

DECIPHERING DETERMINANTS OF EXPORT SOPHISTICATION: INSIGHTS FROM A PANEL ANALYSIS OF EMERGING ECONOMIES (BRICS) AND PAKISTAN

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ABSTRACT

The present study aims at highlighting the determinants of export sophistication in Brazil, Russia, India, China, South Africa (BRICS) and Pakistan. Empirical analysis is done on panel data of BRICS and Pakistan for the years 1996 to 2022. For empirical analysis Generalized Method of Moment (GMM) is used. Hausman test is used to suggest the fixed effect or random effect model. Results revealed on the basis of selected determinants. Results of term of trade, official exchange rate, political stability, globalization and capital formation exhibited positive and insignificant in case of BRICS and Pakistan. The term insignificant does not mean that these variables do not affect the export sophistication. It means that these positively associated determinants can play a key role in order to boost up the export sophistication in case of BRICS and Pakistan. While GDP per capita shows negative which is quite debatable. It means that those countries which have a negative fiscal and trade balance do not benefit from the sophistication of exports. Before entering export sophistication these countries need to be financially stable in case of trade by promoting exportable goods.

Keywords: Export Sophistication, Term of Trade, Official Exchange Rate, Political Stability, Capital Formation, GDP Per-capita, BRICS, Pakistan

INTRODUCTION

Trade economists have been concentrating on export sophistication for the past few years. The need for trade has grown in recent years due to the increasing demand for products and services. The composition of exports is a direct reflection of a country's productivity level. Similarly, export sophistication is determined by the export composition, which shows how close a country's export bundles are to those of high-income countries.

Regarding the technical characteristic that is unique to each country, the data reveals that it differs among commodities both within and between nations. Some commodities can greatly benefit a country's economy, while others will not. The general trend places low-income nations towards the very bottom of the list. (Weldemicael,

2014) A product's average weighted income (PRODY) also changes in a predictable way as its complexity increases. In addition, there is a direct correlation between GDP per capita and the level of export sophistication. Additionally, the lowest quintile countries have their impact on trade costs and technological advancements evaluated through the use of counterfactual experiments. According to the results, (Weldemicael, 2014) these nations are at a higher technological disadvantage than average, especially when it comes to more complex goods. For low-income nations looking to upgrade their export game, this has major policy implications. Technology transfer and reducing trade costs are now quite difficult for these nations.

A country's export sophistication can be defined as the level of technical content, added value, and complexity of its exported goods and services. Production and export of goods and services are gauged by the degree of technological and industrial improvement. More innovation, technology, and knowledge-intensive procedures are usually involved in sophisticated exports.(Aydin, 2016).

When competing on the global stage, nations with highly sophisticated exports have an advantage for a number of reasons. The export of high-value manufactured items, as opposed to low-value raw materials, is a stronger predictor of a country's GDP growth. The export of high-tech items necessitates state-of-the-art technical expertise, which has the potential to stimulate further innovation and economic expansion. Countries that export a wider variety of sophisticated items have a better chance of succeeding in the global market because they are less likely to depend on a few low-value export commodities.(Aydin, 2016)

There is a strong correlation between the sophistication of exports and the diversity of exports. It is possible that countries' exports will improve in sophistication as they expand into more modern and value-added businesses. The capacity to tap into new markets and industries is directly correlated to a country's export sophistication, which in turn determines its export diversification capabilities.

Thanks to technical progress, productivity skyrocketed in the last several decades, and exports shifted to include more complicated commodities. As a result of the advantages of exporting goods with high value addition, the export structure of numerous countries shifted towards more complicated items.

Considering the dynamic and comparative advantage differences across economies, a unique approach is required to achieve economic sophistication. Upon realising the advantages of exporting high-value-added commodities, the export structures of numerous nations shifted towards more complex products.

Problems with governmental supervision trap emerging economies. Because of their high inflation, public debt, fiscal deficits, and current

account deficits, emerging economies are in a very vulnerable financial position. The end of the extraordinary commodities and financial booms has put several large emerging economies in a vulnerable financial situation. To fix their governance problems and go forward at a fair development rate, they need to undertake major structural changes, but many politicians are unsure of what to do and are reluctant to make changes. Because of the state's involvement and cronyism, they are unable to escape. It is possible that the West may prioritise increasing its own wealth at the expense of guaranteeing open markets for everybody. Economic convergence is only getting started, but it looks like we've entered a gap that will last for a while. Improving their policies and governance to a far greater extent is the only way for developing economies to make up ground.

