

**IMPLICATIONS OF NEW TRADE AND  
ENDOGENOUS GROWTH THEORIES  
FOR DIVERSIFICATION POLICIES OF  
COMMODITY-DEPENDENT COUNTRIES**

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## CONTENTS

Chapter	Page
INTRODUCTION	
I. TRADE THEORY AND STRUCTURAL DIVERSIFICATION	3
II. NEOCLASSICAL AND ENDOGENOUS GROWTH THEORY	6
A. Neoclassical growth theory in the Solow tradition	6
B. Endogenous growth theory	7
III. IMPLICATIONS FOR THE EVOLUTION OF COMPARATIVE ADVANTAGE	11
A. The flow of capital from developed to developing countries	11
B. The interplay of economies of scale, externalities and national or international spillovers of knowledge and technology	12
C. Policy implications	16
1. Industrial-policy type interventions	16
2. Indigenous research and development activities	19
3. The accumulation of human capital	20
IV. MARKETING ASPECTS AND DIVERSIFICATION	24
V. CONCLUSIONS	26
ANNEX: Knowledge accumulation, market failures and government intervention	28
REFERENCES	30

# IMPLICATIONS OF NEW TRADE AND ENDOGENOUS GROWTH THEORIES FOR DIVERSIFICATION POLICIES OF COMMODITY-DEPENDENT COUNTRIES

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*New trade and endogenous growth theories are discussed, and their findings taken to interpret technological innovation and human-capital accumulation as being the engines of structural diversification. Structural diversification is seen as being the result of dynamic learning sequences, where introducing new technology provides learning-by-doing benefits which, however, peter out once activities associated with the new technology have been repeated many times; new and more sophisticated technology is needed to continue reaping learning effects. Diversification policy should encourage skill-upgrading, for example by refocusing education policy and fostering the production of products that are one step higher on the skill ladder than those presently produced, independently of whether those products are considered commodities or manufactures in common product classifications. Associated policy actions for technology development and human capital accumulation are outlined.*

## INTRODUCTION

Both the economic policy adopted by many developing countries to foster growth and comparative advantage in international trade and the findings of economic theory regarding the role of government in this process have undergone substantial change over the last few years. Many developing countries have adopted an economic policy stance that emphasizes the importance of liberalization and "getting the prices right" for the attainment of overall economic efficiency. By contrast, findings of new trade theory have led some economists to raise questions such as "is free trade *passé*?", while endogenous growth theory has shown that economic policy in general, and under certain conditions specific support to selected economic sectors, can raise the rate of growth.

A basic contribution of new trade and endogenous growth theory has been to allow for the formal modelling of divergences from standard neoclassical assumptions, for example that technological change is exogenous (a function of elapsed calendar time), that the same technological opportunities are freely available and can be used efficiently in all countries of the world, and that firms operate in an environment of perfect competition. Economists working with such models have thus succeeded in incorporating into "formal theory" elements of what has long been emphasized by development economists doing "appreciative theory" - to follow the terminology of Nelson and Winter (1982) - namely, the consideration that technological change has to be "analysed as the joint outcome of innovation and learning activities within organizations, especially firms, and interaction between these and their environments" (Fagerberg, 1994, p. 1156).

According to both strands of theory, the persistent poverty and low degree of diversification in developing countries can partly be explained by differences in technology. However, traditional neoclassical theory considers such technological differences as gaps in the endowment of objects, such as factories or roads; diversification policy should therefore concentrate on promoting physical investment. By contrast, appreciative theory considers poverty and dependence as gaps in the endowments of ideas and of the limited capability of developing countries to absorb new knowledge. Diversification policy should therefore concentrate on the interaction between technology and skills with a view to facilitating the reduction of the idea gap. Achieving structural diversification, and hence moving comparative advantage more and more towards products based on skill-intensive technology, depends on a country's relative endowment with skilled labour, which may be altered by policy. Recent literature also discusses the interdependence of economies which undergo structural change and engage in international trade and capital movements, as well as the role of direct and indirect learning at the national and international levels in this process. In recognizing that ideas are of central importance in growth and development (Romer, 1993), recent work on trade and economic growth has moved formal economic theory part way toward the position advocated by appreciative economists and made those positions more explicit and precise as to how each component of the whole system works.

