

Chapter I

INTRODUCTION

The purpose of this study is two-fold: (1) to study the natural resource content of India's foreign trade and (2) to test empirically the factor structure of India's foreign trade by taking into account not only the capital and labour requirements but also the natural resources, the skill content and the Research and Development (R and D) activities. The selection of this topic for our dissertation reflects the resurgent interest in the pure theory of International trade.

There has been an increasing awareness in the past two centuries in the belief that natural resources are the foundation of the material prosperity of a nation. Malthus, Ricardo and John Stuart Mill were the pioneers in giving an influential expression to this fundamental fact. They predicted that scarcity of Natural Resources would ultimately lead to diminishing social returns to economic effort and thereby retardation and arrest of economic growth. The conservation movement in the United States in the beginning of this century was in response to the growing concern over natural resource-scarcity and to the belief that social welfare over time depended on the extent to which men conserved and managed natural resources.

In the postwar years, the President's Material Policy Commission¹ (popularly known as Paley Commission) and A Task-force of the Bipartisan Commission on organization of the Executive Branch of the Government,² both set up in the United States, noted how crucial are the natural resources for the nation's future and recommended for the unification of the responsibilities and services of the Government dealing with such matters. The voluminous report of Paley Commission opened with a statement "even a casual assessment would show many causes for concern."

In spite of the fact that natural resources are very important for national well being and the fact that our national economy depends on a variety of natural resources, in India, the literature dealing with resources and its efficient utilization has been extremely scanty. It is much less when we take the specific question of foreign trade in natural resources. Bharadwaj, in a pioneering attempt³ to study the factor structure of India's foreign trade, computed the capital and labour content but then omitted the natural resource factor. Recently,

¹President's Materials Policy Commission: Foundations for Growth and Security. Resources for Freedom. Vol. I, Washington: GPO., 1952.

²Commission on Organization of the Executive Branch of the Government, Report on Natural Resources. Washington: GPO., 1949.

³Bharadwaj, R. Structural Basis of India's Foreign Trade. Bombay University, 1962.

Mr. Prasad, in an unpublished doctoral dissertation⁴, touched upon this issue by computing the natural resource content of India's foreign trade between 1921-22 and 1955-56. While Prasad's study of natural resource content of India's foreign trade is based purely on Drain theory, the matters regarding the identification of forces at work which have influenced the natural resource content of India's foreign trade and their intensity have remained untouched. It is hoped that this dissertation, a major proportion of which is an empirical analysis of India's foreign trade, will fill this gap and be a useful addition to the relatively small amount of existing empirical work in this field. The study covers the period of last twenty years beginning from 1948-49 to 1967-68. The year 1948-49 has been chosen as a matter of convenience as the partition of the country in August 1947 makes the search for accurate and comparable data for previous years extremely hazardous.

It is also the aim of this study to test the celebrated Heckscher-Ohlin theory which did create a lot of sensation among economists just two decades ago because of the paradoxical results that Leontief obtained when he applied the theory to the American trade structure. Further theoretical research in

⁴Prasad, K.N.: Factor Contents of India's Foreign Trade during 1921-22 to 1955-56 and Price Movements of Traded Commodities together with their Hicks-Leontief Aggregation. Unpublished doctoral dissertation submitted to Poona University. 1968.

the pure theory of International trade has arrived at the conclusion that the traditional approach to the theory in terms of two factor (capital and labour) analysis is weak in predicting the trade pattern of a country and what is more suitable is a multifactor analysis. Evidence gathered from the application of the Indian trade data in the light of recent empirical evidence in the United States, tend to support this multifactor hypothesis.

Definition of Natural Resources and its Measurement:

Before we embark upon the study of natural resource content and the factor structure of India's foreign trade, our first task is to arrive at some agreed definition of the term "Natural Resources". The term natural resources can be used either in a wide or in a narrow sense. In its narrow sense, the term consists of the Richardian "original and indistructible" land. In the wider sense the term may consist of everything, even steel industry, chemical industry, colleges, universities etc.. Clearly all cannot be included as resources and there must be some vigorous exclusion in order to focus attention on a managable bundle of ideas.

Even if we accept the narrow definition, it must be admitted that it is impossible to measure natural resources in economic terms. Clearly acreage will not be a sufficient measure, given the differences between arable, pasture, wooded

and wasteland. Even with arable land, one has to account for differences between plains, rich bottom fields along the rivers, terraced mountain sides, drylands and those with abundant rainfall. There is more diversity in natural resources outside of agriculture and forestry: water power sites, mineral deposits, natural harbours etc. In the absence of a standard measure, therefore, one cannot state with certainty that India has more natural resources than say the United States of America.

Further, resources always refer in relation to a given technology. When the technology changes by innovation, the economic characteristics of a given resource may also change. Thus new techniques in drilling may extend natural resources of oil and gas into the sea. Similarly new refining methods, new seeds etc., will also change the resource base of a country.