In order to accomplish their trade objectives, rising economies like BRICS (Brazil, Russia, India, China), SA, and Pakistan need to execute trade reforms that surpass conventional approaches. Russia and Pakistan rank lowest in terms of average exports, while South Africa, China, India, and Brazil rank top. Equally beneficial to economies like Brazil, South Africa, China, and India have been export trends. This indicates that five emerging nations are seeing an increase in their export shares, and that overall, exports are being used to meet the growing demand for exports. Russ GDP is now derived from sources other than exports, which is a major disappointment. It appears that expanding Russia's export market share has not been a top priority for the country. Russia still lacks a successful trade liberalisation strategy to increase exports. In their publication (Raghutla & Chittedi, 2020). Furthermore, it highlights the share of imports in five selected emerging market economies. On average, imports from South Africa, Brazil, and India are higher than those from China and Russia. These countries have adopted a strategy focused on exports.

The South African, Indian, Chinese, and Russian economies have been growing in importance over the past few decades. In 2022, the BRICS contributed 26% to global GDP and 21% to commerce. Also in the Global South, BRICS has

grown into a major player, contributing 64% to GDP. Roughly 40 countries have expressed interest in joining the group. Six countries—Saudi Arabia, Egypt, Iran, Ethiopia, Argentina, and the UAE—were invited to join the BRICS during the last meeting. The expanded BRICS grouping will account for 29% of global GDP. The Summit also revealed a number of other BRICS initiatives. These include resolving pressing issues affecting the Global South, including food insecurity, climate change, the digital divide, and reforms to multilateralism and the World Trade Organisation, as well as strengthening the New Development Bank and encouraging the use of local currencies in international trade and financial transactions within and between BRICS and their trading partners (UNCTAD,2023).

Present study is aiming at highlighting the determinants of export sophistication in Pakistan and selecting emerging economies BRICS. The second section is literature review, third is data and methodology, fourth is results and interpretation, fifth is conclusion.

LITERATURE REVIEW

In Sub-Saharan Africa, (Takpara et al., 2023) looked at how trade facilitation reform affected export sophistication. From 2004 to 2017, this research looks at Sub-Saharan Africa (SSA) to determine how trade facilitation reform affected export sophistication as evaluated by the Economic Complexity Index (ECI). It takes into account the physical infrastructure, information and communication technology, business and regulatory climate, border, and transportation efficiency as four measures of trade facilitation. Effective trade facilitation reform, with a focus on enhancing information and communication technology, border and transport efficiency, and the system Generalised Method of Moment, promotes the export of sophisticated goods in Sub-Saharan Africa, according to empirical analysis using Ordinary Least Square, Two-Stage Least Square, and system Generalised Method of Moment. These results point to the need for swift and comprehensive reforms in SSA nations to streamline border procedures. That is why it is critical to move quickly to execute the World

Trade Organization's Trade Facilitation Agreement if we want to reach this objective.

Whether or not OECD nations' export diversification and sophistication are affected by disaggregated energy use was the question investigated by (Rehman et al., 2023). A strong panel model evaluation. Achieving remarkable economic success through diversifying and sophisticating export growth has been a primary focus for most countries in recent years. Consumption of energy is necessary for this growing ascending process. In light of this, the research investigates whether or not, for OECD nations between 1990 and 2019, export diversification and sophistication policies are supported by disaggregated energy consumption (renewable and non-renewable). This research adds to the literature by developing and testing two new indices—export diversification and sophistication—and then using them as dependent variables in a model. In addition, the study uses the CS-ARDL approach to show that OECD nations, whose non-renewable energy consumption is more influential than renewable energy, can benefit from disaggregated energy consumption in terms of export diversification and sophistication. In addition, OECD nations' export variety and sophistication are boosted by regressors including foreign direct investment, human capital, and institutional quality. Last but not least, this study verifies the CS-ARDL method's results by using the System GMM (SGMM) strategy, which accounts for the endogeneity problem in the panel data. Based on the data that were examined, this study offers significant recommendations for policy.

