



Comparative Industrial Analysis of Selected Countries with Special Reference to Pakistan: Product Space Perspective

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ARTICLE INFO	ABSTRACT
Article History: Received: January 16, 2025 Revised: February 17, 2025 Accepted: February 20, 2025 Available Online: February 21, 2025	<p><i>This study aims to focus on discovering the role of the sophistication in export diversification. The relatedness and connectedness of the products shown in the product space model (PSM) allows countries to accomplish future industrialization in a systematic manner that lead to sustainable economic growth. The acquisition of modern trade policies helps to flourish the unexploited exports. To analyze the impact of export diversification on economic growth, we have taken the cross sectional export data of 150 countries for the year of (2021) and the current study is based on secondary data. Firstly, we find the level of sophistication of a product and then find the overall sophistication of a country for future industrialization. Moreover, the revealed comparative advantage (RCA) index has been used to evaluate the comparative advantage of the selected four South Asian countries namely; Pakistan, India, Bangladesh and Afghanistan and it was found that India has relatively high number of RCA products in its export basket, and thus closer to fully exploit the remaining unexploited, non-RCA products for export diversification, while Pakistan and Bangladesh have moderate level of opportunities considering their position in product space. Afghanistan's exports are located mostly in the peripheral area of product space, where moving to non-RCA products are relatively more challenging.</i></p>
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Introduction

A strong export oriented industrial base, comprises of manufacturing and service sectors are the key determinants of successful industrialization that lead to sustainable economic development in a country. Export diversification is a way that helps a country to achieve maximum output from exports by adding high value products in its export basket. Developing countries like Pakistan needs to switch from traditional exports of less value-added products to high-value-added products including high-tech technological products, because this kind of product can earn more return than any ordinary product. Technology helps to improve the country's export abilities through the expansion of market reach, it brings efficiency and also enhances productivity, and maximizes the benefits of trade.

The success of diversification of exports are different in countries because of having different cultural, social, and political situations. The consumer's choices are being made based on the cultural boundaries and preferences that influence the demand for any kind of product and services. Along with that, the political condition of a country allows them to expand their exports as well and the decisions made by the government can either facilitate the trade policies or otherwise obstruct the export diversification.

Stephen E GUISENGER's (1976) analysis of developing economies for the previous years has shown magnificent proof that the procedure of development and progress is homogenous in most of the economies of the world e.g. The political cultural and social conditions of these countries are largely similar but Kuznets indicates other important factors impacting the development that are saving, share of gross national product and market share of industries.

AR Kemal (1998) since Pakistan gained independence, it has been facing industrial crises. The structural transformation of the industrial sector is facing the insufficiency of export diversification. The exports of Pakistan are still traditional and have low value addition. The sophistication of the production is low in the exports of Pakistan because most of the production of Pakistan are of primary goods and resource based goods. Developing countries need to move from low-value product exports to high value-added products. In initial stages of development, agricultural sector is considered as key to achieving sustainable economic growth. (Slaho Kalpana and Sethi Narayan 2012) in India it is considered that stabilizing agriculture sector is a necessary factor for survival and food security.

(Mohammad s Anwar 2019) industrialization and high-value exports are pathways to economic growth and development. As the developing countries export primary products that may not contribute to GDP in a significant manner as the countries needed, because the income elasticity of the primary commodities is low-priced and cheap.

The expansion and diversification of exports mostly have a positive impact on economic growth. Whereas the results of each case of any country vary from the others. It also has a different influence of exports and on economic growth. Developing economies mostly do not go to the expansion of their exports they rely on the traditional mode of exports due to which they are unable to gain sustainable growth. Expanding the horizon of export paves the way for development and a strong image in the international trade market.