Yet another difficulty in regard to natural resources is that frequently resources cannot be separated from other factors, especially from capital. For instance, out of two pieces of land of the same size and physical characteristics, one piece which was formerly a part of an open plain is a natural resource and the other piece which has been cleared of trees is partly capital. If the discovery of a mine is just accidental, then land is land. But if a mineral wealth is acquired through expensive exploration then it may be regarded mainly as capital.

From the theoretical point of view, economic rent may be the most ideal index to measure the contribution of land factor, but statistically this is not practicable as the present state of affairs regarding statistical information do not permit for such a study. The imputation method will prove to be an extremely hazardous task.

Confronted with all these difficulties, both theoretical and statistical, our choice was to follow Vanek's⁵ model in which the value of resource products is taken for resource content. Resource products are defined as the products of those commodities which are nearest to the initial stages of production or require simple processing.⁶ In all such commodities land is used as an "active input" and its function is more than just the supplying of space for production. Thus products of agriculture, forestry, fishery and mining will be treated here as resource products⁷ (and thereby their value as resource content) rather than manufacturing and transportation. This method has various limitations, but it is the nearest approximation to truth.

⁵Jaroslav Vanek. The Natural Resource Content of United States Foreign Trade, 1870-1955. M.I.T. Press, 1963. pp.1-11.

⁶Thus wheat or oilseeds are resource products but not wheat flour or vegetable oil since the latter two do not use land as a direct input.

⁷The actual definition of these sectors is somewhat arbitrary since in certain cases it is difficult to draw a ~~perfect~~ line between active and non-active inputs of land.

There are two general considerations that have to be taken into account when we use the value of resource products for natural resource content. First, the share of land input is not likely to be constant in different resource products and the same resource product cultivated on a Ricardian marginal land and other fertile lands.⁸ The value of oil or iron ore in its natural form may be quite small compared with that of labour and capital used in its extraction. However, there is a great possibility that land has to do something more with these commodities than with those of highly processed and fabricated commodities like machinery, transport-equipment etc.

Second, the resource content itself might change over time due to changes in factor prices and technology. Hence it might be questioned whether a change in the share of resource products in total trade will not alter the resource content of trade. Though this is true, this is a rare possibility since all inventions or innovations are not likely to create the same type of effects. While some products may be subject to landsaving innovation, others may be land absorbing one. In the aggregates (most of our analysis deals with large aggregates of commodities), thus, one type of effect is likely to be offset by an opposite effect. Hence it is safe to assume that the approximate proportionality between the value of resource

⁸Vanek. Op.Cit., p. 37. Vanek quotes Schultz study and claims that the proportion of resource input in farming production has remained fairly constant over the past fifty years. However, there are no such studies for India to verify this.

products traded and the value of land input of trade would remain relatively unaltered under conditions of changing technology.⁹

Statistical Sources:

For our empirical work we were compelled to refer to various publications for collecting the statistical data on India's foreign trade as different publications provided statistics of landborne trade and sea and airborne trade of India. Moreover, the same publication has sometimes undergone changes in its title and scope.

(1) Landborne trade: So far as this part is concerned, we have tried to include only the landborne trade with Pakistan, Afghanistan, Iran and Burma. No attempt, however, has been made to include the landborne trade with Nepal,¹⁰ Tibet, Sikkim and Bhutan as these figures are available only in terms of quantity.

The main sources of reference for landborne trade were:

- (i) Indian Trade Journal.
- (ii) Statistical Abstract of India.
- (iii) Annual Statement of Foreign Trade of India for the Financial years 1952-53 to 1955-56 and Nine Months ended December 1956.
Vol. I. Part B.

⁹Vanek. Op.Cit., p. 38.

¹⁰The landborne trade is merged with sea and airborne trade since January 1957. Therefore this problem was there only for the years 1948-49 to December 1956.

(2) Sea and airborne trade: The sources of reference were:

- (i) Trade statistics relating to Maritime States of Kathiawar and the State of Travancore. (for the year 1948-49)
- (ii) India's foreign trade statistics: Kishor Thanawala.
- (iii) Annual Statement of the Sea and Airborne trade of India for the Five Financial years ending March 1952.
- (iv) Annual Statement of Foreign Trade of India for the four financial years ending March 1956 and nine months ended December 1956.
- (v) Monthly statistics of the foreign trade of India (for the rest of the years.)

Limitations of India's Foreign Trade Statistics:

A basic limitation of India's foreign trade statistics is that it lacks comparability. This is introduced into our foreign trade statistics by the varying changes. These changes fall broadly in three parts: (A) those relating to territorial coverage; (B) those relating to commodity classification; (C) those relating to the period of recording our foreign trade statistics.

Under (A), the following problems may be listed:

- (1) The foreign seaborne trade of Kutch has been included for the first time with effect from 1st June 1948.
- (2) The foreign seaborne trade of Saurashtra, Okha (Baroda) and Travancore has been included with effect from 1st April 1949.
- (3) The foreign airborne trade registered at Delhi airports has also been included from April 1950.
- (4) India's foreign trade with overseas countries in transit through the foreign possessions on the Indian coast have been included with effect from April 1951.