A recent empirical study by (Huang et al., 2023) looked at how the new energy industry's export sophistication affects carbon emissions. From an export sophistication perspective, the existing literature has not thoroughly investigated the link between the new energy sector and CO₂ emissions. This study examines the effects of the new energy industry's export sophistication on CO₂ emissions, regional variability, and the mechanism by which it influences these variables. Data was collected from 31 major economies worldwide between 1996 and 2021 for this analysis. This conclusion remains after

robustness testing; the new energy industry's export sophistication has a greater impact on reducing carbon emissions in developed countries than in developing ones; the export sophistication of the new energy industry has a crowding-out effect on domestic technological progress, which partially hinders the carbon reduction effect; and the study found that the export sophistication of the new energy industry helps reduce carbon dioxide emissions. Theoretical recommendations for a world energy transition away from carbon emissions are offered by this paper's results.

Chinese manufacturing businesses' export sophistication, independent innovation, and intermediate import were studied by (Song et al., 2022). A database that combines information from the Chinese Customs Database and the Chinese Industrial Enterprise Database is the subject of a regression study in this article. The effect of intermediate imports on export sophistication can be confirmed empirically from an independent innovation standpoint. There are three sections to the results. The first thing to know is that intermediate imports have a favourable and substantial impact on manufacturing-independent innovation. However, the exact nature of this impact varies greatly depending on factors including business ownership, trade type, export target country, and technological strengths. Additionally, while independent innovation does increase export sophistication directly, it moderates the beneficial effect of inter-mediate imports, which is to say, it has a negative moderating effect. Third, between the nascence and growth stages, businesses are most positively affected by intermediate imports, whereas the growth and maturity stages are most positively affected by independent innovation.

An empirical investigation on the relationship between the export sophistication of new energy vehicles and the upgrading of China's industrial structure was explored by (Cao et al., 2022). Most automakers, including those in China, will soon cease manufacturing gasoline-powered vehicles and instead focus on developing alternative energy vehicles, a response to decades of efforts to reduce emissions from the transportation sector. Using panel data from 2010 to 2020 across

all 31 provinces in China, this study examines exports of energy vehicles. Given China's preponderance in processing trade, this study examines the export complexity of domestic energy vehicles after removing intermediate commodities. It uses static and dynamic panel models to measure the relationship between export sophistication and industrial upgrading. The domestic export sophistication of three major economic belts partitions was examined using heterogeneity tests. The findings showed that achieving China's industrial upgrading is possible with more sophisticated exports. Long-term, characteristics such as export sophistication, research and development, FDI, average GDP growth rate, market conditions, and human resources are favourably correlated with China's new energy vehicle sector. When it comes to regional strategy, the eastern and western regions see a greater impact from domestic export sophistication in boosting industry upgrading compared to the centre area. There will be a noticeable uptick in industrial production in western regions for every one unit improvement in export sophistication. Considering this, the export sophistication of China's new energy vehicles should rise, which will aid in the country's industrial upgrading.

The implications on trade sophistication were examined in the Vietnam-Korea FTA (Nguyen). Having gone into effect in December 2015, the South Korean-Vietnamese Free Trade Agreement (FTA) is the subject of this article. This research examines the evolution of these countries' trading connections by looking at their GDP, exports, and imports. The World Integrated commerce Solution (WITS) database, which details commerce between these two nations from 2010 to 2020, is used to compile this data. The data analysis was conducted using statistics on GDP, exchange rates, and FTA obtained from UNCTAD and WTO databases. The short-term effects of FTA on bilateral trade between these countries were estimated using the vector autoregressive function (VAR) test and a Granger causality test based on it. After that, the study delves into the features of the Impulse-Response function test to gauge the trade effects of FTAs in the long run. The data demonstrates

that in the medium run, FTA has a major impact on Vietnamese exports. The agreement has had a bigger impact on Korean imports to Vietnam in the long run, but the results do suggest that the two countries should reconsider the agreement and make changes to meet modern demands or implement trade promotion policies. The deal's results were very comparable to NAFTA's.

