

The Role of Export Performance and Capital Accumulation in Driving Industrial Success in Pakistan: An Empirical Assessment

Muhammad Ibrahim Nasir

Lahore Grammar School (LGS),

Johar Town Branch, Lahore.

Email: ibrahimnasir916@gmail.com

Arifa Saeed (Corresponding Author)

Assistant Professor; Department of Economics and Finance,

Greenwich University, Karachi.

Email: arfasaeed@gmail.com

Abstract

This study investigates the imperative role of export performance in driving industrial success in Pakistan. The expansion in industrial production is an essential indicator for representing economic strength while contraction in industrial production demonstrates economic weakness of a country. After considering ARDL bounds test over a period of 1981 to 2023, long run cointegrating relation between industrial production and export performance is confirmed. The empirical results suggest that expansion in exports value index significantly accelerates industrial production in long and short term in Pakistan. This confirms the evidence of export-led-industrial success hypothesis in Pakistan. The findings further reveal that capital accumulation also expands industrial production in both periods while money supply leaves its positive impact on industrial production only in long run. This research suggests that government may take certain steps in expanding exports; size of capital and quantity of money in a way that their expansionary effects are larger than their opportunity cost.

Keywords: Industrial Production; Export Value Index, Capital Accumulation, Money Supply, ARDL Bounds Test, Pakistan

Introduction Section:

The economic progress of any economy is represented through the expansion of an industrial sector. This sector not only gives stimulus to agriculture sector on the one side by purchasing raw material from it and on the other side it raises employment opportunities and income levels of the households who are associated with it. By creating both backward and forward linkages, this sector is considered as the backbone of a country. There are many macroeconomic factors which participate in determining its performance in any economy. There are several studies which explored the determining factors of economic progress for various economies and these studies are like Chen et al. (2023); Hanif et al. (2020); Huang et al. (2020); Alharthi and Hanif (2020); Nazli et al. (2018); Hanif and Gago-de Santos (2017) and Hanif et al. (2014). The present research has taken exports, capital accumulation, money supply, energy consumption and labor force participation rate in determining the pattern of industrial performance in Pakistan.

The advocates of exports expansion suggest that more foreign exchange earnings are retrieved when any country is sending more exportable to abroad. The high earnings of foreign exchange through exports will expand the cash in hands of investors who in return increase level of domestic production by elevating investments. The increased demand for inputs will expand employment opportunities, rewards or purchasing powers of the households, and therefore, overall demand for goods and services will tend to increase on the one side. While on the other side, supply of goods and services is based on increased demand for goods and services and it is also dependent upon the size of investments. These both factors support in expanding domestic

production. This in turn represent expansion of an industrial production. This study develops a notion that exports are important driver which determines industrial success.

Formation of capital refers to increase in physical capital like investments, machinery, technology etc which helps in determining industrial production in an economy. Therefore, it is also treated as important driver of industrial production. Due to increase in capital stock over time, investments increase, as a result, demand for inputs increase and through this domestic production increases. This shows expansion of industrial sector. The literature on production function approach treats capital stock as an important factor which determines a country's level of production. Therefore, we have taken this indicator as a part of our proposed function. In order to capture the effects of monetary expansion in our study, we have taken quantity of money as an explanatory indicator in determining industrial success. The increase in money supply refers to expansionary role of monetary policy and decrease in quantity of money will reveal contraction of monetary policy. We assert that due to expansionary monetary policy, industrial production should expand. This research has also taken into account the role of labor force participation rate and energy utilization as explanatory variables which facilitate in finding the pattern of industrial production in Pakistan.

The rest of the study is organized by explaining literature review in the next section. The data source and methodology in the third section. Results and their discussion will be presented in section 4 and conclusion and policy implication in the last part of the study.

Literature Section:

Shahbaz et al. (2011) investigated the impact of exports and capital formation on economic growth of Pakistan. Their findings suggested that both exports and capital formation enhanced economic growth in Pakistan. The role of exports was examined by Haseeb et al. (2014) for targeting Malaysian output function. Their study highlighted that exports had significant and positive effects on economic growth of Malaysian economy. The export led growth hypothesis was tested by Al-Assaf and Al-Abdulrazag (2015) for a case of Jordan. They reported that exports with its lagged terms had significant and positive impact on economic growth. As far as its exports in time "t" is concerned, it left insignificant impact in both time spans. The contribution of Nguyen (2016) guided us that exports had increasing and significant effect on economic growth in Vietnam. After this we witnessed the findings of Fatemah and Qayyum (2018) who disclosed significantly appreciating role of capital formation and exports performance for Pakistan's economic growth for both long and short run periods.

