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TRADE LIBERALIZATION AND INDUSTRIAL DEVELOPMENT: THEORY AND EVIDENCE FROM LATIN AMERICA

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TRADE LIBERALIZATION AND INDUSTRIAL DEVELOPMENT: THEORY AND EVIDENCE FROM LATIN AMERICA[1]

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ABSTRACT

This paper examines, first, the expected theoretical effects of trade liberalization on the efficiency of manufacturing industry. It concludes that positive static efficiency effects (X-efficiency and allocative efficiency) cannot be taken for granted but that allocative efficiency effects may be strong, in particular for small countries. Countries that do not have an industrial base yet will not experience dynamic efficiency effects, and there may be a trade-off between static and dynamic efficiency. In the second part, the available evidence for Latin America confirms many of the theoretical expectations. Particular attention is given to developments in manufactured exports.

1. INTRODUCTION

Trade liberalization was one of the sweeping reforms that came over Latin America in the past decade, in the aftermath of the debt crisis. It was often carried out in combination with policies to stabilize the economy in so-called structural adjustment programmes. The micro-economic reforms within these structural adjustment programmes seek to reduce government intervention in the economy and to liberalize markets.

The impact of structural adjustment programmes on manufacturing industry is a relatively neglected issue so far (see De Valk 1994, Lall 1995). One of the reasons for this is that manufacturing industry is a problematic sector for the adherents of structural adjustment. Manufacturing is considered to have been protected and subsidized too much. Structural adjustment ideally involves a more efficient allocation of resources, and this may lead to an increase or a decrease of the manufacturing sector.

Why should the impact of trade liberalization on manufacturing be of concern? If it follows from theory that trade liberalization enhances welfare, shouldn't we accept any outcome of the liberalization process, whether it means deindustrialization or not? This is a rather unsatisfactory answer (see also Weeks 1996). I am convinced that industry, and industrialization matters. There are two basic reasons for this. First, a country that does not develop industry is dependent on primary exports; most primary exports are subject to a long-run deterioration of the terms of trade. Secondly, compared to agricultural production the industrial sector creates more positive external effects such as technological spill-overs and economies of scale, which will lead to higher growth rates for the economy. If industry matters, then the question what the impact of trade liberalization on industry is, is relevant and legitimate. After all, trade liberalization does have an impact on industry.

The first part of this paper aims to unravel the theoretical effects of trade liberalization in the real world. I break down these effects into static and dynamic effects, and within the static effects I distinguish between X-efficiency and allocative efficiency. The analysis shows that the expected effects are different for large and small countries (see also Helleiner 1996).

In addition, for small countries with a small industrial base, trade-offs can be expected between static, allocative efficiency effects and long-run dynamic effects. I also show that the expected benefits are often based on the assumption that freeing markets (i.e. from government interference) is sufficient for establishing well functioning markets. In practice, markets are not perfect, in which case the expected benefits often do not come about. It is important to establish the conditions under which trade liberalization does increase welfare. If the conditions are not fulfilled, the policy conclusion can be to restrict trade, but the 'first best' solution may be to improve the conditions.

In the second part of the paper I define suitable indicators for the different concepts of efficiency and present some evidence on these indicators. An analysis of manufactured exports from Latin America confirms the importance of the size of the domestic market. Large and small Latin American countries proved to have had very different developments in their manufactured exports, and also in their skilled manufactured exports between 1970 and 1992. Although technically this was not a period of trade liberalization, it was a period of increasing world market integration for both small and large Latin American countries. From these results, some policy conclusions can be drawn.

Section 2 of this paper begins by defining trade liberalization. It then assesses the theoretical impact of trade liberalization on industry and specifies important conditions. In particular, expected differences between small and large countries are dealt with. Section 3 deals with the problem of establishing suitable indicators for assessing the impact of trade liberalization on industry. Possible indicators for evaluating static and dynamic efficiency are discussed. Section 4 examines the available evidence with respect to these indicators for Latin America, focussing, in particular, on countries with the longest experience with trade liberalizaiton for which case studies are available. Manufactured exports proved to be an important indicator for dynamic efficiency. Some data on manufactured exports, and on skilled manufactured exports in particular, are examined in section 5. Section 6 discusses the results and concludes.

2. THEORETICAL EFFECTS OF TRADE LIBERALIZATION

Ever since Ricardo the conventional economic wisdom holds that trade is beneficial to growth. Although one country may have a higher productivity in the production of all goods compared to another country, its relative productivities in producing different goods will differ. Trade is based on this relative (comparative) advantage and increases welfare in both countries. Within each country there will be winners and losers: the import competing sector(s) loses, and the consumers or importing sectors win. However, since the overall effect is positive, it is possible that winners compensate losers. At the time, this theory was a radical break with mercantilism which stated that welfare would only come from increased exports.

The supposed benefits of trade liberalization are based on these theoretical ideas on the benefits of free trade. I define trade liberalization as policies that diminish restrictions to the free international movement of goods and services. More in particular, it includes the diminishing of import quota and the lowering of import tariffs, and the diminishing of restrictions to exports and the lowering of export taxes. These policies will result in a decrease of the price of importables, and in an increase in the price of exportables. If markets work as they are expected to work, these measures lead to increases in imports and exports.

In practice, 'trade liberalization' often forms part of a structural adjustment programme. These programmes are about much more than (just) the micro-economic aim of freeing international markets. These other objectives include, for example, stabilization of the economy and promoting exports. The former may lead to an overvalued exchange rate. This means that the relative price of tradables is low, so both importables and exportables are relatively cheap, which provokes even more imports but hampers exports. Specific measures to stimulate exports tend to be taken in order to compensate the overvaluation of the currency or because they are aims in itself.[1] Typically, export promoting measures involve drawback schemes, export subsidies, tax exemptions for exports, etc. These measures usually are considered part of a trade liberalization programme in view of their intended effects. However, I do not subsume them under trade *liberalization* since they are not theoretically consistent with it.

Rodrik (1995) distinguishes four arguments in favour of trade liberalization. The first is a reduction in static inefficiencies. This is the familiar Ricardian argument for free trade. Secondly, there are dynamic effects: trade enhances technological change, learning and economic growth. Thirdly, economies with more trade adjust more easily to adverse external shocks, and fourthly, trade liberalization reduces waste stemming from rent-seeking activities. According to Rodrik, only the first of these arguments is firmly based in economic theory. He convincingly argues that the extent of rent-seeking is more likely to be a function of the hardness of the state than of the type of economic policies carried out. If firms can no longer look for rents in the area of import licences, they will fight for other rents. With respect to the ability to cope with external shocks, it is logically difficult to see why this will be enhanced by increased dependence on world markets.

I wish to focus on the first and second argument for trade liberalization, the static and dynamic effects. However, my distinction *within* these two categories is a bit different from that applied by Rodrik. With respect to the static effects, I do not only include allocative efficiency, but also X-efficiency, or micro-economic efficiency. This distinction goes back to Leibenstein (1966). There is an improvement in X-efficiency if the same output is produced with less resources, or more output is produced with the same amount of resources. Allocative efficiency is improved if resources are better allocated over the whole economy. In the Pareto optimal situation, it is not possible to increase the output of any good without

reducing the output of at least one other good. Both X-efficiency and allocative efficiency are static effects: they are one-time improvements as a result of the change in relative prices which follows from trade liberalization.

