IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 16, Issue 6 Ser. 1 (Nov. – Dec. 2025), PP 113-119
www.iosrjournals.org

Impact of Trade Openness and FDI on Economic Growth in Low-Income Countries

Yashila Sharma[1] Sanjeet Singh[2]
[1]*PhD Scholar, Department of Economics, Central University of Himachal Pradesh*
[2]*Professor, Department of Economics, Central University of Himachal Pradesh*

Abstract: *The paper analyses the connection between trade openness, foreign direct investment and economic growth in low income countries using panel data between 1990 and 2020. It is analysed using a balanced panel of eight low income economies and a dynamic panel estimation framework is used to estimate short-term adjustments and long term relationships. Empirical approach is flexible and permits variances between nations and varied time frames, which make it a favourable environment to examine dynamics of growth. The results show that openness to trade leads to the reduction of the economic growth in the long run and this implies that increased exposure to international trade does not necessarily result in growth benefits to the low income countries. Contrastingly, there is a positive and significant relationship between foreign direct investment and economic growth in the various periods of time. The proxied gross capital formation is also positively related to growth, which is why it is imperative to focus on internal capital accumulation. This study offers country-specific evidence on the relationship between external economic engagement and the growth performance because it targets low income countries. Its findings highlight the importance of cautious evaluation of openness-based approaches in those economies that experience structural limitations that are long-term.*
Keywords: *Trade Openness, FDI, Economic Growth, CS-ARDL, Panel Data*

I. Introduction

The issue of growth continues to be at the centre stage of low income countries where a significant percentage of the population remains vulnerable to unemployment, poverty and economic difficulties. Even as numerous measures have been and continue to be taken at building these economies over a period of decades, the growth patterns of many of them remain lopsided. Their poor capacity to produce long-term growth can be hampered by persistent structural issues, such as the lack of diversification, small production bases, and the inability to do this due to weak institutional capacity. Consequently, the living standards are weak and extremely vulnerable to both internal and external shocks.

One of the key aspects of most of the low income economies is that they are more susceptible to fluctuations in the global economic environment. Poor domestic savings, inadequate financial economies and low industrialisation often compel dependence to external sources in order to sustain the economy. Meanwhile, reliance on a small number of commodities or low value added operations puts one at risk of changes in price and changes in outside demand. These features imply that the results of growth tend to be influenced by the forces originating outside of the countries, which supports the significance of studying the interactions of external involvement and the internal circumstances.

Greater interaction with the world economy is a trend that has been strongly advocated over the last few decades as one of the ways through which growth opportunities can be enhanced. This change is accompanied by the policy changes that are designed to open the borders to the international trade and invite the international economic involvement. These reforms have been a change in the external orientation of most low income countries affecting both the production structures, consumption patterns as well as macroeconomic stability. Although these changes have increased the potential of international interaction, issues of their implications on long-term growth are controversial.