The role of high technology exports was captured for targeting economic growth of Turkish economy by Canbay (2020). The study highlighted that exports had significant and increasing effects on economic growth only in long run while in short run, its effect appeared in significant. After this research, we found the study of Kim et al. (2022) in which they considered the case of Myanmar and found that real exports had significant and increasing effects on economic growth in both selected time spans. In another research, we witnessed Wang et al. (2022) who suggested that renewable energy left U-shaped while non renewable energy left inverted U-shaped impact on economic growth. Besides this study, Odhiambo (2022) reported that export led growth hypothesis did not stand valid for low- and middle-income countries. Consumption of electric power left accelerating and significant effects upon economic growth of Portugal and Finland countries as highlighted by Hassan et al. (2022) in their research. In a research organized by Chiwira et al. (2023), exports were found in boosting economic growth only in long run in case

of custom union of South Africa. After them, we visited the Hao's (2023) contribution in which they tested the response of industrial output to the changes in exports of Chinese economy. The study confirmed the evidence of export led industrial production for short term only in the selected country. Ahmad et al. (2024) inquired the role of exports and capital accumulation in determining economic growth of Singaporean economy. Their results suggested that both exports and capital accumulation had significant and elevating role in boosting economic growth in the selected economy. In another research, Jabbar et al. (2024) tested the trade led growth hypothesis for Luxembourg economy. After applying ARDL method, their results were validating the highlighted hypothesis. Their results further exposed that capital formation was significantly increasing economic growth in the selected country case. Chiwira et al. (2024) conducted research for Botswana in which they highlighted significantly positive impact of capital and exports on economic growth. The significantly elevating effects of capital accumulation and export performance were investigated by Chenhui et al. (2024) upon economic growth of developed economies of the world. Afterwards, we witnessed the study executed by Riaz et al. (2024) in which they confirmed the presence of trade led growth hypothesis for Portugal economy. Additionally, they also confirmed that economic growth was increasing due to increase in capital formation. After this research, in a new research, Riaz et al. (2024) disclosed significantly positive impact of money supply in boosting industrial production of Singapore economy. The methodology section is discussed in the coming section 3.

Methodology Section:

The role of exports performance and capital accumulation in addition to certain controlling factors to target industrial success is going to be tested in this research. We have considered industrial value added as share of GDP, labor force participation rate, capital formation, exports value index, broad money supply and energy consumption to frame our research function for obtaining empirical results. We have consulted World Bank's (2024) data bank to obtain annual data series ranging from 1981-2023. We have framed the below suggested function:

$$\ln \text{INDP}_t = f (\ln \text{LFPR}_t, \ln \text{CA}_t, \ln \text{EVI}_t, \ln \text{BMS}_t, \ln \text{EC}_t)$$

Whereas;

Table 1: Names of the Variables & their Demonstration

Indicators	Representation
Value of Industrial Production as percentage of GDP used as proxy for Industrial Success	$\ln \text{INDP}_t$
Labor Force Participation Rate used as proxy for Labor Force	$\ln \text{LFPR}_t$
Gross Fixed Capital Formation as percentage of GDP used as proxy for Capital Accumulation	$\ln \text{CA}_t$
Export Value Index used as proxy for Exports Performance	$\ln \text{EVI}_t$
Broad Money as percentage of GDP used as proxy for Money Supply	$\ln \text{BMS}_t$
Energy Use as percentage of Total Energy used as proxy for Energy Consumption	$\ln \text{EC}_t$