- (5) The landborne trade of India with Pakistan, Afghanistan, Burma, and Iran are merged with air and seaborne trade of India with effect from 1st January 1957.
- (6) After the integration of Goa, Daman and Diu with Indian Union in December 1961, the trade arising from there, was published in Portuguese language in a separate publication by the Government of Goa, Daman and Diu till March 1962. From April 1962 to March 1963 the relevant statistics were published in the monthly statistics of foreign trade of India separately because of the differences in trade classification. From April 1963, it is combined with other trade statistics.
- (7) With effect from April 1963, trade arising in the Andaman and Nicobar islands and the Lakadive, Minicoy and Amindivi islands is included.
- (8) With effect from March 1964 both land and air-borne trade with Nepal is included with other trade statistics. Previous to that, the land-borne trade with Nepal was excluded since only quantity figures arising from the rail movements in the adjacent railway stations bordering this country were used to be recorded.

Under (B) come:

- (1) With effect from January 1957, the old trade classification is replaced by Indian trade classification based on Standard International Trade Classification (SITC). The new classification is more detailed and provides scope for separate

specification of 4850 commodities as against 1700 commodities in the old classification. The landborne trade of India with her neighbouring countries, which was recorded separately till January 1957, was recorded in less detail compared to old classification.

- (2) The new classification of 1957 is further revised on the basis of SITC - Revised, with effect from April 1965.

The main problem under (C) is the change in the recording of our foreign trade statistics from financial year basis to calendar year basis between 1957 and 1960 and again shifting to financial year with effect from 1961-62.

Solutions:

Let us now see how these problems were tackled for the purpose of this study. We could not make adjustments regarding problems A (1), A (3), A (4), A (6), A (7) and A (8) due to lack of published data. Regarding A (2), we have included the statistics relating to the trade of Saurashtra and Travancore for the year 1948-49 by taking the relevant statistics from Trade Statistics Relating to Maritime States of Kathiawar and the State of Travancore. Regarding A (5), we have incorporated the trade statistics of landborne trade after consulting the following publications: (a) Indian Trade Journal (for years 1948-49 and 1949-50). (b) Statistical Abstract of India (for the years 1950-51 and 1951-52). (c) Annual Statement of

Foreign Trade of India (for the Financial years 1952-53 to 1955-56). Here again we came across the difficulty of different trade classification followed for landborne trade.

Regarding problem B (1), we relied on Kishor Thanawala's Book on India's Foreign Trade Statistics¹¹ which has regrouped the old trade classification according to the new classification adopted in January 1957. Regarding problem B (2), we regrouped the revised classification of 1965 according to the 1957 classification using the Alphabetical Index¹² to Indian Trade Classification (ITC).

The problem (C) has been solved by converting all calendar years to financial years by taking the quarterly figures.

Scheme of the Work:

This study is divided into seven chapters. The first two chapters build the basic theoretical framework. We start, in Chapter II, with the Heckscher-Ohlin theorem as this is the hypothesis which is tested later. There follows the theoretical proof for the two major propositions of the Heckscher-Ohlin theory: (i) under identical production conditions all over the world, a country exports those

¹¹Kishore Thanawala. Statistics relating to India's foreign trade, 1948-49 to 1959-60. Popular Prakashan, 1967. *64 pages.*

¹²Department of Commercial Intelligence and Statistics, Government of India: Alphabetical Index to the Indian Trade Classification. 1956.

commodities which use more of her abundant factor and imports those which use more of her scarce factor, (ii) the effect of free international trade on factor prices is towards full factor-price equalization.

The pioneering attempt made by Professor Leontief to test the Heckscher-Ohlin theory using the American trade structure is discussed in Chapter III. His paradoxical conclusions initiated alternative explanations to the paradox. A brief review of these explanations is made in this chapter.

Chapters IV, V and VI constitute the empirical work of this dissertation. In Chapter IV, we have discussed the direct resource requirements of India's foreign trade. The issues examined in this chapter are: (a) the share of resource products in our exports and imports, (b) the impact of changes in unit prices on their changing share, (c) the impact of demand and supply forces on the changing conditions in the markets of resource products, (d) the relative resource requirements of India's foreign trade and (e) the regional patterns of demand and supply for India's resource products.

In Chapter V, we have taken both the direct and indirect resource requirements. The total resource requirements are broken down into renewable and non-renewable resources and we have examined their impacts separately.

The empirical test of the Heckscher-Ohlin theorem by using the Indian trade data is presented in Chapter VI. Here,

apart from computing the labour, capital and resource content in exports versus competitive imports, we have also computed the skillwise composition of labour force and the role of Research and Development (R and D) activities.

We have summarised all our findings from this study in the final chapter.

.