In common language, diversification refers to the expansion of the range of goods made and sold in order to reduce any commercial risk which would result from relying on sales of one, or a few, goods only. However, producing and exporting a wider range of goods would, at first, appear to contradict the fact that the basis of all trade is specialization, which implies producing and exporting a narrower range of goods. It thus seems clear that diversification, though it might be defensible in special cases as a way of reducing risk, is not a sensible general development strategy in a world which offers the possibility of trade. And yet, that is what often has been advocated. As a matter of fact, one might expect the secular process of product upgrading or structural diversification to involve an initial rise in the number of goods, followed by a levelling out approaching a steady state in which the number of new products introduced in each period is largely offset by the number of old products dropped; the number of goods produced and exported will fluctuate within a narrow band. However, even in the initial stage, the important factor for growth and development is the efficient use of more advanced technology leading to product upgrading, rather than the rise in the number of goods as such. In addition, product upgrading continues apace in the steady state, even though the rise in the number of goods produced and exported has ceased.<sup>1</sup>

The objective of this paper is to discuss the recent theories on trade and economic growth as they apply to structural diversification in developing countries with a view to conceptualizing for diversification the issues raised in these contributions and highlighting their policy implications. The focus of attention will centre on the interrelationship between structural changes in developing

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<sup>1</sup> See Mayer (1996a) for a more detailed discussion of the concept of diversification.

countries' exports, learning and technical progress.<sup>2</sup>

The structure of the paper is as follows: chapters I and II review the main theoretical approaches and findings of recently developed trade and growth models. This is followed in chapter III by an application of these theories to the evolution of comparative advantage and diversification potentials in developing countries, highlighting their implications for diversification policies. Chapter IV briefly discusses marketing aspects related to diversification, an issue which has not been tackled in either new trade or endogenous growth theory. Chapter V summarizes the main conclusions.

## I. TRADE THEORY AND STRUCTURAL DIVERSIFICATION

The fact that some economic sectors generate positive externalities and that these externalities may not spread rapidly around the globe can act as a constraint to structural diversification since they cause technological disparities to persist.<sup>3</sup> The traditional interpretation of comparative advantage is based on the assumption of constant returns to scale, i.e. assuming that when inputs to production are doubled output doubles as well. In the presence of economies of scale, the larger the scale on which production takes place, the more efficient is production - i.e. doubling the inputs to production will more than double its output. Economies of scale at the firm level - internal economies of scale - must be distinguished from those occurring at the sectoral level - external economies of scale or external economies - in order to analyse their impact on market structure and structural diversification. "*External economies of scale* occur when the cost per unit depends on the size of the ... [sector] but not necessarily on the size of any one firm. *Internal economies of scale* occur when the cost per unit depends on the size of an individual firm but not necessarily on that of the [sector]" (Krugman and Obstfeld, 1994, p. 115; emphasis in original). Internal economies of scale allow large firms to obtain a cost advantage over small ones and are therefore likely to give rise to an imperfectly competitive market structure. By contrast, external economies of scale need not lead to imperfect competition because individual firms may remain small, even though important advantages for the large scale arise at the sectoral level.

The limited size of a market constrains both the variety and quantity of goods that a country can produce efficiently when there are *internal* economies of scale. Firms operating on a relatively large domestic market will tend to have more sales and hence lower average unit costs than those

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<sup>2</sup> A great variety of other factors (such as macroeconomic and trade policies, the availability of financial resources for investment, physical infrastructure, resource endowments, market access conditions, etc.) impact on structural diversification. However, these factors will not be addressed here in order to concentrate on the implications of learning and innovation for diversification. UNCTAD (1995a) discusses issues related to ready market access, while Mayer (1996b) analyses the impact of resource endowments and trade policy.

