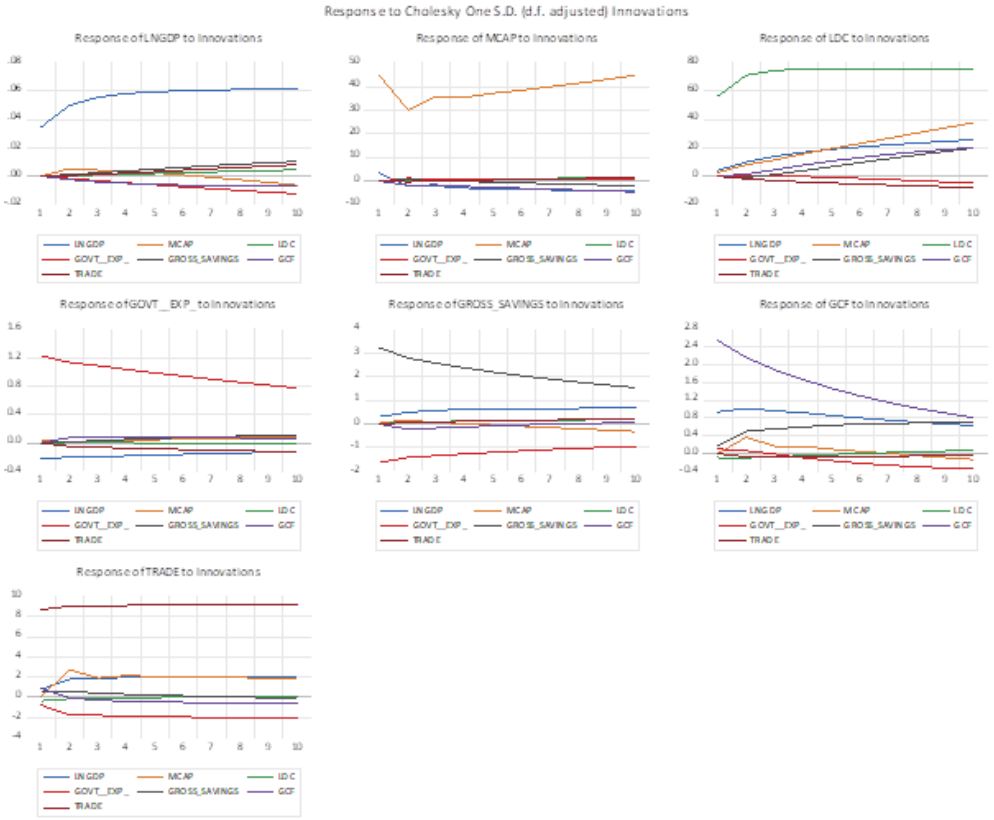
Figure no. 3 – Impulse Response Function: Developed Countries

4.9. Variance Decomposition Test

This study employs the 'variance decomposition test' (VD) to know the exact percentage variation in the value of a variable due to the shock in own and other variables over time. Tables no. 7 and no. 8 provides the variance decomposition result of the variables (GDP, MCAP and LDC) in the developed and developing economies respectively over 10-year of period.

In developed countries data set (as shown in Table no. 7), own shocks of economic development account for 94.47 and 88.291 percent of the variations over the period of 5 and 10 years respectively. In the instance of LnGDP, the influence of own variable is gradually diminishing from the year 1 to year 10. However, in the case of MCAP and LDC, overall the own impact is reducing, but not in each single year. Moreover, for LDC, the percentage of reduction is very less as compare to LnGDP and MCAP. Economic development accounts for 0.795 and 0.152 percent of the variation in MCAP and LDC respectively in the 10 years of time horizon. In both short and long time period (5 year and 10 year), the highest variation in MCAP and LDC are caused by the LDC and market capitalization respectively. This ensures that, market capitalization and listed domestic companies are interdependent on each other.