For industrialized countries, the expected benefits of trade liberalization on dynamic efficiency are considered even more important. This has been demonstrated, in particular, in the literature on regional economic integration (Baldwin 1994, Molle 1990). Improvements in static efficiency will increase the growth rate of the economy, but only temporarily so. An improvement in dynamic efficiency is expected to lead to a permanently higher growth rate (Baldwin 1994). This can be the result of permanently higher rates of investment, of more investment in research and development (R&D) and more technical innovation, and of higher levels of (technological) learning in the economy and consequently, higher productivity growth. Improvements in all three types of efficiency will definitely enhance total welfare in the economy. However, there may be trade-offs between the different types of efficiency. In that case the net effect on total welfare may be ambiguous.

Static effects

Does trade liberalization lead to increases in X-efficiency and allocative efficiency? It can be expected that trade liberalization leads to lower prices for imported goods. Firms and households that use imported goods will benefit from this. Whether or not this leads to higher X-efficiency in firms depends on the trade regime for imported inputs and machinery before the trade liberalization. In many countries, trade restrictions and quotas for imported inputs and machinery were already much lower than for final goods.

Orthodox theory also postulates that the increased competition from imported goods forces domestic producers of import competing goods to be more efficient, resulting in higher X-efficiency. However, this assumes that at higher output prices, the substitution effect (more leisure/slack) dominates the income effect for the firm (manager). This cannot be expected to be true for all firms (see Marshall 1992). In addition, *if* substitution effects dominate income effects, exporting firms can be expected to reduce X-efficiency after trade liberalization. For them, the higher output prices will lead to more slack/leisure (Marshall 1992; Rodrik 1995). As a result, the net overall effect on X-efficiency in manufacturing is not clear, and depends on:

- the trade regime for imported inputs for manufacturing (raw materials, equipment) before trade liberalization;
- the dominance of income or substitution effects for industrial firms (managers); and
- if substitution effects dominate, the relative importance of import competing as opposed to exporting sectors before trade liberalization.

Firms in import competing sectors that do not succeed in improving their efficiency after trade liberalization and whose production costs are higher than prices for imported substitutes, will go bankrupt. The resources (capital, labour) involved in producing these goods before trade liberalization will be freed and will go to other sectors where they can be used more productively. At the same time, higher domestic prices for exports will lead to more exports and this may contribute to higher allocative efficiency. We can conclude that allocative efficiency unambiguously increases as a result of trade liberalization. However, the effects on manufacturing depend on whether or not the manufacturing sector has some comparative advantage at the outset.

In general, the combination of improvements in X-efficiency and allocative efficiency can be expected to lead to welfare gains for the economy as a whole. However, the coming about of positive allocative efficiency effects will always be accompanied by adjustment cost, since resources (labour and capital) cannot instantly move from one sector with low comparative advantage to another sector with higher comparative advantage.

In general, theory predicts that the welfare gains from improvements in allocative efficiency will be larger for small countries since the change in relative prices resulting from trade liberalization will be larger for small countries than for large countries. The corrollary of this is that adjustment costs also tend to be larger for small countries than for large countries (Helleiner 1996). With respect to improvements in X-efficiency, for small countries the costs of closing the economy tend to be higher. Conversely, the same proportional liberalization of trade in imported inputs for manufacturing will have larger positive effects for small countries than for large countries.

Until now, competitive markets were assumed. Do the expected welfare gains from trade liberalization also come about in less competitive markets? It can be shown that static efficiency effects to some extent depend on the assumption of competitive markets. A first case is a situation in which the domestic market of import competing producers is characterized by oligopolistic competition. This is a quite realistic assumption for manufacturing in developing countries. The case has been examined by Levy and Nolan (1992). In principle, the entry of foreign goods enhances competition in the domestic market, lowers prices and increases welfare. However, as Levy and Nolan show, the loss for domestic producers quite likely exceeds the increase in consumer surplus. Although overall welfare increases, from the perspective of the country too much of this increase accrues to foreign firms. Levy and Nolan do not conclude from this that trade should be restricted. A 'first best' policy is to subsidy sales from domestic firms and to tax sales by foreign firms. However, if this is not feasible given the limited state capacity to carry out discriminating policies, then tariffs can be used. These tariffs do not need to be very high: trade reform which reduces tariffs to about 15% is welfare enhancing, also if the domestic market is oligopolistic. Levy and Nolan do not take into account the longer run effects of trade liberalization, which allow for more exports from domestic firms. Especially if increasing

returns to scale are involved, these long-run (dynamic) effects may be considerable (see below).

Conventional wisdom also holds that the absence of trade restrictions leads to a volume of imports that is 'just right'. However, in the case of an oligopolistic production structure in the home market liberalization quite likely leads to an excessive volume of imports, that is, to more imports than desirable from the domestic economy point of view (Levy and Nolan 1992: 56). This is due to the fact that home prices before trade liberalization are too high as a result of imperfect markets (higher than their social opportunity costs), and import prices too low. This means that trade liberalization does not increase allocative efficiency to the full extent. However, also in this case tariffs do not need to be very high, so trade liberalization as it is usually implemented increases allocative efficiency.

Another case is that of imperfect markets in the trade sector of developing countries. This is also a very realistic assumption. Although trade liberalization leads to lower import prices at the border, these lower prices tend not to be reflected in lower domestic prices. Several types of market imperfection can be distinguished. If imported goods are of a high-tech or high price nature (for example machinery or agricultural equipment) or if economies of scale are involved in the importing itself (large distance imports), there is a natural tendency for the import market to be dominated by one or a few agents. If imported goods consist of smaller units for which not much specific knowledge is required to sell or use them (food, clothing), perfect competition is more likely. However, the market structure of the domestic retail network may still deviate from perfect competition. If the ownership of the domestic supermarkets, for example, is concentrated, it is still possible that imported food is sold at a much higher margin from the border prices than the marginal costs would predict (see Dijkstra 1996 for Nicaragua).

On the export side, trade liberalization involves lowering or abolishing export restrictions and export taxes. Whether prices of exportables increase for domestic producers depends once again on the domestic market structure in trade. If government intervention is replaced by private monopsonistic or oligopsonistic control of export production, price increases at the border are not passed on to (small) producers. The expected increase in allocative efficiency does not come about.

As a result of these imperfect markets in domestic trade, trade liberalization does not lead to the expected improvement in X-efficiency in the import competing sectors: prices of domestic sales of imported goods continue to be high. At the same time, an eventual reduction in X-efficiency in the exporting sector also does not come about. However, these market imperfections unambiguously reduce the expected improvements in allocative efficiency. In the case of small countries, the losses in potential allocative efficiency are larger than in large countries. At the same time, it is probably more likely that oligopolistic competition occurs in small countries precisely because markets are small.

From a political economy point of view, the imperfect markets in production and in trade represent very different situations. If the structure of domestic production is oligopolistic and no increasing returns to scale are involved in production, these producers will resist trade liberalization since their welfare will be reduced. If economies of scale are important, and the firms expect to benefit from increased export markets they will be in favour of trade liberalization. In the latter case, it is also possible that potential beneficiaries from trade liberalization will not so much strive for trade liberalization in general, but, instead, for export promoting measures. In the case of an oligopolistic structure of the domestic trade sector, these traders will be in favour of trade liberalization since it allows them to obtain large profits in the domestic market. This may create a problem for dynamic efficiency of the economy (see below).

Dynamic effects

Dynamic efficiency implies that the economy achieves a permanently higher growth rate. However, it is not so clear how trade liberalization leads to this positive effect. Usually, competition and increasing returns to scale are mentioned as factors that contribute to a higher growth rate. Increased competition has the static effect of import-competing firms having to reduce costs, but it also has a dynamic effect of a permanent drive for firms to lower cost and be more efficient. However, while in the short run productivity can be increased by reducing slack in the organization, in the long run investments are necessary.