<sup>3</sup> Another such mechanism regards the fixed-cost expenditure associated with bringing new kinds of activities or goods into existence. This mechanism will be discussed below.

operating on a small domestic market. Given their cost advantages, these firms will be more competitive on international markets and therefore find it easier to establish export activities. This suggests that countries with a relatively large domestic market will find it easier to diversify into activities where internal economies of scale are large.

Economies of scale arise at the sectoral rather than at the firm level, for example when production is concentrated in one or a few locations, thereby reducing the sector's cost without necessarily affecting the size of individual firms in this sector. The geographical concentration of production sites may give rise to a local market for a greater variety of support services (e.g. packaging, transportation, banking services) or for a larger supply of specialized skilled labour. The presence of strong external economies of scale tends to lead to a situation where a country that has established a large production of a good will produce it at a low cost, since its producers are able to take advantage, for example, of the easy and cheap availability of both support services and skilled labour. This cost advantage constitutes a barrier to entry for other countries to this sector even though the sector may have a perfectly competitive market structure; this is because the country that is trying to enter production in this sector will not have the gradual accumulation of networks of firms that gives rise to external economies, like the country with long established activities in this sector.<sup>4</sup>

The accumulation of knowledge is probably the main source of dynamic scale economies. Dynamic internal economies of scale arise when the costs of a firm depend on production experience, i.e. its cumulative output to date, rather than on the scale of its current output.<sup>5</sup> The inverse relationship between unit cost and cumulative output can be expressed through a downward-sloping learning curve. Dynamic external economies arise when the improvement which an individual firm achieved in its products or its production technique is imitated by its competitors; as a result, knowledge spills over from the firm that initially invested in knowledge accumulation to other firms that have not made any specific investment in such knowledge.

Whether or not externalities in this learning process spill over internationally has important implications for trade patterns. With a full international spillover of learning externalities, producers in all countries have access to the same body of technical information; as a result, the accumulation of knowledge through learning does not affect their relative abilities to produce any specific good. A country's trade pattern must then be determined by other factors, such as its initial conditions in terms of factor endowment. By contrast, if the extent of knowledge spillovers is limited to national borders, sector-specific knowledge stocks accumulate in proportion to local activity in this sector alone. Both domestic and foreign producers learn and become more productive in sectors in which

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<sup>4</sup> Examples of geographical concentrations of economic activities without obvious resource reasons include the ceramic tile agglomeration in Sassuolo (Italy), European carpet production in Flanders, or the production of watches in Switzerland.

<sup>5</sup> It is important to note this difference since arguments following the traditional interpretation of comparative advantage also sometimes invoke economies of scale, referring, however, to the current scale of output.

they always have been active; as a result, initial patterns of trade get locked in - history matters for the determination of a country's opportunities for structural diversification. The dismal conclusion would be that countries which, for whatever historic reasons, are late-comers in the process of structural diversification risk being trapped in a low-development equilibrium.<sup>6</sup>

To summarize, the argument that an initial advantage in structural diversification will perpetuate itself and serve as a barrier to competitive entrants is based on two assumptions: first, the learning-by-doing benefits of skill-intensive activities are assumed to accrue entirely to producers within a country, i.e. knowledge spillovers across national boundaries are assumed to be zero. Where knowledge spillovers are concentrated within national borders, countries' learning experience differ and the historical coincidence of inheriting even a small lead in knowledge puts a country in a position of self-perpetuating structural diversification and development, thereby increasing the gap in other countries. By contrast, where knowledge spillovers are international in scope, other countries can share in the benefits of knowledge accumulation and thereby improve their structural diversification and development opportunities, provided their social capability in knowledge absorption allows them to master this knowledge. Second, the argument of the perpetuation of an initial advantage in structural diversification is further based on the assumption that learning-by-doing is unbounded and that therefore producing different goods is associated with permanently differing learning potentials. The following chapter will show that this latter assumption may be unrealistic.

## II. NEOCLASSICAL AND ENDOGENOUS GROWTH THEORY<sup>1</sup>

### A. *Neoclassical growth theory in the Solow tradition*

The neoclassical growth theory in the Solow-tradition is based on the following production function:

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