An essay on the topic of export sophistication was authored by (Aydin, 2016). There are a total of three chapters in this dissertation. These chapters show that a country's export bundle's sophistication could significantly affect economic growth using the export sophistication index that was created by Hausmann, Hwang, and Rodrik (2007). In addition, there is a strong relationship between export sophistication and income per worker; notably, certain nations have comparatively greater sophisticated ratings when compared to their levels of development. Furthermore, these nations have been successful in diversifying their exports from basic commodities to more complex commodities. This led to a dramatic rise in their export sophistication ratings across time. The third chapter delves into the question of whether export growth is directly proportional to total factor productivity or GDP growth, and if so, in what direction. Although export growth is not significantly related to TFP growth, the regression results demonstrate that TFP growth does affect export growth.

(Cabral & Veiga, 2010) investigated the economic and political aspects that influence the success of export diversification (ED) and export sophistication (ES) strategies in SSA countries, as well as how these strategies help to explain the progress made towards certain Millennium Development Goals (MDGs). Using de-identified data from the 48 SSA nations between 1960 and 2005, this research looks into the causes of ES and ED using independent regressions. The findings indicated that improved governance is considered a key factor in SSA's diversification and sophistication initiatives' likelihood of success. The extent to which exports are sophisticated and the breadth of diversification are both affected by the degree to which corruption, openness, and accountability are present. It appears from the data that SSA nations

with higher levels of human capital have better ED and ES. Workers' education correlates favourably with both ED and ES, with tertiary education being the most important factor in explaining ES. Part two of this study delves into the connections between ED and ES and growth, revealing proof that these variables contribute to stable growth in sub-Saharan Africa. It appears from this research that Sub-Saharan African nations with higher rates of ED and ES also have higher rates of population improvement.

For both rich and poor nations, (Abdmoulah, 2023) looked at what could affect the export sophistication index. This research used an index (EXPY) developed by Hausmann, Hwang, and Rodrik (2007) to determine the export sophistication values of a number of industrialised and developing nations. Afterwards, we ran second-generation panel data studies to see if some emerging nations may catch up to the developed world and what factors affect the export sophistication index. The empirical results show that FDI, total domestic savings, educational spending, and R&D expenditures are positively correlated with the export sophistication index. In particular, the current study's estimation results show that two emerging nations, Romania and Malaysia, can converge to industrialised countries in terms of export performance, but that Turkey and Bulgaria cannot. Therefore, in order to catch up to developed nations, emerging nations should prioritise raising their export sophistication index.

DATA AND METHODOLOGY

The empirical study of Pakistan, BRICS (Brazil, Russia, India, and China), and a variety of indicators from various factors is based on this data. Information for the World Bank's Index of Export Sophistication (EXPY) is culled from their World Integrated Trade Solution (WITS). The World Bank's Worldwide Governance Indicator (WGI) is a good source for data on political stability and other institutional variables. Information for the Globalization of Economy, Society, and Politics is sourced from the KOF Globalization Index (KOF Swiss Economic Institute). The World Development

Indicator (WDI) is the source for data on international financial flows, including FDI, gross capital creation, term of trade, official exchange rate (OFER), and world GDP per capita. The years 1996–2022, inclusive, are used as panel data.

(Hansen, 1982) formalized Generalized Method of Moment (GMM), which is one of the most used methods for estimating models in financial and economic analysis. GMM is used for empirical investigation due to its validity.

Export Sophistication Results Using Pannel of Emerging Economies (BRICS) and Pakistan

$$EXPY_{it} = \beta_0 + \beta_1 WGDP_{it} + \beta_2 TOT_{it} + \beta_3 OEXR_{it} + \beta_4 CONSUSDOL_{it} + \beta_5 POLSTAB_{it} + \beta_6 KOFGI_{it} + \beta_7 GCFANGRO_{it} + \mu_{it}$$

t=1996,1997,1998,.....2022
i= Cross Sections

- EXPY=Export Sophistication (Index)
- WGDP=World GDP Per Capita
- TOT= Term of Trade
- OEXR= Official Exchange Rate
- POLSTAB=Political Stability
- CURLCU01=GDP Per Capita Current LCU
- KOFECGI= Globalization (Index)
- GCFRCLCU=Gross Fix capital formation
- FDINETBOP=Foreign Direct Investment

