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Export Diversification and Revealed Comparative Advantage

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INTRODUCTION

The prevailing situation in the trade sector is quite precarious due to the growing trade deficit. The trade deficit rose from Rs. 925.0 million in 1974/75 to Rs. 19011.9 million in 1991/92. Unless some stringent steps are taken, the rate of increase in trade deficit will continue to have an adverse impact on the balance of payments (BOP).

Between the First Five Year Plan (1956/57-1960/61) and the Fourth Five Year Plan (1970/71-1974/75), there was hardly any change in both countrywise and commoditywise trade diversification. In 1974/75, India's share in Nepal's total trade was more than 80 percent and its share in total export and total import was 84 percent and 81 percent, respectively. By 1979/80, its share in total trade had plummeted to about 50 percent. Although it rose slightly to 52 percent in 1984/85, it again decelerated to 28 percent by 1991/92. In terms of exports and imports, the share of India was 11 percent and 36 percent, respectively, in 1991/92.

With regard to commodities, the principal commodities exported to India comprised of timber, rice, mustard and linseeds, ghee, and dried ginger in 1974/75. In the early 1980s, raw jute and jute goods were added to the export list. There were seven major commodities exported to India in 1991/92 which formed 40 percent of exports to India, but just 5 percent of total exports. These included, in order of value, jute goods, catechu, rice-bran oil, ginger, mustard and linseeds, oil cake and live animals. With regard to overseas countries, jute, jute goods, and handicrafts formed 59 percent of exports to overseas countries and 11 percent of total exports. In 1991/92, carpets, readymade garments, and pulses constituted 92 percent of exports to other countries and 82 percent of total exports.

During the Seventh Five Year Plan (1985/86-1989/90), some policies were implemented which had a favourable impact on the trade sector. They were, *inter alia*, introduction of advance quota distribution system for the export of readymade garments, reduction to a minimum on the number of exportable products under banned items or QRs, introduction of a duty drawback scheme and bonded warehousing system coupled with the pre-tax exemption, waiving of income tax on exports, placement of imports of inputs for exports under the OGL, and pursuance of liberal import procedures on those inputs not included in the OGL list. However, these measures were not adequate enough to sustain the continuous growth of the trade sector.

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OBSTACLES

Export diversification focused on third countries only without scrutinizing the product/market specific strategy. Further, no step was undertaken to explore into the possibility of utilizing or mixing foreign and domestic resources to meet the market demand.

The bureaucratic management of the economy which brought about delays and imposed considerable uncertainty also hampered the growth of potential exports. These uncertainties were inevitable, given the tendency to make regular changes in policies and the *ad hoc* administration of the system. Moreover, reliable access to raw materials at international prices appeared to have been a paramount circumscription for some export-oriented industries.

Other internal factors were also responsible for the poor performance of exports. First, for a long time, the exchange rate was overvalued which lowered the profitability of exports, relative to production of non-traded good. Further, at times the paucity of foreign exchange (at the overvalued exchange rate) led to difficulties for exporters in procuring imported inputs, causing delays in production and inability to plan ahead to meet orders. The exchange rate policy was part of an integrated approach to protection which was inward-oriented. Firms were encouraged to produce for the domestic market by way of restriction on imports and a cascading tariff structure. This led to a degree of anti-export bias which was not offset by specific export incentives. The imposition of tariffs on imported inputs utilized in export production increased the cost of production and lessened the competitiveness of Nepal's exports.

EXPORT PERFORMANCE AND DIVERSIFICATION

The determinants of export performance for Nepal are analyzed by employing a model formulated by Love (1984). The export performance is typically decomposed into those parts arising from the growth of market demand, changes in the competitive standing, and diversification of commodity composition. This has been done due to the constraints in defining and quantifying explanatory variable sets and also due to the conceptual and practical difficulties in specifying the degree and structure of protection.

It is assumed that Nepal's trade performance is determined by external market conditions for traditional exports, its ability to compete in world market (mostly in India) and its diversification of the commodity composition of exports.

The export performance function is specified as:

$$X = f(M, C, D) \qquad \ldots (1)$$

where, X stands for export earnings, M for external market conditions, C for competitiveness and D for diversification.

Hypothesis, Methodology and Data

External Market Conditions

World market conditions for specific products are governed by the interaction of aggregate demand and aggregate supply. The value of world trade in a particular product is assumed as an indicator of external market conditions for that product.