In the short run, MCAP has the highest degree of influencing power (3.342 percent) to the economic development. While in the long run, GCF caused the 5.509 percent variations in economic development followed by the MCAP (2.746 percentage point). That confirms that, the effect of MCAP is significant in influencing the development of an economy.



Source: prepared by authors

Figure no. 4 – Impulse Response Function: Developing Countries

Table no. 7 – Variance Decomposition Test: Developed Countries

VD of LnGDP per capita							
Period	**LnGDP**	**MCAP**	**LDC**	**GCF**	**GE**	**Savings**	**Trade**
1	100.000	0.000	0.000	0.000	0.000	0.000	0.000
2	97.108	2.653	0.069	0.008	0.057	0.089	0.012
3	96.362	3.085	0.140	0.152	0.155	0.067	0.036
4	95.523	3.302	0.185	0.582	0.254	0.082	0.068
5	94.470	3.342	0.217	1.269	0.370	0.225	0.103
6	93.236	3.286	0.239	2.110	0.492	0.495	0.138
7	91.923	3.177	0.254	3.014	0.615	0.847	0.168
8	90.623	3.040	0.263	3.907	0.733	1.238	0.192
9	89.401	2.893	0.268	4.746	0.845	1.633	0.210
10	88.291	2.746	0.270	5.509	0.948	2.011	0.222

VD of Market Capitalization							
1	2.413	97.001	0.584	0.000	0.000	0.000	0.000
2	1.745	96.372	1.269	0.001	0.209	0.401	0.000
3	1.384	96.422	1.579	0.030	0.254	0.316	0.012
4	1.178	96.193	1.854	0.126	0.335	0.283	0.027
5	1.044	95.833	2.093	0.239	0.415	0.321	0.052
6	0.952	95.388	2.314	0.366	0.498	0.398	0.081
7	0.888	94.894	2.526	0.491	0.580	0.504	0.115
8	0.843	94.374	2.729	0.612	0.660	0.626	0.153
9	0.813	93.842	2.928	0.724	0.738	0.756	0.195
10	0.795	93.307	3.122	0.828	0.813	0.890	0.241
VD of Listed Domestic Companies							
1	1.83E-05	0.000	99.999	0.000	0.000	0.000	0.000
2	0.115	0.535	99.226	0.045	0.015	0.041	0.019
3	0.175	0.575	99.033	0.055	0.035	0.088	0.036
4	0.206	0.581	98.962	0.046	0.049	0.094	0.059
5	0.212	0.559	98.949	0.036	0.063	0.091	0.086
6	0.205	0.526	98.955	0.032	0.078	0.084	0.117
7	0.192	0.489	98.962	0.032	0.092	0.077	0.153
8	0.178	0.454	98.962	0.035	0.106	0.071	0.191
9	0.164	0.420	98.954	0.041	0.119	0.066	0.232
10	0.152	0.390	98.938	0.047	0.133	0.062	0.276

Source: prepared by authors

In developing countries (Table no. 8), economic development defines 0.760 percent of the total variance in the value of market capitalization whereas it labels 5.592 percent of the variation in the value of LDC in the ahead of 10-year period. Own variation in MCAP accounts for the 98.412 percent of the variation, which is too high. While, only 81.657 percent of the variation is explained by the LDC in the long-time frame. In both long and short run, the contribution of economic development is highest among all other explanatory variables in influencing the market capitalization. Even though, in the short run i.e., over 5 years period, the contribution of economic development is highest (3.496 percent) in fluctuating the listed domestic companies but in the horizon of long year, the contribution of market capitalization is more (8.525 percent) as compared to economic development (5.592). This infers that, development of equity market is very sensitive to the shock in GDP per capita.