Table 1
Descriptive Statistics

	EXPY	WGDP	TOT	OFEX	CONSUSDOL	POLSTAB	KOFGI	GCFANGRO	C
Mean	16674.12	9383.766	103.2679	34.51501	5151.538	-0.818904	59.93730	5.293271	1.000000
Median	16814.55	9309.046	99.78100	15.56727	5818.526	-0.649910	61.91000	5.441288	1.000000
Maximum	20952.22	11287.15	273.0755	204.8672	11560.33	0.327800	72.15000	75.20113	1.000000
Minimum	12456.53	7197.880	67.39410	1.005100	665.4661	-2.810035	41.46000	-45.19983	1.000000
Std. Dev.	1996.388	1136.050	25.75105	37.91123	3279.100	0.715226	7.854015	12.43720	0.000000
Skewness	0.035542	-0.198568	3.590289	1.659228	0.018115	-1.078052	-0.481144	0.393964	NA
Kurtosis	2.913742	2.040611	21.34129	6.337281	1.562315	3.626313	2.339784	11.52389	NA
Jarque-Bera	0.073918	6.379014	2295.451	131.0517	12.23715	29.82625	8.057806	433.5587	NA
Probability	0.963715	0.041192	0.000000	0.000000	0.002202	0.000000	0.017794	0.000000	NA
Sum	2367725.	1332495.	14664.04	4901.131	731518.4	-116.2844	8511.096	751.6445	142.0000
Sum Sq. Dev.	5.62E+08	1.82E+08	93499.43	202653.9	1.52E+09	72.12837	8697.662	21810.44	0.000000
Observations	142	142	142	142	142	142	142	142	142

The above-mentioned table explains the descriptive statistics of the data used in the analysis. These results show that the data is well organized for analysis.

Correlational Matrix (Covariance Analysis)

Sample: 1996 2021
 Included observations: 142
 Balanced sample (listwise missing value deletion)

Correlation	EXPY	WGDP	TOT	OFEX	CONSUSDOL	POLSTAB	KOFGI	GCFANGRO	C
t-Statistic									
Probability									
EXPY	1.000000								
WGDP	0.043415	1.000000							
TOT	-0.410338	-0.092847	1.000000						
OFEX	-0.597487	0.256311	0.121664	1.000000					
CONSUSDOL	0.428305	0.314959	-0.067258	-0.525691	1.000000				
POLSTAB	0.578127	-0.032423	-0.112035	-0.791451	0.588438	1.000000			
KOFGI	0.361315	0.340373	-0.219023	-0.284810	0.602719	0.366873	1.000000		
GCFANGRO	0.177223	-0.121038	-0.079763	-0.073793	-0.089687	-0.013066	-0.086190	1.000000	
C	NA	NA	NA	NA	NA	NA	NA	NA	NA

Panel Generalized Method of Moments

Dependent Variable: EXPY

Sample (adjusted): 2003 2022

Periods included: 20

Cross-sections included: 6

Total panel (unbalanced) observations: 118

2SLS instrument weighting matrix

Instrument specification: C WGDP(-1) TOT(-1) OFEX(-1) CONSUSDOL(-1)

POLSTAB(-1) KOFGI(-1) GCFANGRO(-1)

Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-412457.9	8717588.	-0.047313	0.9623
WGDP	22.55966	451.3707	0.049980	0.9602
TOT	1170.957	24974.35	0.046886	0.9627
OFEX	43.35793	1411.115	0.030726	0.9755
CONSUSDOL	-1.409350	28.24970	-0.049889	0.9603
POLSTAB	3170.161	61050.96	0.051926	0.9587
KOFGI	1163.252	22370.26	0.052000	0.9586
GCFANGRO	5045.528	102537.6	0.049207	0.9608
R-squared	-657.051617	Mean dependent var		16725.13
Adjusted R-squared	-698.927629	S.D. dependent var		2049.777
S.E. of regression	54229.21	Sum squared resid		3.23E+11
Durbin-Watson stat	2.107644	J-statistic		6.20E-18
Instrument rank	8			

Above mentioned table shows the results of panel GMM. WGDP shows positive and insignificant in case of Pakistan .A unit increase in WGDP will increase EXPY by 22.55966units .TOT shows positive and insignificant in case of Pakistan .A unit increase in TOT will increase EXPY by 1170.957 units.OFEX shows positive and significant results .A unit increase in OFEX will increase EXPY by 43.35793.GDP shows negative sign in case of Pakistan.A dollar increase in GDP per capita will decrease the

EXPY by \$ -1.409350.Political stability shows a positive and insignificant results in case of Pakistan .A unit increase in Political stability will increase EXPY by 3170.161 units. Globalization shows positive and insignificant results. A unit increase in globalization will increase EXPY by 1163.252 units.Gross capital formation shows positive and insignificant results .A unit increase in gross capital formation will increase EXPY by 5045.528.