M_t, an index of market conditions in year t for the set of commodities a country traditionally exports, can be denoted as:

$$M_t = \sum_{i=1}^{j} W_{it} \cdot V_{it} \qquad \ldots (2)$$

where, for $t=1...n$, W_{it} indicates the share of commodity i in Nepal's export earnings in time t and V_i stands for an index number for the value of world trade in commodity i with $V_i = 100$ for $t=1$, and j denotes the number of Nepal's traditional exports.

The value of Indian trade of each commodity under study has been incorporated to estimate M_t because of lack of data on world trade of a particular commodity. The index of market conditions for the group of commodities Nepal traditionally exports has been computed as the sum of the product of the share of each commodity exported and the index for the value of Indian trade in a particular commodity.

Competitiveness

Domestic factors, both spontaneous and policy-induced, affect export performance through their influence on the country's market shares. When the external market conditions deteriorate, for instance, a country may offset, wholly or partially, any decline in earnings and may even increase earnings if improvements in its competitive position enable it to raise its market shares. It is hypothesized in this context that the impact of competitiveness will be depicted in differences between actual market shares and market share norms. However, defining a country's share norm is quite arbitrary. In Nepal's case the country's share norm for a given commodity will be taken as the average of the observed market shares in the immediately preceding four years.

A measure of Nepal's overall competitiveness is developed by summing the product of the share of a particular commodity in the country's export earnings and the ratio of actual market share and market share norm. The limitation associated with this simplified version is that it cannot explicitly reveal the influences of individual supply-side variables.

Thus, a measure of Nepal's competitiveness for year t, C_t, may be then denoted as:

$$C_t = \sum_{i=1}^{j} W_{it} \ (m_{it}/s_{it}) \qquad \ldots (3)$$

where, m_{it} represents the *ith* commodity's actual market share, s_{it} represents the market share norms and m_i/s_i is set equal to 100 for $t=1$.

Diversification

Whether a country is able to abate its dependence on a few exportable products can be tested by the degree to which an index of concentration is reduced. Hence, a series

for diversification is prepared by incorporating the square root of the sum of the square of the share of commodity in total export earnings.

D_t, an index of concentration in year t, using the Gini-Hirschman coefficient is calculated as:

$$D_t = \left(\sum_{i=1}^{k} W_{it}^2 \right)^{1/2} \quad \ldots (4)$$

where, k is the number of products exported by Nepal, w_i indicates the share of commodity i in total export earnings, and D_t is set equal to 100 for $t=1$.

Export figures for raw jute, jute goods, herbs, mustard, leather, handicrafts, garments, carpets, oil-cakes, and pulses which account for more than 80 percent of total exports have been taken into account. The period covered is from 1980/81 to 1990/91.

RESULTS

Data are prepared for M_t, C_t, and D_t as shown in Table 1. The regression equation, in log form, emerges out as follows:

$$\ln X_t = 8.1095 + 1.8467 \ln M_t + 0.6527 \ln C_t - 2.6448 \ln D_t \quad \ldots (5)$$
$$(3.5523) \qquad (1.8913) \qquad (-2.4403)$$

$$R^2 = 0.9051 \qquad DW = 2.3511 \qquad \bar{R}^2 = 0.8644$$

The Durbin Watson statistic demonstrates the absence of serial correlation. Because the coefficient of the market variable, M, is positive and statistically significant at 99 percent level of confidence, this implies that the external market conditions are important factors in determining export performance. The coefficient of C, the competitiveness variable, is positive and statistically significant at 90 percent level of confidence. This indicates that both spontaneous and policy-induced factors affect export performance through their impact on the country's market share. Nevertheless, a comparison with the coefficient of M divulges a greater sensitivity of exports to C; in other words, external market conditions have more emphatic roles in raising exports than competitiveness. The negative coefficient of D which is statistically significant at 95 percent level of confidence suggests that internal factors that influence the mobility of resources exist.

REVEALED COMPARATIVE ADVANTAGE

In this section an attempt is made to compute the revealed comparative advantage (RCA) and to see how the bundles of goods in which Nepal has displayed a comparative advantage/disadvantage changed over a period of time.