The impact of competition on investment and innovation is not clear, however. On the one hand, competition reduces profit margins which limits the scope for investment in general, and for investment in Research and Development (R&D) in particular. This is the famous Schumpeterial argument that some form of imperfect competition is required in order to stimulate investment and innovation. On the other, the larger market increases the potential benefits of R&D activities. Firms seem to solve this dilemma by, on the one hand, permanently striving for lower costs, higher quality and more specialization (the market 'niches'), and on the other, maintaining some 'slack' (extra profits) that can be used for R&D activities. The latter is achieved by building financial reserves and by merging or cooperating with other firms (Groot 1997). The net result of these processes probably is more investment in innovation. An unambiguous positive effect of trade liberalization is that a larger market enhances the international cooperation and specialization in R&D activities and reduces redundancy in these activities (Baldwin 1994, Rodrik 1995).

A second argument for dynamic effects of trade liberalization is related to the existence of increasing returns to scale. For industrialized countries, an accepted exception from the idea that free trade is always the superior policy is provided by the so-called strategic trade theory. Increasing returns to scale make it advantageous for the government to protect the industry, in order to eliminate competitors from other countries or regions or prevent them from coming into existence. This is the theory of the optimum tariff. It may hold for

countries that are big exporters of a certain product, so that they are able to influence the world market price. However, as Lal (1993) argues, the optimum tariff may be beneficial in the short run, but does not take potential retaliation into account.

This optimum tariff policy does not seem to be applicable in most developing countries since it is unlikely that they have industries that dominate the world market, such as building aircrafts. But the case of increasing returns to scale is applicable. If a country has industries of this type, where average costs are above marginal costs, a larger market due to trade liberalization is beneficial, in principle. This is the positive effect in the long run. We saw above that the short-run welfare effects of trade liberalization in the presence of increasing returns to scale and the accompanying oligopolistic competition are ambiguous, when the competition from foreign firms in the domestic market dominates. If the country does not have any industries where economies of scale apply, trade liberalization implies that they will not come into existence: it is much cheaper to import these goods.

From the above discussion it is clear that there are net positive dynamic effects from trade liberalization, both from more competition and from increasing returns to scale. However, in both cases these effects will only come about if a country has already achieved a certain level of industrialization. The positive effects from competition only follow if R&D activivities take place in the economy so that cooperation and specialization between and among firms can come about. Increasing returns to scale are also related to manufacturing industry, and are unlikely to be important to the same extent in primary goods production. Taking also the demand side into account, we can say that the long-turn growth effects of trade liberalization depend on three conditions (see also Zattler 1996):

- whether the economy specializes in sectors with a *high income elasticity of demand*;
- whether the economy has sectors in which R&D activities are important so that there are learning effects and technological spill-overs;
- whether the economy has sectors characterized by increasing returns to scale.

It is evident that there may be a trade-off between the static improvements in allocative efficiency and dynamic gains from trade. Many developing countries have a static comparative advantage in primary goods for which the income elasticity of demand is lower than for industrial goods. Even if developing countries have a comparative advantage in manufacturing, this tends to be manufacturing that uses cheap labour intensively, or consists of the processing of primary resources. In both cases, income elasticity of demand is relatively low: industries based on cheap labour tend to produce mass production of goods of lower quality for which demand will decline relative to high-quality goods. Most industries based on processing of raw materials are subject to the risk that substitutes will be developed so that also here income elasticity of demand tends to be low. A relatively low income elasticity of demand for the exporting sectors of the economy implies that long-term growth is lower due to a relative decline of the international terms of trade.

An additional risk for countries specializing in primary goods or in industrial goods of relatively low quality, is the *fallacy of composition*. If many countries specialize in these goods at the same time, it may affect the international prices of these goods negatively. It is possible that the 'small country assumption' no longer applies (Evans *et al.* 1992).

The allocative efficiency improvement in developing countries well endowed with cheap labour and/or natural resources will lead to more production and exports in manufacturing sectors based on these resources. Sectors based on cheap labour may be characterized by internal economies of scale. But they tend not to give rise to innovative activities, nor to technological spill-overs or learning effects. For industries based on the processing of natural resources the picture is a bit brighter in this respect. They are most likely characterized by increasing returns to scale, and there is also more investment in R&D. Developing countries for which the static comparative advantage is related to primary exports and industries intensive in cheap labour, long-term growth prospects are not very good. They do not benefit from the positive dynamic effects of trade liberalization.

As to the political economy of trade liberalization, it will be favoured by exporters of primary goods, respectively by exporters of industries based on cheap labour and/or processing of primary resources. Import competing manufacturing sectors will not be in favour of trade liberalization, unless firms in these sectors expect to be strong enough to benefit from exports. Manufacturing industries in which internal economies of scale apply are more likely to support trade liberalization than other manufacturing firms. This means that large countries, where perhaps industries with increasing returns to scale are more likely to have come about during a period of trade restrictions, are also more likely to start with trade liberalization. They will be the first to benefit from dynamic gains from trade.

Concluding, it seems that small developing countries that have their comparative advantage in primary goods and/or in industry based on cheap labour, face a trade-off between allocative efficiency and dynamic efficiency. Although the positive allocative efficiency effects tend to be larger than for large countries (but adjustment costs are also larger), the long-term effects are more negative. The specialization in agriculture or in industries based on cheap labour means that income elasticity of demand is lower, no economies of scale apply, and less innovative activities take place. For developing countries specializing in industries processing raw resources, the same risks apply with respect to income elasticity of demand, but economies of scale are more likely to exist and there are more chances for long-term productivity increases.

Small countries that have no static comparative advantage in industries with increasing returns to scale or with a high degree of innovative activity, and that are also characterized by imperfect markets in trade are even worse-off. There are no dynamic efficiency gains, *and* the welfare gains according to allocative efficiency improvements do not come about. If the

persons having an interest in trade are politically strong, trade liberalization will be maintained and policies to promote production will not come about.

In sum, it is important to separate potential static and dynamic effects of trade liberalization, and an eventual absence of them. From a development perspective, the long-term, dynamic effects are more important than the short-term effects. This does not mean that no trade liberalization should be implemented if no dynamic effects can be expected, but it does mean that complementary action has to be taken to avoid that less industrialized countries will be maintained in their static comparative advantage resulting in much lower growth rates than richer countries.

3. ASSESSING THE IMPACT OF TRADE LIBERALIZATION

In assessing the effects of trade liberalization several issues need to be considered. A first issue is to examine to what extent trade liberalization has been implemented, and what other policies have been carried out that may reinforce or contradict the effect of trade liberalization. In sum, we have to assess to what extent domestic prices really reflect the changed relative prices for importables and exportables (see Milner and Greenaway 1997).

A second problem is to choose suitable indicators for enhanced static and dynamic efficiency (Weeks 1996). Can we use growth of manufacturing industry as an indicator? The problem with this indicator is that a low growth rate may reflect an increase in allocative efficiency, while at the same time it may reflect a lack of dynamic efficiency. If we give priority to the second kind of efficiency, we will call a low or negative growth rate for industry 'deindustrialization', otherwise we would call it increased (allocative) efficiency. The World Bank (1994) seems to struggle with these concepts as well. As summarized in White (1996: 798-9), the Bank defines deindustrialization as 'a significant, non-temporary decline in output and employment which is not consistent with the efficient reallocation of resources, and *thereby* (it: gd) places the economy on a lower growth trajectory'. This formulation is not very helpful, since it does not make the dinstinction between static and dynamic effects, and seems to assume that the two are the same. However, it is perfectly possible that lower output and employment in industry are consistent with short-term allocative efficiency, but not with long-term growth.