Hausman Test

The Hausman test is a method utilized in econometrics to evaluate the suitability of selecting between fixed effects and random effects models in the study of panel data. In present analysis the Hausman test suggested Random Effect model

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	4.449279	6	0.6161

Random effects test

Sample (adjusted): 1996 2022

Periods included: 24

Cross-sections included: 6

Total panel (unbalanced) observations: 142

WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17620.35	1946.926	9.050341	0.0000
WGDP	NA	NA	NA	NA
TOT	-24.74655	5.271297	-4.694585	0.0000
OFEX	-22.95024	6.940362	-3.306779	0.0013
CONSUSDOL	-0.016147	0.065284	-0.247334	0.8051
POLSTAB	410.3767	337.4644	1.216059	0.2265
KOFGI	44.24047	31.03480	1.425512	0.1568
GCFANGRO	31.92930	12.09390	2.640116	0.0095

Effects Specification

Period fixed (dummy variables)

R-squared	0.557681	Mean dependent var	16674.12
Adjusted R-squared	0.443153	S.D. dependent var	1996.388
S.E. of regression	1489.749	Akaike info criterion	17.63581
Sum squared resid	2.49E+08	Schwarz criterion	18.26028
Log likelihood	-1222.143	Hannan-Quinn criter.	17.88957
F-statistic	4.869351	Durbin-Watson stat	0.104458
Prob(F-statistic)	0.000000		

Random Effect show the same results as Panel Least square model.official exchange rate and term of trade have negative affect on export sophistication while WGDP,GDP per capita,political stability,globalization and gross fix capital formation has positive effect on export sophistication.

	Random Effect			OLS			GMM		
	Coeff	t-Stat	P-value	Coeff	t-Stat	P-value	Coeff	t-Stat	P-value
C	17620.35	9.050341	0.0000	17187.33	10.89786	0.0000	-412457.9	-0.047313	0.9623
WGDP	NA	NA	NA	0.184721	1.398625	0.1642	22.55966	0.049980	0.9602
TOT	-24.74655	-4.694585	0.0000	-23.35487	-4.907952	0.0000	1170.957	0.046886	0.9627
OFEX	-22.95024	-3.306779	0.0013	-19.85961	-3.385983	0.0009	43.35793	0.030726	0.9755
CONSUSDOL	-0.016147	-0.247334	0.8051	0.012231	0.214890	0.8302	-1.409350	-0.049889	0.9603
POLSTAB	410.3767	1.216059	0.2265	591.3395	2.054827	0.0418	3170.161	0.051926	0.9587
KOFGI	44.24047	1.425512	0.1568	19.10671	0.975603	0.3310	1163.252	0.052000	0.9586
GCFANGRO	31.92930	2.640116	0.0095	23.93891	2.487267	0.0141	5045.528	0.049207	0.0608

The above mentioned results shows panel least square estimates. Results show World GDP per capita show positive and insignificant in case of EXPY as dependent variable. As a unit increase in WGDP per capita the EXPY will increase by 0.184721.Term of trade shows negative and highly significant in case of export diversification .A unit increase in TOT the EXPY will decrease

by -23.35847.Official exchange rate show negative and significant results. A unit increase in Official exchange rate will decrease the EXPY by -19.85961.GDP per capita show positive and insignificant results. A dollar increase in GDP per capita the EXPY will increase by 0.012231.Political stability show positive and significant results .A unit increase in political

Residual Cross-Section Dependence Test

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled

Periods included: 24

Cross-sections included: 6

Total panel (unbalanced) observations: 142

Note: non-zero cross-section means detected in data

Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	84.46119	15	0.0000
Pesaran scaled LM	12.68182		0.0000
Pesaran CD	-0.896334		0.3701