For fetching empirical findings, we are going to use different steps. Initially, in order to see the overview of our suggested function, we will consider descriptive stats. The overview will guide us about the normality of the selected variables, averages and deviation of the variables from their corresponding mean values. We will examine the significant correlation between independent variables by applying variance inflation factor test (VIF) to see whether multicollinearity is relevant for our study or not. A correlation between two independent variables is said to be significant if the VIF value remains below 10 and vice versa otherwise. In case if the correlation between two independent variables is significant then it indicates absence of multicollinearity issue. Later on, we will find out the status of unit root by conducting KPSS (1992) test for unit root. This test will allow us to present the status of order of integration. The order of integration highlights the number of variables turns stationary at first difference and at level. Afterwards, we will consider bounds test suggested by Pesaran et al. (2001) to determine cointegrating relation in the long-term between industrial success; exports and capital accumulation along with some controlling factors like labor force participation rate, broad money supply and energy consumption. Variety of diagnostics will be applied to validate whether the empirical results obtained through these suggested tests are reliable or not. These diagnostics will be functional form test, serial correlation test, heteroskedasticity test, normality test and a CUSUM and CUSUM square diagram. This diagram will guide us about the stability of mean and variance of error term of our proposed function for this study. If the graphs will remain stable then the estimated coefficients for our proposed function will also remain stable during the suggested time span. After this, empirical results are provided in the below section:

Results and Discussion:

The discussion about the results for the suggested function is presented in this part of the study. Table 2 presents mean values, deviation from mean and normality of the obtained indicators. The findings indicate that energy consumption has highest mean value “5.9945%” while lowest mean value “-1.4231%” is witnessed for money supply. The results further indicate that industrial production, export value index and capital accumulation meet the conjectures of normal distribution as Jarque-Bera (JB) test is appeared as insignificant for these three indicators. The rest indicators do not meet assumptions normal distribution hence we conclude that labor force participation, money supply and energy consumption are not normally distributed. Table 2 presents the complete picture which is shared as below:

Table 2: Summary Stats

Tests/Variables	$\ln\text{INDP}_t$	$\ln\text{LFPR}_t$	$\ln\text{CA}_t$	$\ln\text{EVI}_t$	$\ln\text{BMS}_t$	$\ln\text{EC}_t$
Averages	2.8104	0.3912	2.7636	0.3865	-1.4231	5.9945
Deviation from Mean	0.0939	0.0075	0.1519	0.0766	0.2772	0.1047
Normality Test	2.9453	1373.9480	3.1522	3.4420	4.9463	7.5709
Probability Value	0.2293	0.0000	0.2068	0.1789	0.0843	0.0227
Number of Observations	43	43	43	43	43	43

Now the Variance Inflation Factor (VIF) test is utilized to detect multicollinear regressors in our proposed function. Table 3 provides the magnitudes of VIF between the explanatory factors and

we can see that there is no pair of explanatory indicators for which VIF magnitude is 10 or above. In fact for all pairs of independent variables, VIF value is below 10. Therefore, we conclude that all pairs of independent indicators are insignificantly correlated. This confirms that multicollinearity is not an issue in the present research. Besides our debate upon multicollinearity problem, this research uses KPSS (1992) test for stationarity in order to explore the unit root issue. In case if the LM stats falls in the critical region then we will reject null hypothesis of stationary data series and conclude that the indicator has a unit root issue. From the Table 4, we may see that LM-stats at level of zero difference case for labor force participation rate is 0.5757 which is less than the 0.739 - 1% critical value. This enables us to accept null hypothesis of absence of unit root issue for labor force. For the rest indicators we may see that the LM-stats remain above than the 0.739 - 1% critical value at zero difference case therefore, all the indicators other than labor force have unit root issue. At first difference case, all the indicators have LM-stats less than the 0.739 – 1% critical value hence, all the indicators have no unit root issue at this specification. Based on these results, we may suggest that one variable like labor force is stationary at level while the rest are stationary at first difference case. This confirms mixed order of integration for this research. The VIF stats and Table 4 are shared as below:

Table 3: VIF Matrix

Variables	$\ln\text{LFPR}_t$	$\ln\text{CA}_t$	$\ln\text{EVI}_t$	$\ln\text{BMS}_t$	$\ln\text{EC}_t$
$\ln\text{LFPR}_t$	-	1.1439	1.1054	1.1443	1.0526
$\ln\text{CA}_t$		-	3.6381	2.4641	2.1042
$\ln\text{EVI}_t$			-	6.8799	8.1021
$\ln\text{BMS}_t$				-	3.2817
$\ln\text{EC}_t$					-