A third problem in assessing the impact of trade liberalization is the fact that many other factors may hamper eventual positive effects on the static and dynamic efficiency of manufacturing industry. The expected 'supply response' by producers may be hampered by:

- the institutional environment: the structure of markets, the property rights structure;
- the availability of other supporting factors: human capital, financing possibilities, technology, infrastructure, transport;
- general factors, such as political stability, and monetary stability.

A first step in the research would be to assess what happened to domestic prices for importables and exportables. If the exchange rate is overvalued, or if there is an oligopsonistic market for exportables or an oligopolistic market for importables, domestic prices for these goods don't change in the expected direction. And if this is the case, we cannot expect any of the expected effects on efficiency to come about. It is important to examine actual prices before and after trade liberalization, since the existence of parallel markets may have made 'before' prices less distorted then generally assumed (Rodrik 1990). In the following, we assume that these changes in relative prices occur and we examine possible indicators for the different types of efficiency.

Indicators

Increases in X-efficiency are expected to occur in the import competing sectors. Indicators include figures on labour productivity and on capital productivity in the years just before and just after the trade liberalization. In exporting sectors, we expect productivity to decrease just after trade liberalization. This can also be examined. Furthermore, labour productivity in relatively import-intensive sectors should improve. However, in countries where import substitution policies were carried out before trade liberalization, imports of capital goods and intermediate goods for industry tended to be cheap. Trade liberalization will probably maintain these low prices or even increase them. If this is the case, we cannot expect productivity increases in sectors intensive in the use of imported inputs.

Within manufacturing, an improvement in allocative efficiency occurs if branches more in line with the country's comparative advantage grow, and others decline. As did Weeks (1996), it is possible to examine whether structural change has occurred in manufacturing and to assess changes in the structure of manufacturing after trade liberalization in light of the expected comparative advantage.

Another expected allocative efficiency effect is a change away from import competing sectors to exporting sectors. This does not automatically imply that such a change should also occur within manufacturing industry, so from import competing industries to exporting industries. If a country does not have any comparative advantage in industry, the structural change will involve less industry and more primary production.

For assessing dynamic efficiency effects, GDP growth is a relevant indicator. On a more detailed level, manufacturing growth can be considered to have more impact on long-term growth than other sectors, so growth of the industrial sector is also an indicator. For the same reason, investment in manufacturing is important. Within manufacturing industry, dynamic efficiency will be larger in branches that make intensive use of skilled labour as opposed to sectors intensive in unskilled labour. Branches intensive in raw resources have an intermediate position. This ordering of branches is based on a) expected increases in

productivity and learning effects b) expected internal economies of scale, and c) expected income elasticity of demand (see above).

Another indicator for dynamic efficiency is whether productivity increases can be registered, also after an initial period of, for example, three years after the trade liberalization. One can examine productivity increases in all branches of manufacturing. In this area, both labour productivity and total factor productivity can be examined - the latter is an indicator of technological change. Other indicators for technological change are the investment in R&D, and the number of registered patents.

Finally, growth of manufactured exports can be considered an indicator for dynamic efficiency. One can look at growth of the absolute value of manufactured exports, and at the share of manufactured exports in total exports. Long-term growth will be enhanced if countries specialize more in skill intensive manufacturing production. Therefore, the growth of skill intensive manufactured exports, and the share of skilled manufactured exports in total manufactured exports are suitable indicators.

Although it is difficult to measure the income elasticity of demand for exports directly, an approximation can be obtained by using the CAN software with data on manufactured exports to OECD markets (see Buitelaar and Van Dijck 1997). With this software, it is possible to assess whether a country's market share increases in 'dynamic' markets or in 'stagnant' markets. The dynamic markets can be considered to have a larger income elasticity of demand.

4. OVERVIEW OF EVIDENCE

Although the extent to which trade liberalization has taken place varies from country to country, in all Latin American countries some trade liberalization occurred. With respect to imports, quotas have been abolished and tariffs have been reduced. Export taxes have also been reduced and government marketing boards no longer exist. In many countries specific export promotion measures exist. For most countries it is still early to assess the effects: they carried out serious and drastic trade reforms between 1989 and 1992 (Agosín and Ffrench-Davis 1993). However, Chile started with radical trade liberalization in 1974, and Mexico and Bolivia began in 1985. For these countries some case studies of the impact of trade liberalization on manufacturing are available.

Productivity

Productivity growth in manufacturing is an indicator for both static efficiency if we look at short-term effects, and for dynamic efficiency if we look at long-run effects. For Mexico, Weiss (1992) showed that labour productivity growth was higher after trade liberalization (1985-1989) than before (1981-1985). Comparing 48 manufacturing branches, he found a

weak but statistically significant relationship between trade liberalization, measured as a smaller difference between international and domestic prices, and labour productivity growth. Between 1984-1986 on the one hand, and 1987, on the other, 20% of the increase in labour productivity growth could be explained by trade liberalization.

Jenkins (1995) studied labour productivity in Bolivian manufacturing. This productivity was lower than the 1980 level in the first half of the 1980s, then turned above that level since 1986. Regressing absolute figures of labour productivity on growth in value added, capacity utilization and a dummy for trade liberalization, all factors are significant and have the expected sign. This means that Bolivian trade reforms may have induced higher labour productivity. However, regressing labour productivity *growth* on these factors, the capacity and growth of value added factors were no longer significant, and the liberalization dummy only at the 10% level. This may imply that dynamic efficiency effects did not occur. However, for Bolivia it is still rather early to examine long-term productivity effects of trade liberalization.

For Chile it is possible to analyze both short-run and long-run effects of trade liberalization on productivity. However, studies widely differ in productivity definitions, methodology, and in the years they compare (see also Pietrobelli 1994). The latter is important since productivity developments are influenced, among other factors, by macro-economic situation which moved from recession (1974-1976) to boom (1979-1981) to another recession (1982-1985). Manufacturing output followed this business cycle closely, while manufacturing employment continuously declined between 1973 and 1982 and recovered a bit between 1983 and 1986 (Gatica 1989). On average, annual labour productivity increased by 5.3% between 1972 and 1982, and decreased by 11.8% between 1983 and 1990 (Richards 1997).

Comparing productivity levels at the plant level by using census data of 1967 and 1979, Tybout et al. (1991) found that overall productivity fell, but there was a positive relationship between reduction of protection and increases in labour productivity. This relationship was strongest with smaller firms. Marshall (1992) reports a significant increase in "X-efficiency"[2] between 1974 and 1979, and a less significant (90% level) deterioration of X-efficiency between 1979 and 1986. Marshall also found that there was a positive and weakly significant relationship with trade liberalization, measured as a reduction of the effective rate of protection and an increase in import share.

For Chile, it seems that increased competition from imports coupled with low internal demand led to large-scale labour shedding and closing of firms in the first period of trade liberalization 1974-1979, leading to higher labour productivity. After 1982, a lack of financing for new investment and low wage levels provoked a labour intensive production process, reducing labour productivity (Gatica 1989, Pietrobelli 1994). A general conclusion from all three countries is that there are weak positive effects of trade liberalization on labour productivity in the short term, but that other factors are probably more important to explain

productivity growth.[3] For the long run, no positive effects of trade liberalization could be found.