RESULTS AND DISCUSSION

When looking at the export sophistication of BRICS and Pakistan, the term of trade reveals positive but minor findings using the GMM of panel data. An improvement in the term of trade is frequently a sign that export prices are on the rise relative to import prices, which is expected to be accompanied by an increase in export sophistication. The present economic situation may be to blame for this, as it encourages the production and sale of ever-more-complicated goods. Similar to the terms of trade for developing nations' primary commodities, the terms of trade for manufactured exports have demonstrated a long-term trend that favours wealthy nations that import them. A more refined TOT will increase the product's technological and input factor complexity. According to research (Saadi, 2012), TOT is a key factor in determining the level of complexity in exports. We can use this study to support our present.

Pakistan and the BRICS export sophistication panel both exhibit a positive but statistically insignificant relationship with the official exchange rate. There are two key reasons why the exchange rate is a focal point. The first is that preliminary assessments have shown that ER has played a crucial role in the success stories of developing countries as they have caught up to and converged with industrialised economies. Second, in regards to short-term capital inflows, commodities export bonanzas, and trade improvements, growing economies are presently discussing the benefits and drawbacks of local currency appreciation, which is a fall in the ER. A higher official exchange rate may represent a stronger domestic currency, which may be an indication of better export sophistication. This might be due to a number of factors, including increased competition in domestic businesses or simpler access to foreign commodities and technology. According to the idea put forth by (Saadi, 2012), the results of the current investigation are justified.

In the examples of BRICS and Pakistan, export sophistication is negatively and insignificantly affected by GDP per capita. There appears to be no consistent relationship between changes in GDP per capita and changes in export

sophistication in the BRICS and Pakistan panels, at least based on the data that is currently available. An increase in information, revenue, productivity, and R&D across the board is necessary for capital creation. The effects of a negative trade balance, fiscal deficit, and trade deficit on the current study's findings are debatable. When developing economies try to cover their export sophistication expenditures, they run out of resources and have to import goods and services. This can have a negative effect on GDP per capita if it isn't high enough to meet production demand. (Kočenda & Poghosyan, 2018) stated that export sophistication is strongly influenced by GDP per capita.

When looking at the BRICS and Pakistan, we see that political stability has a positive but insignificant effect on export sophistication. Productivity rises as a result of people being more inclined to invest in a politically stable and favourable climate. Institutions are a measure of political stability, and a robust role for institutions can boost export sophistication. Here, export commodities with higher levels of complexity or technology content are associated with a more stable political climate. A more conducive environment for economic growth, increased investor confidence, and stable policies are all potential reasons. According to research by (Zhang & Yang, 2016), political stability is a good measure of export sophistication. When it comes to Pakistan, political stability is a key indicator.

When looking at the export sophistication of BRICS and Pakistan, globalization has both a positive and a negligible effect. The idea of globalization encompasses more than just one thing. Economic globalization encompasses a wide range of phenomena, including but not limited to financialization, capital flows, trade duties, and trade liberalization. Internet use, however, is associated with social globalization. An significant determinant of export sophistication is globalization, which boosts all elements such as innovation, technology, research and development, export quality, per capita income, and growth. One major factor in

export sophistication is globalization, according to research (Nguea & Fotio, 2021)

In the cases of BRICS and Pakistan, capital formation has a positive but insignificant effect on export sophistication. If exports rise, the country's finances will improve, and money will flow in at a rapid rate. According to the data, a nation can diversify its production base more quickly if it prioritizes capital development and spends a bigger portion of its output on it.

CONCLUSION OF STUDY

Results of term of trade, official exchange rate, political stability, globalization and capital formation exhibited positive and insignificant in case of BRICS and Pakistan. The term insignificant does not mean that these variables do not affect the export sophistication. It means that these positively associated determinants can play a key role in order to boost up the export sophistication in case of BRICS and Pakistan. While GDP per capita shows negative which is quite debatable. It means that those countries which have a negative fiscal and trade balance do not benefit from the sophistication of exports. Before entering export sophistication these countries need to be financially stable in case of trade by promoting exportable goods.

Policy Recommendation

In BRICS and Pakistan government should design such policies which support term of trade policies, official exchange rate, political stability, globalization, capital formation and GDP that can promote export sophistication in order to improve trade balance and economic conditions.

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