The RCA of various industries are divided into 10 commodity groups according to SITC classification. Where, SITC commodity groups are defined as: 0 = food and live animals, 1 = tobacco and beverages, 2=crude materials, inedible, except fuels, 3=minerals fuels and lubricants, 4=animal and vegetable oils and fats, 5=chemical and drugs, 6=manufactured goods classified by materials, 7=machinery and transport equipment, 8=miscellaneous manufactured articles, and 9=commodity and transaction not classified. The calculations are based on the following formula which is based on the works of Balassa, (1965), and Donges and Riedel (1977).

$$(RCA)_i = \sum_j \left[\left(\frac{x_{ij} - m_{ij}}{x_{ij} + m_{ij}} \div \frac{\sum_i x_{ij} - \sum_i m_{ij}}{\sum_i x_{ij} + \sum_i m_{ij}} \right) - 1 \right] \cdot \frac{x_{ij} + m_{ij}}{\sum_j (x_{ij} + m_{ij})} \qquad \ldots (6)$$

with the expression within brackets times +1 for $\sum_i x_{ij} - \sum m_{ij} > 0$ and -1 for $\sum_i x_{ij} - \sum x_{ij} < 0$ and i = o ... 9 and j = 1,2. Exports is represented by x, imports by m, SITC commodity group by i, and country by J. Where, SITC exports and imports to and from India and other countries are considered.

It is assumed that a country's exports denote industries which exhibit comparative competitiveness, and the country's imports specify uncompetitive industries. A coefficient value greater than zero implies that the commodity group has a comparative advantage; comparative disadvantage occurs for values less than zero.

Coefficients of RCA based on equation (6) have been computed for the Fifth, Sixth, and the Seventh Five Year Plans, (Table 2) and the results are disclosed in Table 3.

However, in calculation of RCA through this method, three limitations could be pointed out in this regard. First, RCA indices depict the trade patterns that have taken place, but cannot confirm whether these are optimum patterns. Second, export prices are assumed to be the same to all markets of destination. Third, RCA indices are sensitive to the choice of years and level of aggregation. There cold be some distortions while computing RCA according to SITC category for Nepal due to these problems. The results demonstrate that Nepal had comparative disadvantage in all the SITC commodity groups during the three plans under comparison. However, the comparative disadvantage has been the least during the Seventh Five Year Plan for SITC groups 5, 6, 8, and 9.

Nepal cannot exploit its comparative advantage in the world market through specialization unless its enterprises are able to compete with foreign producers on equal terms and conditions. As such, domestic firms must function in a neutral environment where prices operate in undistorted fashion. Specifically, domestic firms require a realistic exchange rate, free trade with respect to inputs and outputs, competitive financial and primary input markets, and non-discriminatory domestic taxes.

CONCLUSION

Earlier, agricultural products were the major commodities being exported to India. However, exports of such commodities have been fluctuating while imports from India are on the rise.

Because of favourable external market conditions, especially of USA and Germany, a few exportable commodities such as readymade garments and carpets have cropped up and their contributions to export trade have been quite remarkable. Though the external market conditions were predominant, the significance of internal factors, both spontaneous ad policy-induced, cannot be minimized.

Hence, the government should attempt to cut back its reliance on a narrow range of agricultural exports to India and only readymade garments and carpets to overseas countries by identifying the supply-side variables.

The country's trade strategy should stress on specialization based on comparative advantage, rather than on a simple effort to increase foreign exchange earnings via higher exports. the export policy complementing such a strategy should focus on removing the disadvantages domestic firms encounter vis-a-vis foreign competitors in world markets.

Table 1
Variables Computed in Index Form

Year	X	M	C	G
1980/81	124.1	25.9	33.6	83.6
1981/82	115.0	29.3	27.4	85.0
1982/83	87.3	57.2	60.6	165.0
1983/84	131.4	55.8	68.2	161.4
1984/85	211.3	74.0	100.9	167.1
1985/86	237.4	89.8	96.6	215.0
1986/87	230.7	108.3	88.5	220.0
1987/88	319.6	157.0	109.1	269.3
1988/89	323.5	231.4	114.8	339.3
1889/90	397.6	331.8	116.3	380.0
1990/91	586.3	308.5	113.2	374.3

Source: Author's computations.

Table 2
Commodity Trade During The Fifth Sixth and Seventh Five Year Plans

(in million Rs.)