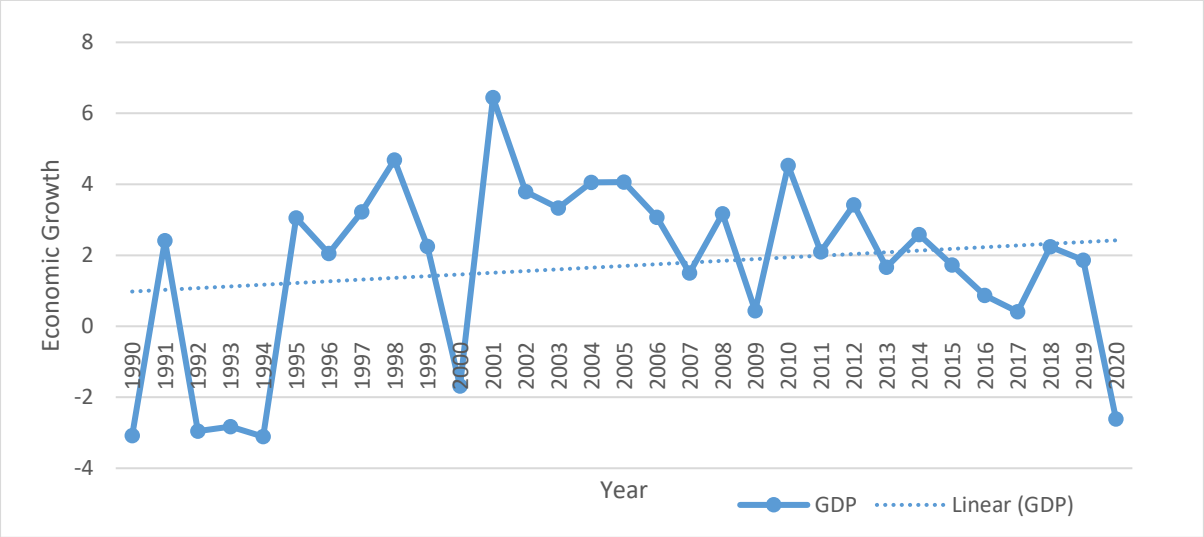
Conceptually, the idea of integrating with the global economy is usually linked to the possible benefits due to the effects of scale, expansion of markets, and the impact of new ideas and practices. Outside interaction can also affect domestic motives by transforming the competition pressure and changing investment choices. Nevertheless, the degree to which these mechanisms can bring about sustainable growth is conditioned by a lot of underlying parts including the productive capacity, the labour market conditions, and the capacity of local institutions to change with evolving economic conditions. Existing vulnerabilities can also be aggravated in the event of increased exposure to external forces in the absence of supportive conditions.

Empirical studies that have been studying the growth consequences of external economic involvement have yielded contradictory results in some instances, especially on low income countries. Whereas in a few cases, the research shows positive results at certain conditions, others show little or possible impact. These conflicting

findings indicate that the growth reactions cannot be homogenous, and can change across the nations and seldom. The variation in structural features, historical backgrounds and policy context complicates the process of making broad conclusions, thus the necessity to analyse the situations contextually.

It is high time to look at the broad trends in the data before estimating them formally. Descriptive analysis is a preliminary view of the development of the main economic indicators through time and allows locating the empirical inquiry in a temporal framework. This way of doing things enables one to appreciate the underlying trends and fluctuations without making assumptions about the cause and effect relationship.

Figure 1: *Trends of Economic Growth*



Source: Author's own calculations

Figure 1 shows the trend of economic growth between 1990 and 2020. The variation between years in the series is significant in the sample period. The contractional periods can be observed in the beginning of 1990s, and then there are the periods of expansion and moderation throughout the rest of the decade. The growth becomes strong in the early 2000s and keeps fluctuating afterwards. The growth in the later years of the sample is positive in various cases but is showing the downward pattern. The linear trend that was fitted indicates a slight long- term increase and constant short-term fluctuations.

Policy decisions are not the only determinants of growth experiences in low income economies because such experiences are influenced by historical developments and structural legacies which change gradually with time. The presence of production concentration, a shallow level of technological penetration, demographic pressures, and the institutional capacity have complex interactions that affect the economic outcomes. These factors tend to precondition the transmission of external economic forces into respective domestic economies and result in different growth reactions of countries and time. Such complexity is relevant in regard to empirical analysis because it highlights the necessity to consider the dynamics of growth in a context-sensitive framework rather than a context-blurring or uniform-assumes framework.

It is in this light that the aim of this paper is to determine by use of empirical evidence how TO and FDI affect economic growth during the 1990 to 2020. The analysis by targeting such a group of economies offers evidence of the association of such external factors with growth outcomes in countries that experience enduring structural constraints.

II. Review of Literature

The recent research on association between TO and FDI and economic growth indicate an increase of the understanding that the outcomes of globalization are quite heterogeneous and contextually conditional. New methods of panel econometrics and the longer data sets it has subsequently made possible allow researchers to shift away from the larger cross-country associations and instead construct country clusters, institutional conditions, and dynamic impacts.