Table 4: KPSS Unit Root Test

At Level		At First Difference	
Variables	KPSS-Test	Variables	KPSS-Test
$\ln\text{INDP}_t$	2.0185	$\Delta\ln\text{INDP}_t$	0.1764
$\ln\text{LFPR}_t$	0.5757	$\Delta\ln\text{LFPR}_t$	0.0328
$\ln\text{CA}_t$	1.8087	$\Delta\ln\text{CA}_t$	0.0484
$\ln\text{EVI}_t$	2.1127	$\Delta\ln\text{EVI}_t$	0.2266
$\ln\text{BMS}_t$	2.0811	$\Delta\ln\text{BMS}_t$	0.0762
$\ln\text{EC}_t$	0.4796	$\Delta\ln\text{EC}_t$	0.4367

Based on the guidance provided by the literature for mixed order of integrated data series, we utilize bounds test developed by Pesaran et al. (2001) to test whether exports value index, money supply, capital accumulation, labor force participation rate and energy consumption have long run cointegrating relation with industrial production or not. The below provided Table 5 demonstrates that exports value index, money supply, capital accumulation, labor force participation rate and energy consumption have a significant long run cointegrating relation with industrial value added because the F-test value (5.0094) appears greater than the upper critical value at 5% significance level (4.2868). Following this, we have obtained diagnostic tests like functional form, serial correlation, heteroskedasticity and normality tests to validate our findings. The insignificant probability values suggest that the null hypotheses of all these suggested diagnostics are correct. Therefore, the functional form is correctly specified, errors are not serially correlated, variance of error term is homoskedastic and error term is normally distributed. This nutshell is drawn because all these diagnostic tests appear to be insignificant. Below given Table 5 reveals the results of bounds test:

Table 5: Pesaran et al. (2001) Estimates

Proposed -Function	$\ln \text{INDP}_t = f (\ln \text{LFPR}_t, \ln \text{CA}_t, \ln \text{EVI}_t, \ln \text{BMS}_t, \ln \text{EC}_t)$	
Lag-Order	(1, 0, 0, 0, 1, 0)	
F –Test	5.0094	
Significance-Level	Critical Bounds	
	Lower	Upper
	5 –percent	2.9346
10 –percent	2.4839	3.6694
DIAGNOSTIC -TESTS		
Serial –Correlation	1.2764 [0.259]	
Functional –Form	1.8868 [0.170]	
Normality	0.2311 [0.891]	
Heteroscedasticity	0.7682 [0.381]	

“[]” demonstrates prob. values.

Moving on, we have captured the impact of export value index, capital accumulation, money supply, energy consumption and labor force participation rate on industrial value added in long run time span and results are disclosed in the Table 6. The results indicate that expansion in exports tends to increase foreign exchange earnings. Through this, investors possesses more cash in hands tend invest more and hence industrial production will grow in the country. Due to one percent increase in exports, industrial production significantly escalates by 0.8199 percent. Besides this, we witness the contribution of capital accumulation; it is also facilitating the industrial expansion in Pakistan. As capital formulates or accumulates, it enables investors to increase the size of investments in the goods market and through this overall production increases. Hence industrial sector follows upward trajectory. The industrial production significantly enhances by 0.1074% due to one percent increase in capital accumulation. The findings further reveal that monetary expansion is also playing its imperative role in accelerating

industrial success in long run. As money supply grows by one percent, industrial value added significantly elevates by 0.1040 percent. Table 6 further discloses that both energy consumption and labor force participation rate are insignificantly determining industrial production. Among all the indicators, we witness that exports are leaving strong impact in boosting industrial success. This study validates that export leads industrial success in Pakistan. The long run coefficients are presented as below:

Table 6: Parameters for Long Run

Dependent Variable = $\ln\text{INDP}_t$				
Regressors	Coefficients	Standard Error	t-test	P.Value
$\ln\text{LFPR}_t$	-0.2742	0.5222	-0.5250	0.6030
$\ln\text{CA}_t$	0.1074	0.0493	2.1773	0.0365
$\ln\text{EVI}_t$	0.8199	0.2669	3.0721	0.0042
$\ln\text{BMS}_t$	0.1040	0.0372	2.7930	0.0085
$\ln\text{EC}_t$	0.1378	0.1157	1.1903	0.2422
C	1.6310	0.6411	2.5440	0.0157