Table no. 8 – Variance Decomposition Test – Developing Countries

VD of LnGDP per capita							
Period	**LnGDP**	**MCAP**	**LDC**	**GCF**	**GE**	**Savings**	**Trade**
1	100.000	0.000	0.000	0.000	0.000	0.000	0.000
2	98.958	0.765	0.002	0.173	0.018	0.074	0.006
3	98.659	0.683	0.009	0.360	0.040	0.218	0.028
4	98.316	0.587	0.019	0.511	0.074	0.424	0.066
5	97.930	0.471	0.035	0.640	0.114	0.685	0.122
6	97.475	0.374	0.054	0.751	0.159	0.990	0.194
7	96.948	0.310	0.077	0.843	0.210	1.327	0.281
8	96.349	0.288	0.104	0.919	0.266	1.687	0.384
9	95.681	0.314	0.134	0.978	0.325	2.064	0.500
10	94.949	0.392	0.167	1.023	0.387	2.450	0.628

VD of Market Capitalization							
1	0.531	99.468	0.000	0.000	0.000	0.000	0.000
2	0.547	99.272	0.0004	0.105	0.069	0.0004	0.004
3	0.495	99.302	0.0007	0.136	0.059	0.002	0.002
4	0.554	99.176	0.002	0.200	0.056	0.006	0.002
5	0.601	99.059	0.005	0.265	0.049	0.014	0.004
6	0.646	98.928	0.009	0.336	0.043	0.026	0.007
7	0.684	98.798	0.015	0.409	0.038	0.040	0.012
8	0.715	98.668	0.022	0.481	0.033	0.058	0.019
9	0.740	98.539	0.031	0.553	0.028	0.079	0.027
10	0.760	98.412	0.041	0.622	0.025	0.102	0.037
VD of Listed Domestic Companies							
1	0.523	0.183	99.165	0.126	0.000	0.001	0.000
2	1.369	0.833	97.679	0.065	0.0001	0.007	0.045
3	2.155	1.407	96.260	0.064	0.0014	0.013	0.097
4	2.872	2.165	94.553	0.173	0.006	0.080	0.148
5	3.496	3.023	92.669	0.370	0.013	0.225	0.200
6	4.040	3.981	90.628	0.625	0.023	0.447	0.252
7	4.514	5.020	88.473	0.912	0.033	0.740	0.304
8	4.926	6.131	86.240	1.211	0.043	1.092	0.354
9	5.284	7.302	83.959	1.506	0.053	1.492	0.402
10	5.592	8.525	81.657	1.787	0.061	1.927	0.447

Source: prepared by authors

5. RESULTS AND DISCUSSION

Every country's economy desires a well-developed and sophisticated financial system as sound financial system is essential to flourish the economy (Ang, 2008; Tripathy and Pradhan, 2014; Kirikkaleli *et al.*, 2022). The equity market is the chief driver of financial system in developed countries while the banking sector is the chief driver in emerging countries (Zeqiraj *et al.*, 2020). Trend displays that, growth in MCAP and LDC are higher in developing nations as compare to the developed nations. It indicates that in developing nations, the development of stock market is in upward direction. In this article, both the indicators of SMD (market capitalization and listed domestic companies) exert a positive impact on the economic advancement of advanced as well as emerging nations. This signifies that, a smooth drive towards the development of an economy requires a sound and efficient stock market. The stock market optimizes the mobilization of financial resources into productive sectors, funds innovation which eventually leads to the long-term development of the corporations. This finding is similar with the research of Qamruzzaman and Wei (2018), in Bangladesh; Pradhan *et al.* (2014), in ASEAN countries; Kassimatis and Spyrou (2001), in Taiwan. However, this finding does not match with the study of Yu *et al.* (2012), Pradhan *et al.* (2015), Osinubi and Amaghionyeodiwe (2003). The reason of this contradictory outcome underlines the differences in study period, countries studied, underutilisation of capital market in those economies or already developed stock market. On the other side, Arestis *et al.* (2001) have opined that, volatility in stock market has an adverse effect in the economy of Japan and France and insignificant effect in Germany.