In a study using a big sample of the developing nations, Dinh et al. (2019) analyse the outcomes of FDI on the development of the economy. Using panel ARDL, they discover that FDI adds to growth in the long-run with varying levels of effects across income groups. Noteworthy, the research evidence that it is the low income countries that experience a less powerful growth effect of FDI is an indication that structural constraints can restrict the capacity to capitalize on inflows of foreign capital in low income countries.

Turning to Africa, Asongu & Odhiambo (2019) investigate the question of the interaction of the factors of openness with governance and the quality of institutions. Their results suggest that TO is not a consistent growth-promoting factor that needs to be complemented by gains in institutional capacity. The paper has emphasized how poor governance institutions may moderate the potential growth benefits of openness as finding that is especially applicable to the low income countries where institutional development is still skewed.

Jalil & Rauf (2021) also provide more recent work where the TO-growth nexus is revisited on an updated panel data and novel estimation methods. They find that TO has a positive association to economic growth in developing countries, however the association is model specific and country specific. The authors focus on the fact that the openness-growth relationship is not universal and can vary significantly even within income groups, which underlines the necessity of analysis disaggregation.

Wang et al. (2022) use a bibliometric and dynamic method to give a very comprehensive overview of the existing empirical literature on the issue of FDI and economic growth as it develops. Their research reports a change in the recent research with the unconditional effects of growth giving way to research with an emphasis on absorptive capacity, sectoral composition and institutional quality. The review notes that in research that concentrates on the low income countries, growing evidence is presented in the literature that identifies mixed or conditional impacts of FDI, which is the complexity of investment led growth in structurally constrained economies.

The contribution of TO to growth outcomes is also discussed by Nam (2022), who estimates the developing Asian economies by panel data techniques. The research concludes that although higher growth is observed to be linked with TO, the relationship differs in different countries under different export structure and macroeconomic stability. Even though the findings do not specifically apply to low income countries, the results show the importance of structural features in mediating the influence of openness based on the growth effects.

Osuma & Nzimande (2024) provide recent regional evidence using Sub-Saharan Africa as its example to study the dynamic nature of TO and economic growth. They demonstrate, based on panel techniques, that the openness to trade is associated with growth, although these associations depend on the external financing conditions and debt dynamics. Their findings indicate that it is not possible to analyse the outcomes of openness related growth without considering the macroeconomic constraints which is especially applicable to low income countries.

The combined effect of TO and FDI has also been given attention in recent research works. In a re-evaluation of the openness-growth nexus on specific developing Asian economies, Shan and Mittal (2024) explore selected panel estimators that consider the cross-sectional dependence. Their results show that both TO and FDI are linked to long-run growth though the effects are varied across countries and time. The paper supports the thesis that external integration has a variety of, and interacting, channels of effect on growth.

On the worldwide front, UNCTAD World Investment Report (2023) records the recent developments of FDI flows to the developing and low income nations. The report points out that although there has been an increase in the FDI inflows in some of the low income economies, they are very volatile and concentrated in few sectors. The report does not give a clear causal argument but highlights the disequilibrium nature of FDI and how this affects the development outcomes.

A more narrowly scoped empirical study by Ketteni et al. (2020) looks at the impact of openness-related policies on productivity and growth in developing nations. Their results indicate that TO can be linked to the growth in productivity, although the impacts are sector and income specific. The research contributes to the recent findings that the consequences of aggregate growth could conceal significant underlying heterogeneity.

Lastly, Nguyen & Vu (2023) compare the relationship between growth, FDI, and TO in low and lower middle income countries. Their findings reflect the view that growth effects of FDI are better when followed by increased rates of TO, which implies that both channels are complementary. The authors warn, however, that such effects are not homogenous and are subject to the domestic economic conditions.