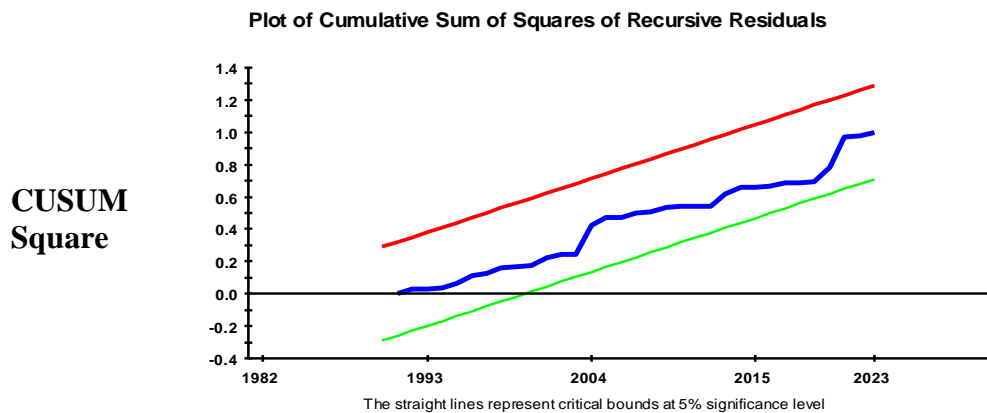
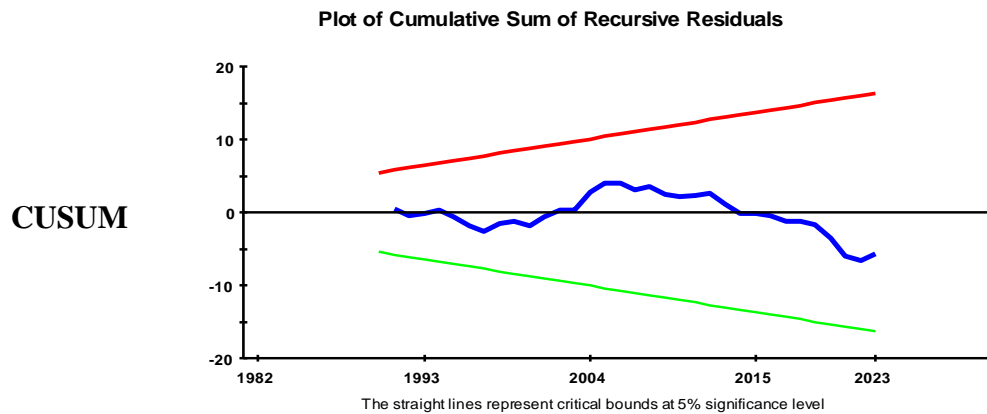
After Table 6, we present the discussion of short-run coefficients. Table 7 reports that exports and capital accumulation are significantly improving industrial production in short run. The impact of labor force participation rate, money supply and energy consumption remain insignificant. This shows that all these indicators do not contribute in industrial success in short-term time span. After increasing exports by 1%, we witness a significant improvement in industrial production by 0.7006% while industrial production significantly stimulates by 0.0918% if capital is expanded by 1% in Pakistan in short run. The results also conclude that exports are playing important role in strengthening industrial success in Pakistan. After this, negative and significant sign of $\text{ecm}(t-1)$ suggests that convergence hypothesis is valid in our research and speed of adjustment is quite high because every year the error will be corrected by almost 85.45% and we will be able to attain a stable long-term equilibrium in about 1.17 years. After this, the significant probability value of F-test suggest that the overall model is good fit and variation in industrial production due to variation in export value index, capital accumulation, money supply, labor force and energy consumption is explained by almost 0.5201 percent and remaining variation in industrial production is due to error term. The results are provided in the below Table 7:

Table 7: Short-Run Estimates

Dependent Variable = $\Delta\ln\text{INDP}_t$				
Regressors	Coefficients	Standard Error	t-test	P.Value
$\Delta\ln\text{LFPR}_t$	-0.2343	0.4553	-0.5145	0.6102
$\Delta\ln\text{CA}_t$	0.0918	0.0424	2.1626	0.0377