Structural change

If trade liberalization changes the relative domestic prices for importables and exportables, we expect structural changes in manufacturing to occur. The economy will produce more according to its comparative advantage, or according to its endowments. This is the allocative efficiency effect. In this respect, it can be expected that Latin America is good at labour intensive products and in products intensive in raw resources. In manufacturing, the latter often means production of intermediate goods. A structural change in the direction of technology intensive and human capital intensive goods would be an indicator of positive dynamic efficiency effects.

Weeks (1996) examined whether there was structural change within manufacturing for five Latin American countries taking all years between 1970 and 1992 (and sometimes 1963-1992) into account. All possible inflection points were tested and only statistically significant results are reported. A structural change in the direction of intermediate goods for the later years is reported for Colombia (1985-1992) and Mexico (1983-1992), but not for Argentina, Brazil and Chile. There is some evidence for a lower share of consumer durables and capital goods in Chile between 1981 (for capital goods 1983) and 1992, and for a lower share of capital goods in Mexico between 1983 and 1992.[4] However, it is difficult to draw conclusions from these results. The periods for which statistically significant structural change is reported often begin earlier than the trade liberalization so that it cannot be ascribed to the liberalization.

Gatica (1989) analyzed structural change in Chilean manufacturing over the period 1967-1982. Most manufacturing branches experienced large production declines. The most important factor was the reduction of domestic demand, but eight branches were also severely affected by competition from imports (textiles, wearing apparel, leather, footwear, pottery, glass, machinery and professional equipment). Four branches experienced output growth that was partly due to increased exports (food, paper, other chemicals and electrical machinery). In Nicaragua, overall manufacturing production remained stagnant between 1990 and 1993 after a drastic trade liberalization (Dijkstra 1996). However, there were large differences between branches. Some virtually disappeared as a result of import competition, an overvalued exchange rate and reduced domestic demand (textiles, clothing, leather and footwear), others for which domestic deman is more stable (food, beverages) fared better.

Valdes (1992) compared output in 1965-1970 with output in 1978-1980 and 1988-1990 in Chile, thus quantifying the extent of structural change in a first and a second period of trade liberalization. He analyzed both structural change between sectors of GDP, and within manufacturing by comparing actual relative output shares with potential relative output shares. In contrast with theoretical expectations, the share of nontradable production (mainly commerce and services) in total GDP increased relative to tradable production during the first

period, and maintained constant in the second. Valdes does not give an explanation, but it can be explained by the fact that during most of the first period, the exchange rate was overvalued so that desubstitution of imports by far exceeded the increase in exports. In addition, when it was not (1974-1978), the drastic financial liberalization caused an increase in investment in trade and services at the cost of productive investment. Industry as a whole decreased sharply in the first period (lost 3% of GDP compared to potential relative output), and moderately in the second (another 1% of GDP). However, changes within manufacturing were even bigger. Import substituting manufacturing branches registered an output decrease of 3.4% of GDP, while natural resource based branches decreased by another 0.7% of GDP. In the second period, import substitution branches continued to decline (by 4.4% of GDP relative to potential output). In this period, natural resource based branches increased output by 1.1% relative to potential output.

All in all, the Chilean (and Nicaraguan) experiences show the expected decline in import substituting industries, although part of this must be explained by the fall in domestic demand (for Chile: mid-1970s) and by an overvalued exchange rate (Chile: 1978-1981). The positive effect of trade liberalization on industries in which Chile has a static comparative advantage (natural resource based industries) did not occur until the 1980s when the exchange rate was more favourable for exports and when export stimulating measures were in place (Pietrobelli 1994: 440). This means that export stimulating measures were required even for bringing about the positive static allocative efficiency effects.

Positive static efficiency effects, both X-efficiency and allocative efficiency, were also hampered by the oligopolistic structure of the Chilean economy which hampered competition and the working of the market. With the privatization and financial liberalization, the "grupos económicos" even strengthened their position since they purchased former state enterpriss at bargain prices and monopolized the access to cheap foreign credits. By the end of 1978, five economic groups controlled 53% of total assets of the largest 250 private enterprises in Chile (Pietrobelli 1994, 454).

In countries that already have a developed industrial base we can expect trade liberalization also to bring about structural change in the direction of human capital intensive and technology intensive sectors. For Mexico, James (1991) observed that, already in 1985, the country had a lower share of capital goods production in total manufacturing production as compared to other large countries such as Brazil and India. He explains this, among other factors, by relatively low protection and limited institutional and financial support for this sector. After 1985, the production of capital goods even declined, although exports of the sector increased due to the exchange rate policy.

Chudnovsky and Chidiak (1996) examine the impact of trade liberalization on three capital intensive sectors in Argentina (paper, petrochemical industry and iron and steel) by comparing 1990 and 1994 data. All branches experienced increases in import shares. This seems to have led to increased productivity, higher concentration and more vertical integration in these branches. In paper, and iron and steel production increased, in cellulosis

and petrochemicals it did not. But competition from imports did not lead to a collapse of these branches. Chudnovsky and Chidiak explain this from the import substitution policies of the past which have led to the building up of technological capacity in these branches. However, trade liberalization did not lead to substantial investments. Investment seems to have been hampered, among other factors, by uncertainty over general macro-economic policies and over developments in MERCOSUR.

The experiences of these two countries confirm that even in these large countries with a developed industrial sector, trade liberalization is unlikely to promote the expansion of technology intensive production by itself. We now turn to some other indicators of dynamic efficiency.

Growth, R & D and exports

With respect to manufacturing output as a whole, Weeks (1996) found no statistically significant increases in seven Latin American countries after trade liberalization. Mexico and Chile experienced a statistically significant lower growth of manufacturing after the liberalization (1983 was the inflection point for Mexico, 1975 for Chile).

From the evidence we have on investment in R & D in Latin America, these investments were rather low in the early 1980s comparing to other regions (Alcorta and Peres 1995). They even decreased on average between the early 1980s and the early 1990s from 0.44% of GDP to 0.40% of GDP. There are large variations among countries, but no country has R & D expenditure above 1% of GDP. Trade liberalization seems to have had negative effects on the investment in R & D, on average.

For the whole Latin American region, manufactured exports have increased and have become more skill intensive and more technology intensive in the 1980s (IDB 1992). However, the distribution of the origin of these exports is very uneven. The lion's share comes from Mexico and Brazil. The IDB defines high-tech exports as including ISIC two digit 51, 54, 58, 71, 72 73, and 86. Then Brazil, Mexico, and Argentina account for 96.4% of the regional exports of these goods. The IDB also shows that revealed comparative advantage for Latin America in high-tech exports has increased between 1978-1980 and 1988-1990. However, given the domination of a few countries, we cannot conclude much on the revealed comparative advantage of all other countries.

For Mexico, the study by Weiss cited above (Weiss 1992) reports a weak but significant positive relationship between trade liberalization and manufactured exports, comparing manufactured export growth between the years 1984-1986 and 1987. 13% of the variation in export growth can be explained by a decrease in protection.

Pietrobelli (1994) analyzed the share of skilled labour intensive and technology intensive exports in total exports in Chile. He found that these shares declined between 1966 and 1986, while the share of low skill and low technology exports increased. Within manufactured

exports, the same trend could be observed. This is in keeping with the structural change towards natural resource intensive manufacturing branches reported above.

Buitelaar and van Dijck (1997) examine the market shares for manufactured goods of eight rather small Latin American countries. They show that seven out of these eight countries export more manufactures to stagnant OECD markets than to dynamic OECD markets. Six countries increased their market share in stagnant sectors between 1977 and 1994, while only four increased their market share in dynamic sectors. This points to a lower income elasticity of demand for most manufactured exports of these countries.