Put all together, the new literature gives a better picture of the connection between TO, FDI and economic growth. Instead of contributing to a universal growth-enhancing contribution of openness and FDI, more recent studies have highlighted conditionality, heterogeneity and the significance of domestic structural factors. These improvements notwithstanding, the research evidence on this subject, on low income countries alone, is scanty and is subject to bias in terms of research methods and sample. This is the gap that drives the current research that aims at offering new empirical data on growth impacts of TO and FDI in low income countries.

Though there is much literature on the association between FDI, TO, and economic growth, little empirical evidence has been generated on the relationship between these factors and low income countries. A great number of current studies are based on mixed samples of developing and developed economies, which can conceal unique structural features and the growth behaviour of low income countries. Besides, a significant proportion of panel studies in the field presuppose cross-sectional independence between the nations, even though there are global shocks and spill overs. The effects of overlooking cross-sectional dependence are biased and inconsistent estimates of long-run relationships. As a result, one cannot find strong evidence offering to deal with both the specifics of the low-income countries and the methodological problems of cross-sectional dependence.

III. Data and Methodology

Country and Variable Selection

The first group of countries that this study considers is a group of low income countries, as categorized by World Bank and as those countries that have a gross national income per capita of US 1145 and below. According to such classification, the first sample included 26 countries, the research time frame is 1990-2020 and this period enables the researcher to identify long term growth, TO and FDI trends.

The systematic screening process was used due to the limitations of the data, to provide consistency and reliability of the panel dataset. The countries whose observations were not made on the key variables over five consecutive years were locked out because long-gap data may affect the strength of panel estimations. It was based on this exclusion criterion that the final sample was narrowed down to eight low income countries with a good data coverage during the period under study. In the remaining nations, the missing observations (of up to five years) were solved by means of linear interpolation.

The explained variable in the analysis is the growth rate of GDP per capita because this is a measure of economic growth. TO is used as the ratio between the imports and of goods and services in constant 2015 USD and the gross domestic product in constant 2015 USD. The FDI is an amount of net inflows that are expressed in percentage of GDP.

In order to control the other growth relevant variables, the model incorporates gross capital formation as a % in GDP to account domestic investment, secondary school enrolment as a proxy in human capital, the age dependency ratio to capture demographic pressures, broad money or as a % of GDP to reflect financial development, and net barter terms of trade index (2015 = 100) to control external price movements of trade. The variables are all drawn out of the World Development Indicators of the World Bank.

IV. Methodology

The empirical study will take the systematic panel econometric process to determine the relationship between explained and explanatory variables in low income countries. The methodology will be applicable to such important econometric challenges as multicollinearity, slope heterogeneity, cross-sectional dependence, and stationarity and thus estimate the relationship due to the multi-country character of the dataset and long-time dimension.

It is a preliminary step and as such the multicollinearity of the explanatory variables is considered using a correlation table. This will be done to evaluate the level of relationship between TO, FDI and combination of the control variables. It is also noteworthy not to have overly high correlations so as to obtain unstable coefficients estimation and the inflated standard errors of the following regressions.

This is followed by the test of cross-sectional dependence (CD). CD will occur in the panels with low income countries because the global shocks, which include; fluctuation of commodity prices, international financial states and geopolitical events, are common. Such dependence should not be ignored, and such can cause biased inference. In order to objectively analyse this problem, the Pesaran (2004) cross sectional dependence test is used. CD suggests the application of second-generation panel data techniques that clearly address inter-country correlations.

The analysis is then carried to test the slope heterogeneity (SH) among countries. The homogenous slope coefficients could be limiting, especially to low income countries in that they vary in the quality of their institutions, economic structure, and policy settings. The SH test of Pesaran and Yamagata (2008) will test the hypothesis that slope coefficients are cross-sectional. The outcome of this test guides the selection of the estimators which can accommodate the presence of heterogeneity.