Export diversification has a different impact on each country. Each country has different cultural, social, and political conditions, but there may exist some similarities because of having the same geographical conditions e.g. agricultural countries will export more agricultural and forestry

products. The other determinant is the capital-intensive and labor-intensive products. The inclusion of high valued sophisticated goods help earns more profit than the country that is exporting perishable primary products. The dependence of developing countries on primary goods has relatively adverse impact on their future economic growth.

Research questions

- How to assess the net productive capability of country and use a systematic approach to achieve successful industrialization in a country?
- How does the level of sophistication of exportable products enhance the productive capacity of developing economies?
- How export diversification helps to increase the economic growth of a country?

Objectives of the study

- To analyze the net productive capability of country and using a systematic approach to achieve successful industrialization in a country.
- To analyze the impact of sophisticated exports that enhance the productive capacity of developing economies.
- To analyze export diversification impact on economic growth of a country.

Problem statement of the study

Pakistan's industrial sector is faced with various issues that hamper export diversification and successful industrialization. A comparative industrial analysis of selected countries is required to better formulate industrial policies in a more feasible manner. This study is focused to identify the systematic approach to achieve export diversification while using product space model. PSM model is highly instrumental to find feasible pathways to successful industrialization in any country.

Significance of the study

This study will provide a pathway for the policymakers of a country to develop feasible trade policies compatible with the productive structure through export diversification. Export diversification of products benefits a country to reduce the dependency on a limited set of products and enhances the competitiveness of the economy.

Research Methodology

The technique that is employed in the study is Product Space Model (PSM) that indicates the level of sophistication of exports. Along with this model, revealed comparative advantage known as (RCA) index is being used to show the comparative or weighted average of the product in the global market. PSM indicators, i.e., PRODY and EXPY are used in the study.

The study is quantitative, where the investigation is based on the export data of 150 countries. This study includes an overview of different industrial sectors of the selected countries that show their mode of production and the income share associated with them. The study further seeks to identify the sophistication of export products. The study investigates the relationship between the diversification of exports and economic growth.

$$RCA_{k,j} = \frac{X_{k,j} / \sum_k X_{k,j}}{\sum_k X_{k,j} / \sum_k \sum_j X_{k,j}} \quad Eq. 1$$

RCA and non-RCA measures have been analyzed to check the efficiency level of exports of the studied countries.

Analysis and discussion

A thorough analysis of the selected countries is provided to better analyze the potential opportunities and challenges these countries face for future industrialization.

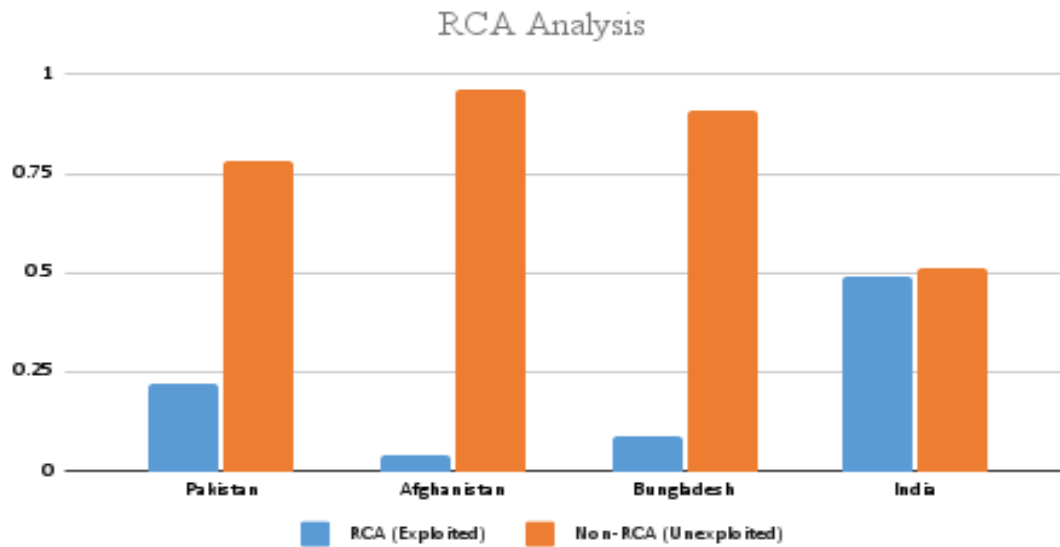


Figure 2. RCA and Non-RCA Products of the studied countries.