With respect to dynamic efficiency in manufacturing in Latin America, we conclude that the relationship with trade liberalization was not positive. For the country with the longest experience with trade liberalization, there was no positive development in productivity growth and its manufactured exports became less skill and technology intensive. Overall, the expenditure on R & D in Latin America decreased from already low levels. Manufactured exports from small and medium Latin American countries are directed to stagnant markets. Even the large Latin American countries that increased high-technology exports seem to have a problem in maintaining investments in these sectors.

5. MANUFACTURED EXPORTS FROM LATIN AMERICA

Since the development of manufactured exports is an important indicator for dynamic efficiency I analyzed some further trends in these exports between 1970 and 1992, for 16 Latin American countries: Argentina, Bolivia, Brazil, Chile, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay and Venezuela. This period is not the period in which trade liberalization took place. The 1970s were the era of booming primary exports and continued protection of manufacturing goods, in the context of import substitution policies. Only Brazil and Mexico followed somewhat different strategies as of the end of the 1960: overall high tariffs were combined with export promotion measures. Chile, Argentina and Uruguay pursued orthodox trade liberalization since 1974, but in the latter two countries these liberalization policies were short-lived.

The 1980s were dominated by the debt crisis and the adjustment to the debt crisis. The terms of trade for primary exporters declined, especially in the first half of the 1980s. Oil exporters such as Mexico and Venezuela suffered much less from the terms of trade decline. The region experienced a recession which reduced regional demand for manufacturing goods. Trade policies did not change much in the early 1980s; if anything, more import restrictions were imposed in order to cope with the balance of payments problems. In sectors where exports compete with domestic demand, exports increased as a result of the domestic recession. In the second half of the 1980s policies changed and trade liberalization began in many countries. The terms of trade for primary exporters also improved. Finally, in the 1990s trade liberalization was introduced in all countries and often very radically. Although we cannot say that trade liberalizarion characterized the whole period from 1970 to 1992,

trade did increase during this period so we can say that it was a period of increased world market integration for the region.

As a first step, I attempt to explain the annual average growth rate of manufactured exports for the whole period, so between 1970 and 1992. Several explanatory variables were included. Education, in particular enrollment in primary education (EDU) was the first one. The IDB (IDB 1993) found that one year of additional schooling led to an increase in total exports in Latin America. We can expect that education also leads to more manufactured exports. Another factor was Gross National product in 1970 (GNP). I also expect a larger domestic market to result in a higher growth rate of manufactured exports. The importance of a large home market was stressed already by Rosenstein-Rodan (1943) and Hirschman, and more recently by Bardhan (1995:2993). Industries can benefit from both internal and external economies of scale. The Gross National Product per capita in 1970 (GNP/C) was included as a proxy for many other supporting variables that may enhance manufactured exports, such as the quality of the labour force and the quality and quantity of infrastructure. Since it is often said that the structure of the economy in the base year, or the prior development of the industrial sector is important in determining the sector's supply response (FitzGerald 1996, Zattler 1993), I included the share of manufacturing in Gross Domestic Product in 1970 (Man/GDP). Manufacturing production in general is often found to be a function of availability of imports, and I wondered whether this would also hold for manufactured exports. So I included the growth rate of imports (IMPGR). Finally, I examined the influence of investment in Research and Development (R & D), using figures for the early 1980s. In order to approximate normal distributions across the 16 countries, logarithms were taken of GNP, GNP/C and R & D. Primary education enrollment was raised to its fourth power.

The source for the data on investment in R & D was Alcorta and Peres (1995) and for all other non-export data the World Tables of the World Bank. The export data were obtained from the *United Nations Commodity Trade Statistics*. These data were available on a two-digit level of SITC, revision 1 for all years. Manufactured exports are defined as SITC categories 5-8, with the exclusion of 68 (Non metallic minerals). This means that natural resource based manufactured exports (which can be found in SITC 0-4 and 68) are excluded.

The regression results are shown in the Appendix table. There are only two variables where the regression coefficient has a consistent sign over different specifications: these are GNP and education. The sign is positive, as expected. However, regressing only EDU on the growth rate of manufactured exports gives a rather strange R^2. The coefficient of GNP is more robust, and is significant in all specifications.

Some other results are worth noting. The coefficient of MAN/GDP is negative in most specifications, and is often significant. In combination with GNP, it is always negative and almost always significant. This means either that this factor is not important in explaining manufactured exports, or that the share of manufacturing in GDP is not a good indicator for the initial level of manufacturing production. Similarly, GNP per capita does not seem to be

a good proxy for the other supporting factors that may enhance manufactured exports. The coefficient is also often negative and significant. The import growth rate, taken over the whole period, and investment in R & D in the early 1980s, do not seem to have any relationship with the growth of manufactured exports in Latin America.

We conclude that the size of the domestic market (measured as GNP) played an important role in whether or not manufactured exports increased during this period. Earlier, we concluded that large countries will have less positive allocative efficiency effects from freer trade, and also less adjustment costs related to allocative efficiency improvements, but that countries which already have an industrial base will have more dynamic efficiency gains from trade liberalization. In Latin America, the larger countries seem to have had a larger industrial base at the outset. Although the period was not exactly one of trade liberalization, it was one of increasing international world market interdependence. Our finding that manufactured exports increased more from large countries than from small countries confirms that large countries, provided they have achieved a basic level of industrial development, seem to benefit more from increased world market integration.

To see what exactly happened to manufactured exports from large and from small countries in Latin America, we broke up the group of 16 Latin American countries in three groups:

- large countries: Argentina, Brazil and Mexico with GNP of $33,068 million or more in 1970;
- middle countries: Chile, Colombia, Peru and Venezuela with GNP between $6,868 and $13,255 million in 1970;
- small countries: Bolivia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay and Uruguay, with GNP of less than $2,078 million in 1970.

Although there were some order reversals between 1970 and 1990 among the 16 countries if ordered according to GNP, this did not affect the border lines of the three groups. In the following, I compare the group of large countries with that of small countries.

Figure 1 shows total exports and manufactured exports for the group of large countries. Both increased during the whole period, but total exports are somewhat more volatile. This is probably due to price fluctuations for primary goods and to variable weather conditions. The strongest export growth was between 1979 and 1984 (with a dip in 1982), so including the years of the debt crisis. Manufactured exports increased steadily over the whole period, with small dips in 1982 and 1990. For small countries (figure 2), total exports increased very rapidly until 1980 but they declined after that. From 1987 on, exports recovered but at a lower growth rate than in the earlier period. Negative terms of trade seem to have had a strong impact on these exports between 1980 and 1987. Contrary to the experience of the large countries, manufactured exports did not continue to increase in the 1980s, but they fell