Once the CD and SH have been established, the panel unit root test (second generation) are used to investigate the time-series characteristics of the variables. Particularly, one of the Pesaran (2007) suggestions is the Cross-sectionally Augmented IPS (CIPS) unit root test. The CIPS test, unlike first-generation tests, takes into consideration CD in which individual regressions are enhanced by cross-sectional averages. This test is appropriate when the panels are characterized by common factors acting on various countries at the same time. The outcome of the CIPS determines the stationarity of the variables in levels or the stationarity of the variables after initially differencing.

After determining the stationarity of variables, the presence of co-integration is tested by Westerlund (2007). The test is especially suitable with CD and heterogeneity as the test relies on error-correction dynamics as opposed to contingent to the residual test. The presence of co-integration shows that economic growth, TO, FDI and the control variables move in the same direction over the long run.

After co-integration is proved, impact is estimated with the help of Cross-sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) model, which was coined by Chudik and Pesaran (2015). In this estimator, it is possible to have a heterogeneity across countries which is suitable in a reasonably homogeneous set of low income countries.

V. Results

This section presents the empirical findings in low income countries. The results are reported in a sequential manner that follows the econometric strategy outlined in the methodology, ensuring transparency and logical consistency.

Table 1: *Descriptive Statistics*

Variable	Obs	SD	Mean	Max	Min
GDP	248	6.761	1.431	61.874	-41.541
TO	248	.357	3.829	4.839	2.98
FDI	248	2.512	4.371	46.27	-4.02
Secondary School Enrollment	248	.701	2.852	4.175	1.552
Broad Money	248	.442	2.932	4.078	1.638
Gross Capital Formation	248	.471	2.969	4.097	1.023
Barter Terms of Trade	248	.336	4.494	5.31	3.001

Source: Authors' own calculations

Table 1 reports the descriptive statistics. The panel consists of 248 observations, reflecting the balanced structure of the dataset. Economic growth, shows substantial variation, with both negative and high positive values, indicating pronounced growth volatility across low income countries over the sample period. TO and FDI also display considerable dispersion, suggesting heterogeneity in external integration and capital inflows among countries. The control variables, including secondary school enrolment, broad money, gross capital formation, and barter terms of trade, exhibit relatively moderate variation, reflecting differences in human capital accumulation, financial depth, domestic investment, and external trade conditions across the sample.

Table 2: *VIF Statistics*

Variable	VIF	1/VIF
TO	2.445	.409
GCF	2.04	.49
Secondary School Enrolment	1.824	.548
FDI	1.785	.56
Age Dependency	1.562	.64
Broad Money	1.55	.645
Barter Terms	1.225	.816

Source: Authors' own calculations

Table 2 presents the variance inflation factor (VIF) statistics used to check multicollinearity among the explanatory variables. All VIF values are below accepted threshold levels, showing that multicollinearity is not an issue in the model. The highest VIF is observed for trade openness (2.445), while the remaining variables exhibit even lower values. The corresponding inverse VIF values further support this conclusion. The results suggest that the regressors can be jointly included without compromising the reliability of the estimates.

Table 3: *CD Test*

Test Statistic	P-value
49.477	0.0074

Source: Authors' own calculations

The presence of CD is examined in Table 3 using the CD test. The reported test statistic of 49.477 is significant at the 1% level, indicating strong CD across countries. This result show that low income countries in the sample are affected by common shocks or unobserved factors, such as global economic conditions or commodity price movements. The rejection of cross-sectional independence provides empirical justification for the use of second-generation panel data methods.

Table 4: *SH Test*

Delta	P-value
2.134	0.000
3.268 (Adj.)	0.000

Source: Authors' own calculations

Table 4 reports the results of the SH test. Both the standard delta and the adjusted delta statistic are significant suggesting that SH is present in data. This finding indicates that the relationship between variables vary across countries, reinforcing the usage of estimators that will allow for heterogeneity.