Figure 2 represents the revealed comparative advantage of four countries Pakistan, India, Bangladesh, and Afghanistan. The RCA products of Pakistan is 22% and 78% are non-RCA products. Afghanistan has mere 4% of RCA products, while 96% of the products are unexploited or non-RCA. Bangladesh has 9% exploited and 91% unexploited, non-RCA products. India has 49% exploited and 51% unexploited RCA.

From the total of 4284 products, Pakistan is efficiently exporting 762 and 3522 products are non-RCA or yet to be exploited. Afghanistan is efficiently exporting 146 products out of 4284 whereas the non RCA products are 4138. While Bangladesh is effectively exporting 363 products with RCA from the total of 4284 products. India has exploited 49% products and 51% are yet to be exploited. Among the studied countries, India is in a better position to move to the unexploited products because of its strong position in products space.

Table 1. RCA exploited and RCA unexploited

Country name	RCA(exploited)	Non RCA(unexploited)
Pakistan	22%	78%
Afghanistan	4%	96%
Bangladesh	9%	91%
India	49%	51%

Prody And Expy Analysis

PRODY is used to measure the product level sophistication of a product and income level associated with it. PRODY is measured using equation II.

$$PRODY_j = \sum_k \frac{X_{k,j} / \sum_j X_{k,j}}{\sum_k (X_{k,j} / \sum_j X_{k,j})} \times y_k \quad (Eq. II)$$

Whereas, the EXPY index is used to measure the sophistication of all the exported products of a country. EXPY is measured using equation III.

$$EXPY_k = \sum_c \left(\frac{X_{k,j}}{\sum_j X_{k,j}} \right) \times PRODY_j \quad (Eq. III)$$

To develop an EXPY and PRODY, HS06 digit data is used that is the harmonized system code developed by UN-Comrade. Based on the results, it is observed that EXPY values of the selected countries are classified in three categories; high, medium, and low. The EXPY OF India is the highest among all of them with a value of 28392 and Pakistan has an EXPY of 15395, it means that the sophistication level of exports of India is much higher than that of Pakistan. On the other hand, Bangladesh and Afghanistan have lower EXPY in comparison with Pakistan. Afghanistan EXPY is 9679, which is the lowest among the selected countries.

Table 02: PRODY classification

PRODY ranking	PRODY classification	Pakistan Exported products	RCA Products
High-income potential	Above 30000	1703	109
Medium income potential	Between 20000 to 30000	788	192
Low-income potential	Below 20000	853	461

We calculated PRODY for the export products of Pakistan, and categorized PRODY into three categories, which include high income potential, medium income potential, and low income potential. Above 30000 PRODY value, the level of Pakistan exported products are 1703, and the RCA products are 109 which means that Pakistan is currently effective exporter of 109 products. In medium income potential category, the number of the exported products are 788, and the RCA products are 192, which means between 20000 to 30000, Pakistan is currently exporting 192 products efficiently.

The low income potential category shows that below 20000 PRODY value, Pakistan exported 853 products and 461 RCA products. The classification of the products into these categories explain thoroughly the level of the sophistication of these products. The results indicate that with some coordinated effort, Pakistan can be the efficient exporter of the current non-RCA into exploited RCA.