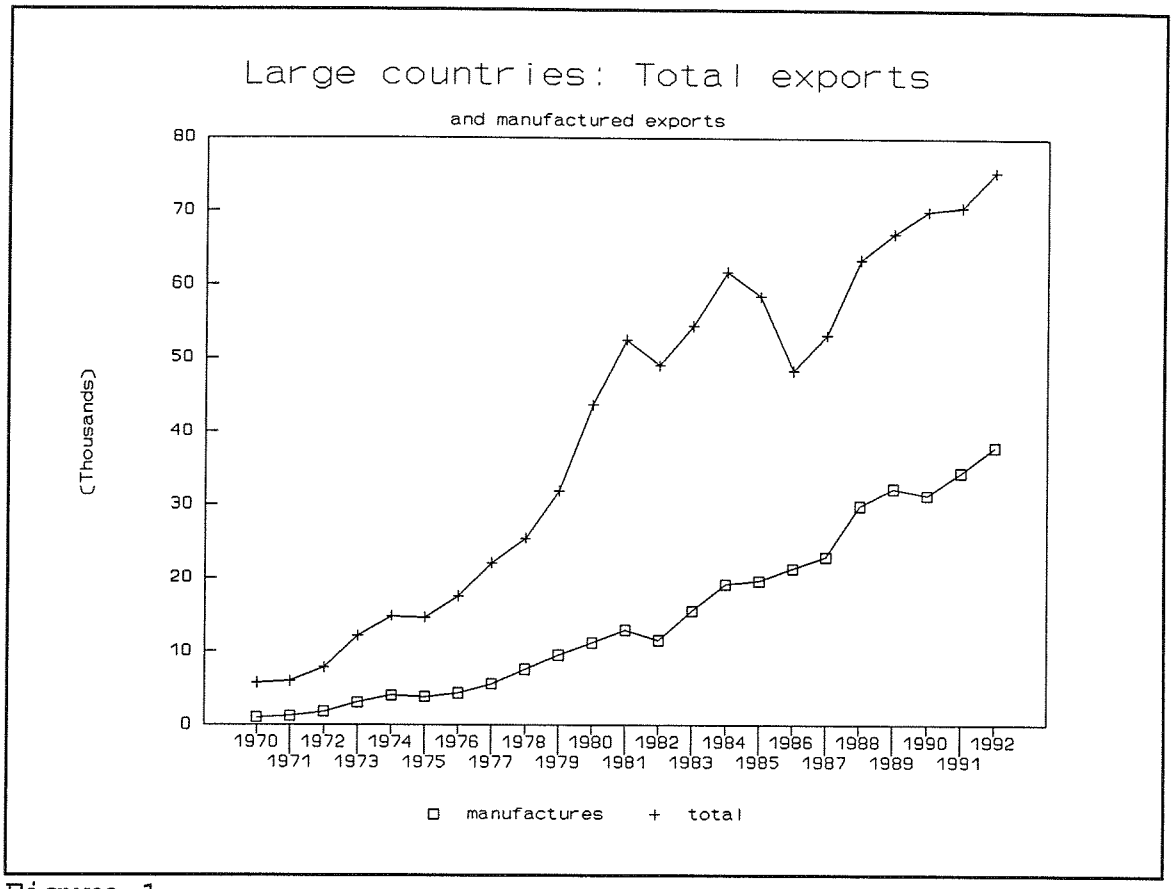

Figure 1

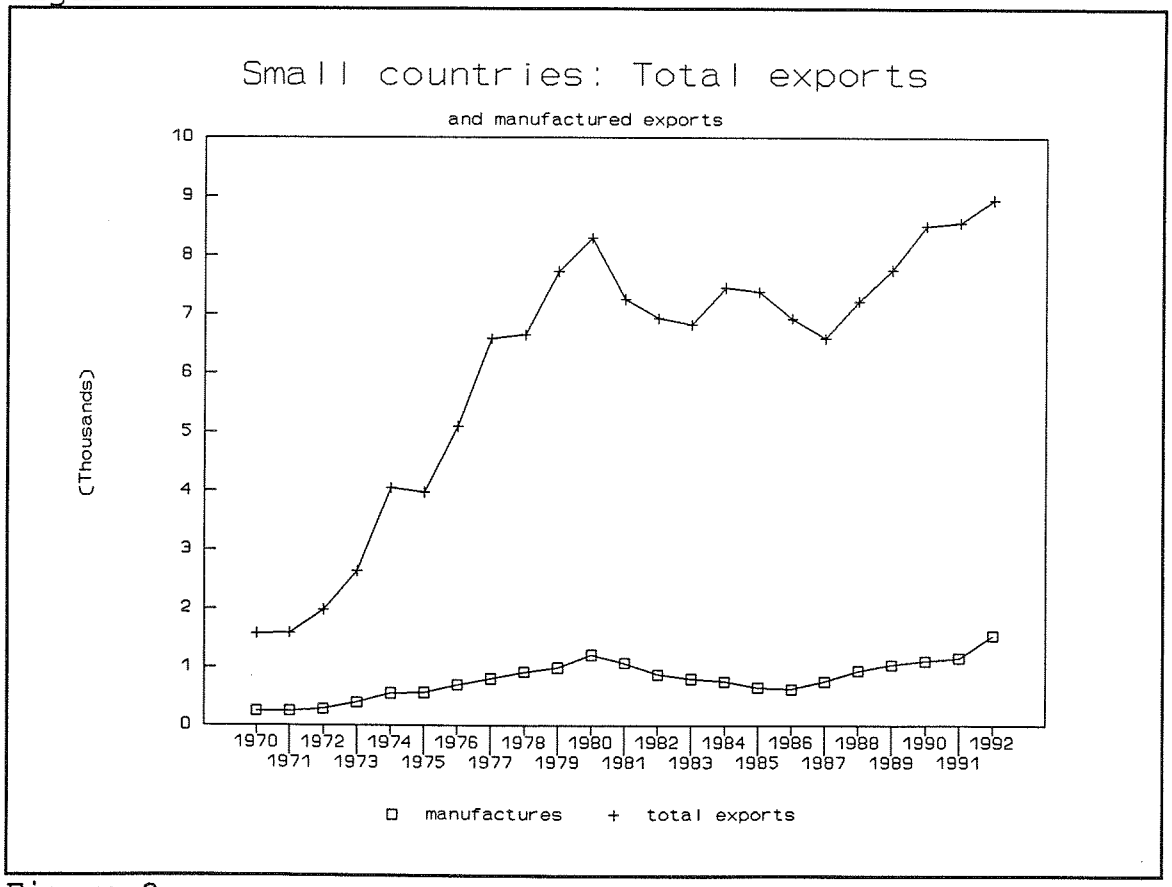

Figure 2.