$\Delta \ln EVI_t$	0.7006	0.2673	2.6206	0.0130
$\Delta \ln BMS_t$	-0.0788	0.0486	-1.6199	0.1145
$\Delta \ln EC_t$	0.1177	0.0983	1.1980	0.2392
CointEq(-1)	-0.8545	0.1385	-6.1707	0.0000
Diagnostic Tests				
\bar{R}^2			0.5201	
F-Test (Probability Value)			8.5727 (0.000)	
DW-Test			1.6957	

The stability of the estimated coefficients for the selected time span can now be inquired by using CUSUM and CUSUM square graphs. These two graphs indicate that mean and variance of errors are stable if they report their calculated value within their critical values. In case if their values go beyond their corresponding critical values then one or both turn to be unstable. In this research, both graphs are stable because the calculated mean and variance of error term are found within their critical values. Therefore, the estimated coefficients for long and short terms during 1981-2023 remain stable. The graphs are shared as below:



Conclusion:

This research is conducted to inquire the impact exports value index in determining industrial success in Pakistan. Capital accumulation, money supply, energy consumption and labor force participation rate are obtained as controlling factors. The estimates of KPSS (1992) test for stationarity suggest mixed order of integrated series. ARDL bounds test also provide evidence that export value index, capital formation, money supply, labor force and energy consumption have significant link with industrial production in long run. The results also suggest that exports and capital accumulation have statistically significant and escalating influence on industrial production in both long and short run while money supply is witnessed in boosting industrial value added only in long run. The results also conclude that exports have strong impact in expanding industrial production and therefore, this research provides evidence that exports lead to industrial success in Pakistan. This study recommends that government must initiate strategies which may expand exports volume, size of capital and quantity of money to retrieve expansion in industrial production. It is imperative to note that the expansion in these indicators may be made in a way that the cost to benefit ratio may keep on falling.

References:

1. Ahmad, I., Saeed, A., Saeed, M. I., & Ajekwe, C. C. (2024). Exports, FDI Inflows, Renewable Energy and Economic Growth: An Empirical Evidence from Singapore. *Bulletin of Business and Economics (BBE)*, 13(1), 850-856.
2. Al-Assaf, G., & Al-Abdulrazag, B. (2015). The validity of export-led growth hypothesis for Jordan: A bounds testing approach. *International Journal of Economics and Financial Issues*, 5(1), 199-211.
3. Alharthi, M., & Hanif, I. (2020). Impact of blue economy factors on economic growth in the SAARC countries. *Maritime Business Review*. 5(3), 253-269. <https://doi.org/10.1108/MABR-01-2020-0006>
4. Canbay, Ş. (2020). Investigation of the effect of Turkey's high-tech exports on the economic growth using the structural break ARDL bounds testing. *Elektronik Sosyal Bilimler Dergisi*, 19(74), 865-878.
5. Chen, S., Hassan, M. S., Latif, A., Rafay, A., Mahmood, H., & Xu, X. (2023). Investigating resource curse/blessing hypothesis: An empirical insights from Luxembourg, the Netherlands, and Portugal economies. *Resources Policy*, 83, 103647. <https://doi.org/10.1016/j.resourpol.2023.103647>
6. Chenhui, H., Hassan, M. S., Afshan, S., Hanif, I., Umair, M., & Albalawi, O. (2024). Renewable Energy, Regional Tourism, and Exports to Tackle Stagnant Growth in Developed Economies. *Heliyon*, 10(18), 1-16.
7. Chiwira, O., Muchingami, L., & Jambani, L. (2024). Cointegrating and causality relationship between exports and economic growth: case for Botswana. *International Journal of Research in Business and Social Science*, 13(5), 482-493.
8. Chiwira, O., Muchingami, L., & Jambani, L. (2023). Exports and economic growth: relationships and threshold analysis for the Southern Africa customs union. *International Journal of Research in Business and Social Science (2147-4478)*, 12(8), 274-288.
9. Fatemah, A., & Qayyum, A. (2018). Modeling the impact of exports on the economic growth of Pakistan. *Turkish economic review*, 5(1), 56-64.
10. Hanif, I., Chaudhry, I. S., & Wallace, S. (2014). Fiscal autonomy and economic growth nexus: Empirical evidence from Pakistan. *Pakistan Journal of Social Sciences*, 34(2), 767-780.