Table 03: Selected Countries Economic Outlook

Countries	Exports in (billion)\$	Total RCA products	Average PRODY of RCA products	EXPY
Pakistan	31.6	762	19268	15395
Bangladesh	51.4	363	16522	11801
India	368.8	1417	26973	28392
Afghanistan	1.8	146	18122	9679

Having analyzed the exports of the selected countries in Table 03, total RCA products, the average PRODY of RCA products, and the EXPY of these products are presented, where the exports of Pakistan are 31.6 billion \$, the total RCA products are 762, the average PRODY of RCA products is 19268 and the EXPY is 15395. Bangladesh has exports of 51.4 billion \$, total RCA products of 363, the average PRODY of RCA products is 16522, and the EXPY is 11801 that show medium level of sophistication of their economies.

India has 368.8 billion \$ exports, total RCA products are 1417, average PRODY of RCA products 26973 and its EXPY is 28392 that show higher diversification and sophistication on Indian economy. While, Afghanistan exports stand at 1.8 billion \$, the total RCA products are 146, the average PRODY of RCA products is 18122, and the EXPY is 9679, which indicates lower level of sophistication.

Among all these countries, the exports of India are the highest. The number of RCA of India is the highest which means that the level of exported products in India is diverse and sophisticated. Afghanistan has the lowest exports and the number of RCA products are low, which means that the country is not exporting sophisticated products efficiently.

Practical and Theoretical contributions

Product Space Model provides a theoretical framework for evaluating the level of sophistication of exports goods both at product levels and country levels. It also evaluates the potential of a country's degree of innovation and sophistication for future industrialization. PSM provides a systematic intervention to raise the level of sophistication and diversification potential of the selected countries. It identifies the best industrial sector to invest to encourage the manufacture and export of high-end, sophisticated products. This can help players in the industry and policymakers to concentrate their attention and resources on the areas that present the most potential for advancement and growth.

Policy Recommendations

Production process requires technical skills, technology, capital, infrastructure and coordinated efforts from the major stakeholders in a country to make it successful. This study investigates the productive capabilities of the selected countries and suggests viable and feasible unexploited sectors aligned with their capacities, for future industrialization. PSM results revealed that some countries are in a better position for industrialization, i.e., India, while Pakistan and Bangladesh have moderate level of challenges. Afghanistan is faced with high level of challenges for industrialization. Following are measures suggested for the studied countries to bridge the gaps for future industrialization.

i. Coordination Mechanism

Successful industrialization is the result of coordinated efforts of all the stakeholders. Coordination among the relevant institutions to facilitate the industrial growth is imperative. Absence of coordination is characterized by coordination failure that is common in developing countries.

ii. Public Private Dialogue

In the process of industrialization, private and public sectors are the major players. In developed countries, private sector is considered the backbone of the economy. Without private sector

engagement, industrialization will never succeed in any country. For successful industrialization, private sector inputs be included in the decision making process.

iii. Establishment of Industrial Zones

Industrial zones are established to expedite the industrial process in a control environment, where catering the facilities needed for industrialization is relatively easier. The selected countries may opt this option for their future industrializations.

Conclusion

The study of industrial analysis of Pakistan aims to address the importance of export diversification and level of sophistication to avail economic growth through exports. The RCA analysis showed that the efficiency of exports in Pakistan is not up to the mark. They have a low level of sophistication of products that they are currently exporting they need to move towards innovation and inclusion of technology to acquire appropriate return from their exports. In comparison with other studied countries, India and Pakistan have less exports in the global market. RCA exports of the 22% shows the sophistication of exports. PRODY and EXPY indicators directed the complexity and importance of high-tech value-added products in return for getting high output from exports. Export diversification is the ultimate way to enhance growth and achieve a sustained developed economy.

Limitations of the study

Difficulties in Implementing Policies: The practical applications of recommended strategies may encounter with obstacles including political opposition, resource shortages, and bureaucratic inefficiency. The study may not have taken into consideration the difficulties in implementing policies in practice.

Socio-Political Factors: A nation's economy can be significantly impacted by its socio-political factors such as trade agreements, policy interventions, and regional conflicts. The study's analysis may not go as far as it could to factor in all these factors.

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