Table 5: *CIPS Unit Root Test*

Variable	CIPS Statistic	1% CV	5% CV	10% CV	Level of Diff.
GDP	-5.314	-2.550	-2.330	-2.210	I(0)
TO	-5.379	-2.550	-2.330	-2.210	I(1)
FDI	-3.292	-2.550	-2.330	-2.210	I(0)
Secondary School Enrollment	-3.771	-2.550	-2.330	-2.210	I(1)
Broad Money	-2.649	-2.550	-2.330	-2.210	I(0)
GCF	-2.786	-2.550	-2.330	-2.210	I(0)
Barter Terms	-2.605	-2.550	-2.330	-2.210	I(0)

Source: Authors' own calculations

The results of the CIPS test are presented in Table 5. The findings indicate a mixed order of integration in the variables. Economic growth, FDI, broad money, gross capital formation, and barter terms of trade are stationary in levels, while TO and secondary school enrolment become stationary after first differencing. The presence of both I(0) and I(1) variables supports the suitability of an ARDL-type framework for estimation.

Table 6: *Co-integration Test*

Test	Statistic	P-value
Westerlund (Variance)	-2.293	0.010

Source: Authors' own calculations

Table 6 reports the results of the Co-integration test. The statistically significant test statistic confirms the existence of a long-run relationship amongst the variables. This result provides the basis for estimating long run relationship using a co-integration consistent estimator.

Table 7: *CS-ARDL Estimates*

Variable	Short Run	Long Run
TO	-19.744*** (6.322)	-20.596*** (8.410)
FDI	0.765** (0.285)	1.845*** (0.670)
Secondary School Enrollment	3.259 (21.464)	4.336 (10.945)
Broad Money	-10.622 (7.836)	-5.783 (5.082)
GCF	10.403** (4.638)	6.521** (3.131)
Barter Terms	0.688 (5.713)	0.193 (3.627)
L.FDI	1.065* (0.444)	
L2.FDI	0.662*(0.245)	

Source: Authors' own calculations

Table 7 presents the CS-ARDL results, reporting both short-run and long-run coefficients. In the short run, TO exhibits a significant negative association with economic growth, while FDI shows a significant positive effect. GCF is also found to have a significant positive impact on growth in the short run. The lagged values of FDI are significantly positive, indicating persistence in the growth effects of investment inflows. Other control variables, including secondary school enrolment, broad money, and barter terms of trade, are not significant in the short run.

In the long run, TO continues to display a significantly negative relationship with economic growth. In contrast, FDI remains significantly positively associated with growth, suggesting a sustained long-run contribution. GCF also exerts a significantly positive long-run effect. The coefficients of secondary school enrolment, broad money, and barter terms of trade are not significant in the long run, indicating that their effects on growth are less robust once common factors and long-run dynamics are accounted for.

The results show the importance of accounting for CD and heterogeneity when analysing growth determinants in low income countries. The CS-ARDL estimates suggest that TO and FDI exert distinct impact on economic growth across short-run and long-run horizons, while domestic investment consistently supports

growth. These findings are robust to the presence of common shocks and heterogeneous slope coefficients across countries.

VI. Conclusion

Drawing on panel evidence from low income countries over the period 1990–2020, this paper evaluates how TO and FDI relate to economic growth when cross-country interdependence and parameter heterogeneity are explicitly addressed. By employing second-generation panel estimators, the analysis moves beyond conventional approaches and isolates both short-term adjustments and long-term growth relationships in the presence of common global shocks.

The empirical findings point to distinct roles for TO and FDI in shaping growth outcomes. While greater TO is associated with weaker growth performance over time, foreign direct investment exhibits a consistently positive relationship with economic growth across different time horizons. Domestic investment, measured through gross capital formation, also emerges as an important driver of growth, underscoring the continued relevance of internal capital accumulation alongside external engagement.

These findings underscore the importance of country-specific structural conditions in shaping growth outcomes in low income countries. While integration into the global economy has intensified over time, its growth effects depend on the nature of that integration and the capacity of domestic economies to absorb external influences. The results also demonstrate the relevance of employing econometric approaches that account for CD, as failure to do so may lead to misleading inferences.