In developed economy, investment and government expenditure exerts adverse impact on the smooth functioning of the economies. When investment and government expenditure

are not used effectively, it suffers the growth by elevating the costs. Moreover, in some circumstances, after touching a certain point, excess investment without technological advancement slows the rate of growth, which is also described in the Solow growth model (Solow, 1956). Therefore, quality of expenditure matters more than the amount. Moreover, after the globalization, especially in developed countries, the role of government has contracted due to the budding private sectors. Additionally, savings also acts as a hindrance in the development of advanced economies. Excess saving of advanced economies is associated with the lower domestic demand. That in real term disrupts the economic equilibrium level. Besides, higher trading declines the economic progression of the advanced countries. This may be due to the saturation level of trading in advanced nations. Otherwise, increasing exposure to import-driven trade growth exposes the economy to vulnerability and global recession and hampers the overall economic performance.

On the other hand, in developing economies, growing savings and trade volume supports the progress of an economy. In emerging nations, development is in the process of upward direction so, more savings and trading volume encourage the functions of corporates in the economy. Moreover, developing countries generally suffers from the acute shortage of capital and modern production techniques. In this circumstance, increased savings helps in fulfilling that gap. Growing savings too helps in deepen the financial segment. On the other side, greater trade volume helps the firms in increasing the production efficiency, exploit economies of scale and ultimately expand its market beyond the boundary. Furthermore, investment and government expenditure dampens the performance of an economy. Actually, immediate return from the investment is not expected in general, specifically in developing economies. As their existing level of technology, institutional quality, infrastructure level and governance system is weak. In real terms, these constraints, stretches the actual return period form the investment. Besides, it is important to control the misuse of public funds. At the same time, it is also true that, composition of expenditure matters a lot. If maximum public expenditure directed towards recurring part, then it creates burden on the government without enhancing the productive capacity. The unfavorable effect of public expenditure on the growth is also supported by Smaoui and Nechi (2017); Ngare *et al.* (2014); Fetai (2018). However, the study of Naik and Padhi (2015); Adjasi and Biekpe (2006) found that investment is a significant variable in impacting the growth of an economy. Overall, it is apparent that, both of the undertaken hypotheses of this study are accepted in the context of both developed and developing countries.

Panel causality test reports bidirectional causality between market capitalization and economic development in both developed as well as in developing countries. This infers that, market capitalization causes the development through the circulation of funds to the corporates and development also causes the market capitalization as developed economy encourages more the participants in the stock market. Additionally, in developing countries, market capitalization causes the LDC but in developed countries, MCAP and LDC cause each other. This outcome is also supported by the variance decomposition test. In developed countries, in the short-run, market capitalization has the highest influencing power in effecting the value of economic development and listed domestic companies have the more power in influencing the value of MCAP. In developing countries, economic development is more influenced by the savings and listed domestic companies are more impacted by the market capitalization. In both kinds of sample set, maximum variation in the variable is caused by the own shocks of the variable. This result is also confirmed by the impulse response function. Additionally, IRF discloses that, the shocks are becoming normalized with the time being.

6. CONCLUSION

Sustainable economic development requires a balance between environmental sustainability and socio-economic progress, all of which are dependent on financial development (Dutta and Saha, 2023). Development happens in the market with the increased number of instruments, institutions and investments. Well organized financial market incorporates dynamic efficiency in the entire system through the structural changes and the technological innovation, which are indispensable for the sustainable economic development. This study is viewing the development of stock market for the advancement of an economy. This study has taken data from the period 1991 to 2022 and estimates the result by taking 51 developing and 32 developed countries.

Panel cointegration test shows that, cointegration relationship does not exist among the undertaken variables in the study. Afterward, panel VAR model shows that, in developed economies, both the indicators of SMD i.e., MCAP and LDC are significant in affecting the economic development positively in the short-run. This outcome implies that, greater the size of equity market, better the economic performance will be. Besides it, all the four control variables (investment, government expenditure, trade and savings) are acts as an obstacle in the development of an economy. On the other side, in developing economies too, both of the size parameters of SMD accelerate the economic activities as greater the size of stock market, boosts the confidence of the investors and diversify the risk. But the difference is that, the impact of MCAP is less influential in developing economies. This indicates that, development is still in progress in developing economies. The study by Abid (2025) in the scope of United States, strongly supported the favorable impact of MCAP on GDP, underscoring the importance of well-developed stock market for economic progress. On contrary to the general agreement, the study found that, investment and government expenditure dampens the rate of economic expansion. Another side, saving and trade volume augments the economic progress rate. In this backdrop, it seems that, both of the undertaken hypotheses (H_1 and H_2) of the study are accepted in the framework of both set of countries.