SITC Group	Exports to India	Imports from India	Exports to Other Countries	Imports From Other Countries
Fifth Plan				
0	1908.9	1378.2	695.1	190.2
1	7.7	133.9	36.0	34.4
2	1251.0	223.2	754.5	117.2
3	2.9	358.9	0.8	994.3
4	48.7	70.7	1.2	24.2
5	20.3	851.1	5.4	512.6
6	64.5	2678.8	808.3	1521.6
7	8.3	1090.4	5.7	1480.0
8	17.1	624.5	191.3	454.1
9	12.0	63.1	3.3	26.7
Sixth Plan				
0	2774.3	2714.1	454.2	942.2
1	23.6	246.0	33.8	28.0
2	1611.0	592.4	543.7	536.9
3	6.1	413.0	0.5	3145.5
4	246.3	170.6	2.4	253.7
5	4.6	1915.1	10.2	1463.8
6	814.9	4367.4	1252.8	4562.1
7	69.0	2534.1	8.2	3664.1
8	39.3	942.2	777.5	1397.0
9	3.5	17.8	1.1	21.8
Seventh Plan				
0	2753.6	4726.2	783.6	1737.4
1	7.1	805.9	17.4	46.9
2	1611.0	539.5	295.2	4301.4
3	1.2	560.5	0.0	5105.0
4	382.6	31.4	87.7	1418.1
5	29.8	3624.9	24.2	4684.6
6	857.6	6469.7	7329.2	12611.8
7	42.7	3781.9	4.9	13917.8
8	60.3	1190.3	5244.4	3124.4
9	3.0	11.5	0.0	14.7

Sources: 1. Nepal Rastra Bank .
2. Trade Promotion Centre.

Table 3
RCA Coefficients

SITC Group	Fifth Plan	Sixth Plan	Seventh Plan
0	-0.33	-1.08	-1.51
1	-2.54	-2.55	-2.63
2	0.89	-0.27	-1.81
3	-3.70	-2.57	-2.82
4	-1.84	-1.29	-1.95
5	-3.57	-2.95	-2.76
6	-2.74	-2.20	-1.71
7	-3.67	-2.78	-2.80
8	-2.80	-1.96	-1.20
9	-2.89	-2.45	-2.42

Source: Author's computations.

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BOOK REVIEW

Upadhyaya, M.P. (1993). Optimizations and Linear Programming, B.A/B.Sc., Pawan Poudel, Kathmandu, PP. 232, Price NRs. 80.00.

Mathematics has been considered as one of the essential apparatus to evaluate and analyses other branches of discipline. Optimizations are the fundamental analytical tools in the field of business and economics. From the early 19th century the mathematical analysis is widely used in the field of economics. Therefore, some parts of mathematics has been taught as a compulsory subject in the curriculum of Tribhuvan University for studying business, economics and science.

The present book which is under review could be considered as one of the pioneer of its kind in this field. The book is divided into six chapters and the first chapter includes optimizations. In this chapter the author attempts to define clearly the concepts and the working rule. But he has not made any attempt to review the differential calculus, which is the main basic tool to evaluate minimisation and maximisation functions.

In chapter second, third and fourth, the author has evaluated the linear programming. In these chapters he has given clear idea of the definitions and concepts of LPP and has also attempted to formulate LPP trying to define vectors and convex set in brief. It includes graphical solution, simplex method, duality and its related theorems and the transportation problem of LPP. But to make simple and understandable to the common readers, it is necessary to introduce the Gusian method of finding inverse when dealing with the simplex method of LPP. Similarly, it is difficult to formulate the LPP rather than to obtain a solution. The author has provided some simple example for the formulation of the LPP. If he would have considered some example from the case study, it would have been certainly more useful to the students of science, commerce and economics.

The fifth and sixth chapters deals with the game theory and difference equation. The methods of solving game theory problems and rules of difference equations are clearly dealt. But it is necessary to evaluate some rules of trigonometric functions and their differentiation which is needed to solve the problems in order to evaluate complex root case. But the author has not attempted to deal with such essential tools.

This book is undoubtedly, useful for the students of science, economics and commerce. The author however, should make an effort to define and review the basic mathematics such as important trigonometric functions, differential calculas, matrix algebra etc., in the forthcoming edition.

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