From a policy perspective, the results suggest that strategies aimed at promoting economic growth in low income countries should go beyond trade liberalisation alone and place greater emphasis on strengthening domestic productive capacity and attracting growth-enhancing FDI. Policies that improve the investment climate, support domestic capital formation, and enhance absorptive capacity may help translate external engagement into more sustainable growth outcomes.

Despite its contributions, the study has certain limitations. The analysis is constrained by data availability, which limits the sample size and country coverage. In addition, the study does not differentiate between sectoral compositions of trade and FDI, which may yield more nuanced insights.

This study contributes to the literature by providing robust evidence on the growth effects of TO and FDI in low income countries using advanced panel techniques. The findings highlight the need for context-specific and methodologically sound analyses when assessing the role of global integration in shaping development outcomes.

References

[1]. Albahouth, A. A., & Tahir, M. (2024). The Relationship between Trade Openness and FDI Inflows: Evidence-Based Insights from ASEAN Region. *Economies*, *12*(8), 208. https://doi.org/10.3390/economies12080208

[2]. Asongu, S. A., & Odhiambo, N. M. (2019). Insurance policy thresholds for economic growth in Africa (MPRA Paper No. 101135). Munich Personal RePEc Archive. https://mpra.ub.uni-muenchen.de/101135/

[3]. Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics, 188*(2), 393–420. https://doi.org/10.1016/j.jeconom.2015.03.007

[4]. Dinh, T. T.-H., Vo, D. H., & Nguyen, T. C. (2019). Foreign direct investment and economic growth in the short run and long run: Empirical evidence from developing countries. *Journal of Risk and Financial Management, 12*(4), 176. https://doi.org/10.3390/jrfm12040176

[5]. Jalil, A., & Rauf, A. (2021). Revisiting the link between trade openness and economic growth using panel methods. *The Journal of International Trade & Economic Development, 30*(8), 1168–1187. https://doi.org/10.1080/09638199.2021.1938638

[6]. Nam, H., & Ryu, D. (2024). Does trade openness promote economic growth in developing countries? *Journal of International Financial Markets Institutions and Money*, *93*, 101985. https://doi.org/10.1016/j.intfin.2024.101985

[7]. Nguyen, V. M. H., Ho, T. H., Nguyen, L. H., & Pham, A. T. H. (2023). The Impact of Trade Openness on Economic Stability in Asian Countries. *Sustainability*, *15*(15), 11736. https://doi.org/10.3390/su151511736

[8]. Osuma, G., & Nzimande, N. P. (2024). Exploring the dynamic link between trade openness, external debt, and economic growth in Sub-Saharan Africa. *Economies, 12*(11), 283. https://doi.org/10.3390/economies12110283

[9]. Pesaran, M. H. (2004). General diagnostic tests for cross-section dependence in panels. *CESifo Working Paper Series No. 1229*. Munich: CESifo Group.

[10]. Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265–312. https://doi.org/10.1002/jae.951

[11]. Pesaran, M. H., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics, 142*(1), 50–93. https://doi.org/10.1016/j.jeconom.2007.05.010

[12]. Shan, T. A., Mittal, N. A., & Rather, S. A. (2024). Revisiting openness-growth nexus: Panel data estimates for selected developing Asian countries. *Transnational Corporation Review*, *16*(2), 200051. https://doi.org/10.1016/j.tncr.2024.200051

[13]. United Nations Conference on Trade and Development (UNCTAD). (2023). *World Investment Report 2023: Global investment trends and implications for developing countries*. UNCTAD. https://unctad.org/publication/world-investment-report-2023

[14]. Wang, X., Xu, Z., Qin, Y., & Skare, M. (2021). Foreign direct investment and economic growth: a dynamic study of measurement approaches and results. *Economic Research-Ekonomska Istraživanja*, *35*(1), 1011–1034. https://doi.org/10.1080/1331677x.2021.1952090

[15]. Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics, 69*(6), 709–748. https://doi.org/10.1111/j.1468-0084.2007.00477.x