Panel causality test implies a bidirectional causality between MCAP and economic development means they are related in a cyclical pattern. No causal relationship exists between LDC and economic development in the case of both set of countries. Therefore, when MCAP is taken as a parameter of SMD then feedback theory works. In this regard, the study by Shahbaz *et al.* (2018) has asserted that, in the short term between financial development and economic advancement, there remains a feedback effect. Cao *et al.* (2022) also specifies the feedback causality between economic progress and financial advancement in South Asian Nations. Another way, when LDC is used as an indicator of SMD then neutrality theory works. Unidirectional causality is noticed from market capitalization to trade volume in both type of countries data set. Additionally, in developed countries, both-way causal relationship is also observed between economic development and investment and between market capitalization and listed domestic companies. For supporting the above results, IRF and VDT are also employed. Variance decomposition test confirms that in developing countries, economic development has the highest influencing power in affecting the market capitalization in both long and short run. While, in developed countries, in the short-run, the maximum variation in economic development is caused by the MCAP. In the same manner, in the short-run, the maximum variation in economic development is caused by the MCAP. Hence, this confirms that MCAP and economic development are closely associated.

6.1. Policy Implications

Therefore, based on the above result, policymakers, financial researchers and market analysts are requested to implement the appropriate regulations, undertake the reforms, and liberalize the rules and regulation so that participants will be encouraged in entering the stock segment and instinctively consider the platform of stock market as an avenue for facilitating the circulation of funds in the economy. Second, emphasis should be placed on expanding the size of stock market so that, stock market enables the corporations with the easy access of long-term funds and helps them in attaining the targets of SDGs. Third, the results suggest that reducing inefficient government expenditure and diversion of more public funds toward capital expenditure may support smoother economic functioning. Fourth, less involvement of government in economic operations is desirable especially for the developed nations as degree of adversity is more in developed nations. Fifth, developed nations are requested to shift savings toward strategic industries and develop supply chain resilience for derive the positive outcome from it. Sixth, increase of trade volume mainly through the export activities and encourage of private savings through different initiatives like, increasing interest rate etc. is needed for achieving the progress of developing economies.

6.2. Limitations

The reliance on only two SMD indicators (MCAP and LDC) in this research work omit the aspects like liquidity (turnover ratio) or volatility. The study acknowledges this but should treat it as a limitation. Moreover, segregation of government expenditure (like capital expenditure and current expenditure) helps in more accurately targeting the issues. More the number of control variables in the study, enhances the robustness of the study. Overall, individual country-specific study will provide the better result and helps in framing the tailored policies accordingly.

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ANNEX

List of Developed and Developing Countries undertaken in study

Developed Countries	Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czechia, Denmark, Finland, France, Greece, Germany, Hungary, Ireland, Italy, Japan, Luxembourg, Malta, New Zealand, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United States, United Kingdom.
Developing Countries	Argentina, Bangladesh, Bahrain, Barbados, Bermuda, Brazil, Chile, China, Colombia, Costa Rica, Cote d' Ivoire, Eswatini, Ghana, Hong Kong, India, Indonesia, Iran, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Korea Republic, Kuwait, Lebanon, Malaysia, Mauritius, Mexico, Morocco, Namibia, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Qatar, Russian Federation, Singapore, Saudi Arabia, South Africa, Sri Lanka, State of Palestine, Thailand, Tunisia, Turkey, United Arab Emirates, Ukraine, Vietnam, Zambia.

Note: Developed and developing countries are according to the report of World Economic and Prospects (2022), United Nations.