11. Hanif, I., & Gago-de Santos, P. (2017). Impact of fiscal decentralization on private savings in a developing country: Some empirical evidence for the case of Pakistan. *Journal of South Asian Development*, 12(3), 259-285. <https://doi.org/10.1177/0260107917735403>
12. Hanif, I., Wallace, S., & Gago-de-Santos, P. (2020). Economic growth by means of fiscal decentralization: an empirical study for federal developing countries. *SAGE Open*, 10(4), 2158244020968088. <https://doi.org/10.1177/2158244020968088>
13. Hassan, M. S., Mahmood, H., & Javaid, A. (2022). The impact of electric power consumption on economic growth: a case study of Portugal, France, and Finland. *Environmental Science and Pollution Research*, 29(30), 45204-45220.
14. Hao, Y. (2023). The dynamic relationship between trade openness, foreign direct investment, capital formation, and industrial economic growth in China: new evidence from ARDL bounds testing approach. *Humanities and Social Sciences Communications*, 10(1), 1-11.
15. Haseeb, M., Hariyatie Hartani, N., Abu Bakar, N. A., Azam, M., & Hassan, S. (2014). Exports, foreign direct investment and economic growth: Empirical evidence from Malaysia (1971-2013). *American Journal of Applied Sciences*, 11 (6), 1010-1015.
16. Huang, Y., Raza, S. M. F., Hanif, I., Alharthi, M., Abbas, Q., & Zain-ul-Abidin, S. (2020). The role of forest resources, mineral resources, and oil extraction in economic progress of developing Asian economies. *Resources Policy*, 69, 101878. <https://doi.org/10.1016/j.resourpol.2020.101878>
17. Jabbar, A., Ahmad, I., Sultan, A., & Iqbal, J. (2024). The Impact of Financial Development and Trade Openness on Economic Growth: Time Series Evidence from Luxembourg. *Bulletin of Business and Economics (BBE)*, 13(1), 730-735.
18. Kim, B., Kyophilavong, P., Nozaki, K., & Charoenrat, T. (2022). Does the export-led growth hypothesis hold for Myanmar?. *Global Business Review*, 23(1), 48-60.
19. Kwiatkowski, D., Phillips, P. C., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root?. *Journal of econometrics*, 54(1-3), 159-178.
20. Nazli, A., Siddiqui, R., & Hanif, I. (2018). Trade reforms and productivity growth in manufacturing industries of Pakistan. *Review of Economics and Development Studies*, 4(2), 199-207.
21. Nguyen, T. H. (2016). Impact of export on economic growth in Vietnam: Empirical research and recommendations. *International Business and Management*, 13(3), 45-52.
22. Odhiambo, N. M. (2022). Is export-led growth hypothesis still valid for sub-Saharan African countries? New evidence from panel data analysis. *European Journal of Management and Business Economics*, 31(1), 77-93.
23. Pesaran M. H., Richard, J., & Shin, Y. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16 (3), 289-326.
24. Riaz, S., Ahmad, I., Sheikh, A. I., & Wajid, A. (2024). Uncovering the Mystery of Tax Collection and Money Supply in Targeting Industrial Success: A Case Study of Singapore. *Journal of Asian Development Studies*, 13(3), 870-880.
25. Riaz, S., Saeed, A., Naushahi, M. M., & Nakitende, M. G. (2024). Revisiting Trade, Energy and Growth Nexus in Portugal: An Empirical Evidence from ARDL Approach. *Journal of Asian Development Studies*, 13(1), 755-763.
26. Shahbaz, M., Azeem, P., & Ahmad, K. (2011). Exports-led Growth Hypothesis in Pakistan: Further Evidence. *Asian Economic and Financial Review*, 1(3), 182-197.
27. Wang, J., Hassan, M. S., Alharthi, M., Arshed, N., Hanif, I., & Saeed, M. I. (2022). Inspecting non-linear behavior of aggregated and disaggregated renewable and non-renewable energy consumption on GDP per capita in Pakistan. *Energy Strategy Reviews*, 39, 100772. <https://doi.org/10.1016/j.esr.2021.100772>
28. World Bank (2024) World Development Indicators. World Bank, Washington, D.C.