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PREFACE

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Cornelis van Bochove

1. INTRODUCTION

The pure theory of international trade is afflicted with an archaic view of national economies and their interrelations. A national economy is conceived as an independent and basically self-sufficient unit. It can choose freely between producing in perfect autarky or obtaining a modest gain by specializing in some products and exporting these in exchange for other goods it previously made at home. All imported goods can be perfectly produced domestically and there are no adjustment costs involved in replacing imports by such domestic produce. Usually trade is thought to consist of finished goods, with intermediates and raw materials playing only a marginal role. The consequence of this prevailing view of a semi-autarkic state is that the long-run growth rate of national income is thought to be independent of trade: at best trade can only temporarily affect growth.

This conception may have been adequate in the eighteenth century, and possibly in the early nineteenth century. As Kuznets (1967, p.25) puts it: 'In a pre-industrial economy a large part of the national product is consumed within the producer's household, and the proportion of complicated products assembled from many fabricated parts is relatively small'. Consequently the role of trade in the production process is minor. This finds expression in a low proportion of trade to income: around 1700 circa 7% for England; circa 3% for the world as a whole in 1800 (Kuznets, 1967, pp. 96 and 7 respectively). Accordingly, when the classical theory of international trade emerged early in the nineteenth century, its view of trade may have been realistic.

The neoclassical and the modern theory, developed in the mid-twentieth century, use different production functions and demand specification but still have the same basic view of trade as the classical theory: trade is a luxury that can, at some cost, be dispensed with. However, extent and nature of international trade have changed considerably since the late eighteenth century. By 1913 the proportion of world trade to world income had risen to 33% 'and major channels of flow and interdependence were established in what was previously a congeries of relatively isolated economic societies' (Kuznets, 1967, p.7). Of course two world wars and the depression of the thirties lowered the proportion of trade to income but

the growth of recent decades has raised it again to its 1913 level. Most of these sizeable imports must be considered as 'indispensable' in the sense that there are no perfect domestic substitutes for them or that sizeable adjustment costs permanently prevent the production of perfect substitutes. There are various reasons for this. First, a large part of the imports of primary products is based on specific factors that a country lacks. In chapter 3 we shall show that 70% of the primary product imports of the U.S.A., Germany, Japan and The Netherlands is generated by lack of such specific factors; this amounts to one third of these countries' total imports. Second, technological know-how plays a similar role as a specific factor: the general level of skills in a country determines what products it cannot produce at home but must import from abroad. In addition even technologically advanced countries usually lack specific know-how in individual products; this is caused, for example, by a failure to produce some product in the early stages of its development whereas catching up with the leaders was prevented by the latter's advantages due to economies of scale and learning by doing. A third reason for 'indispensability' of imports is adjustment costs. Even if a country would eventually have a comparative advantage for a product it currently imports, it must pass through a period with high adjustment costs to make the product domestically; the discounted gain caused by the eventual comparative advantage may well be insufficient to offset these costs of adjustment.

Not only has trade grown tremendously and become 'indispensable', but its composition is also quite different from that envisaged by most of the pure theory. In 1974 the share of industrial inputs and fuels in total imports was roughly two-thirds, both in developed and less-developed countries. That of consumer goods, the central concern of the main body of trade theory, was only one-fifth for developed countries and an even more modest one-ninth for developing countries.

This state of things implies that the view of national economies as isolated production processes that trade some of their final outputs with one another, but could basically do without trade, is outdated. Countries cannot possibly hope to produce perfect domestic substitutes for all their imports, whether final good, intermediate, or raw material. Products are frequently hauled several times back and forth across borders, in several stages of completion, before becoming a finished good somewhere. Moreover,

even imported finished goods require further processing: assembling, transportation and marketing (including distribution). Each economy is, at every level of its industries, inextricably linked up with other economies so that an almost indecomposable international production system has evolved.

In recent years there have been a number of contributions to the literature that explicitly consider trade in produced means of production. Some of these, following Oniki and Uzawa (1965), generalize the Heckscher-Ohlin-Samuelson framework and add capital accumulation if growth is to be analysed. Others, notably Steedman (1979a, b), utilize a neo-Ricardian approach: fixed coefficients under a steady-state assumption. However, all assume that perfect domestic substitutes exist for the imports and that resources can be shifted to the sectors producing import substitutes without any adjustment costs. This implies perfect homogeneity of capital and labour in addition to absence of non-traded specific factors, innovation, economies of scale, learning. Very little work has been done on the consequence of trade in produced means of production for which no perfect domestic substitutes exist, for growth and the long-run growth rate. This is a serious deficiency: if national economies are not self-contained production systems, but merely parts of an integrated international process, it hardly makes good sense to analyse the growth of such a part as if it were a complete system in itself. Thus the theory of economic growth, developed for closed economies, is unlikely to be applicable to most modern countries. Therefore the purpose of the present study is to analyse the economic growth of nations and groups of nations whose production process is inextricably interwoven with that of other nations. More concretely, our aim is to investigate the consequences for economic growth of the large-scale trade in indispensable inputs that characterizes the modern world economy; in particular we concentrate on the rate of growth of national income.

Section 1.1 of this introduction describes our approach; section 1.2 gives the plan of the book and summarizes our results.

1.1. Approach

We capture the two central characteristics of modern trade, viz. most imports' being 'indispensable' and the preponderance of intermediates in

world trade, by considering all imports as an input in the national production function for which no perfect domestic substitutes exist. This approach provides a better approximation of modern trade than traditional theories; in addition it has two major practical advantages.

First, it allows for a one-sector analysis. This greatly simplifies the theoretical analysis of growth and avoids the complications of describing the composition of final demand and output. This has the advantage of highlighting the dependence of growth on aggregate trade without sidetracking the train of thoughts to subtle issues of sectoral shares and patterns of specialization. An added benefit is that the analysis now becomes sufficiently transparent to handle other interesting complications. Specifically, we consider Hicks-neutral technical progress and increasing returns.

The second practical advantage is that empirical implementation of the models obtained is fairly easy. The major problem in estimating a traditional trade model, in which imports are delivered directly to final demand and compete with perfect homemade substitutes, is to obtain a correspondence in the commodity breakdown of the statistics of trade, consumption and production. This is especially prohibitive at the most aggregate level, viz. the two-sector model, where exportables should be distinguished from importables in production and consumption statistics - a virtually impossible job. This problem is avoided if the fact is recognized that in general no perfect domestic substitutes for imports exist. If, in addition, all imports are treated as inputs, one has only a single production function to estimate instead of both demand equations for imports and domestic produce - derived from a community indifference curve - and a production function for the latter. Moreover, in the case of disaggregate analysis the differences between various categories of imports and outputs can be handled by allowing for additional inputs and several outputs in a joint production process.

Actually, there already are a number of empirical studies that treat all imports as a factor of production (cf. section 3.2). We shall not contribute to this body of empirical knowledge but instead make a start in developing the theoretical implications for economic growth. Nevertheless it is important to keep an eye on the possibilities for empirical implementation and practical applicability.

To treat imports as an 'indispensable' factor of production in growth