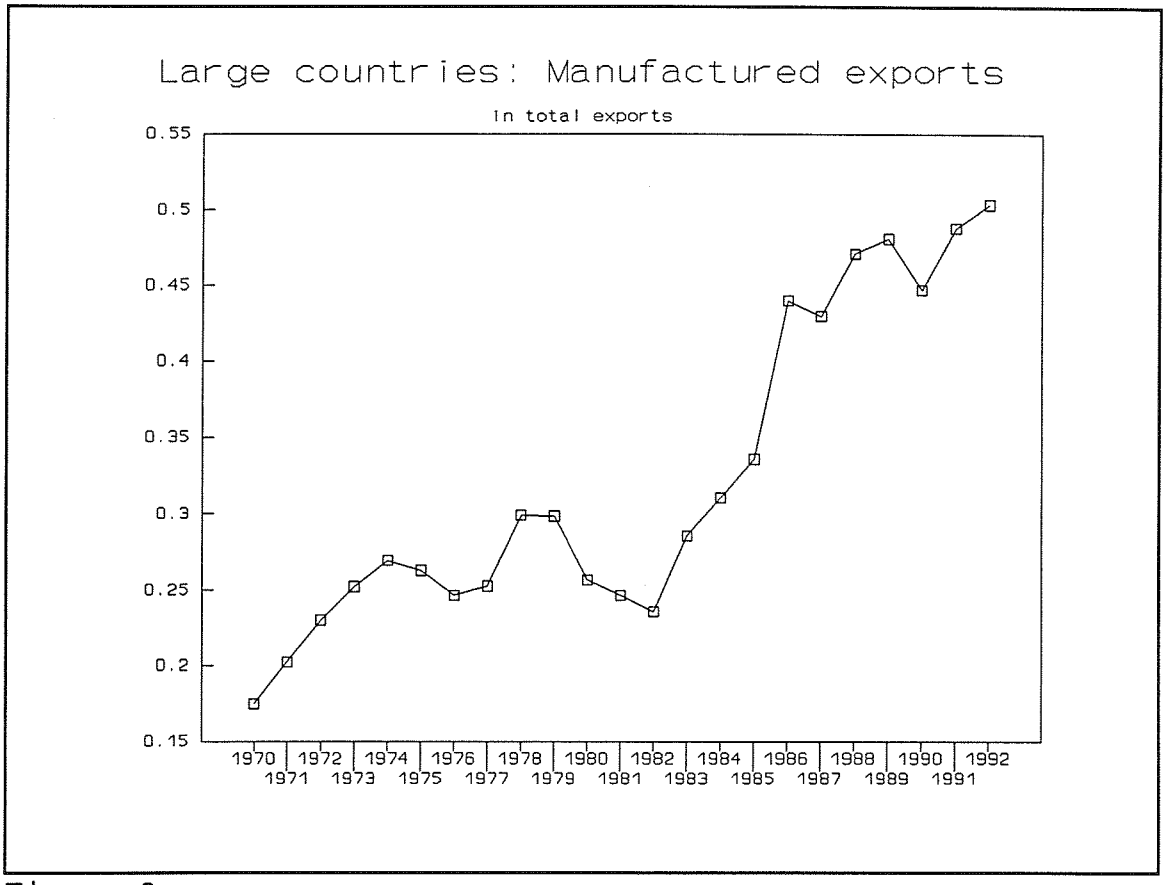

Figure 3.

Figure 4.

until 1986. Apparently, the regional recession hampered these exports, which shows that these countries, by and large, did not achieve a redirection of their exports to markets outside the region.

Figures 3 and 4 show the *share* of manufactured exports in total exports of large and small countries, respectively. This brings out the picture even more clearly. In small countries, the share of manufactured exports declined at the end of the 1970s when prices of primary goods were booming. This was much less so in large countries. The difference between the two groups is most striking for the early 1980s: between 1980 and 1986, the share of manufactured goods in exports from large countries increased from 25% to 44%; it decreased from 14% to 9% for small countries. For the small countries, it recovered after 1986 and achieved a (slightly) higher level than in 1970 in the latest year for which data are available, 1992. Note also that the share of manufacturing goods in total exports was almost equal for the two groups in 1970: 17 and 16 percent, respectively. In 1992 the figures were 50 and 17 percent, respectively.

In order to examine whether large countries experienced more dynamic effects, we also looked at some specific sectors within manufactured exports. A first sector is that of skill-intensive exports. Skill-intensive exports are defined as SITC sectors 51-59, 69, 71-73 and 86. This is in keeping with classifications used by other authors (Amsden 1980, Buitelaar and Fuentes 1991). Ultimately, they are based on the use of skilled labour, by sector, in the US economy (Hufbauer 1970). A smaller subsector is that of high-technology industrial products. It is composed of 71-73 and 86, including electrical and non-electrical machinery, transport materials and instruments.

Figures 5 and 6 show the share of these two sub-sectors of manufactured exports in total manufactured exports for large and small countries, respectively. A first observation is that the share of these sub-sectors increased sharply in the early 1970s for large countries (figure 5). This holds especially for high-tech exports. In that period, these countries seem to have built the basis for their competitive advantage which they could maintain in later years during the debt and adjustment crisis. Between 1975 and 1988, the movement in both shares is erratic, but as of 1988 there is a clear increasing trend, with high-tech exports doing even better than skilled exports.

For small countries, there was not such a sharp increase in the share of these sub-sectors in the early 1970s, although there is some increase in skilled exports (which points to a relative increase in ISTC 51-59, chemical manufactures). Between 1975 and 1986 both shares were stagnant. After 1986, a decline can be observed although there is some recovery in the period 1990-1992. The share of skilled manufactured exports in total exports is at the same level in 1992 as it was in 1970, while there is a clear increase for large countries.

These results confirm the conclusion that the large Latin American countries have benefitted more from dynamic efficiency effects related to increased world market integration than small countries.

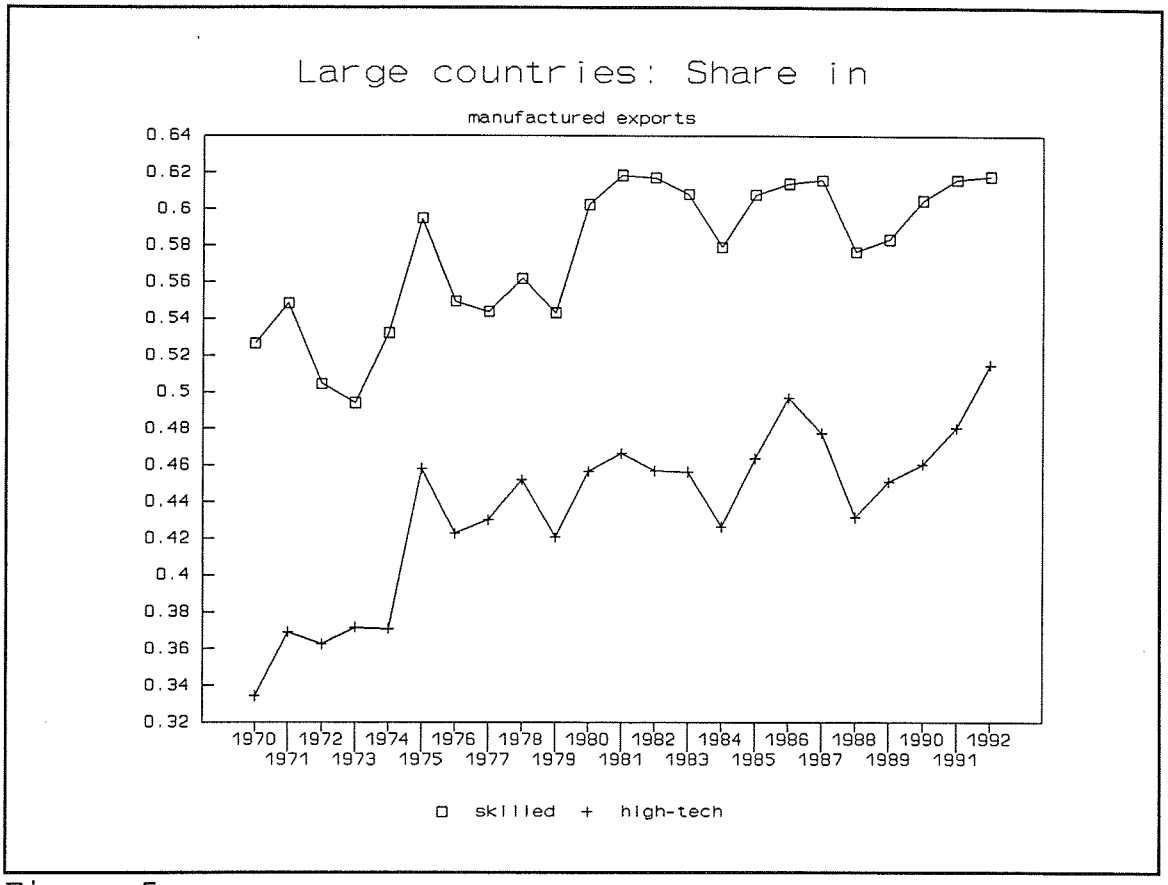

Figure 5.

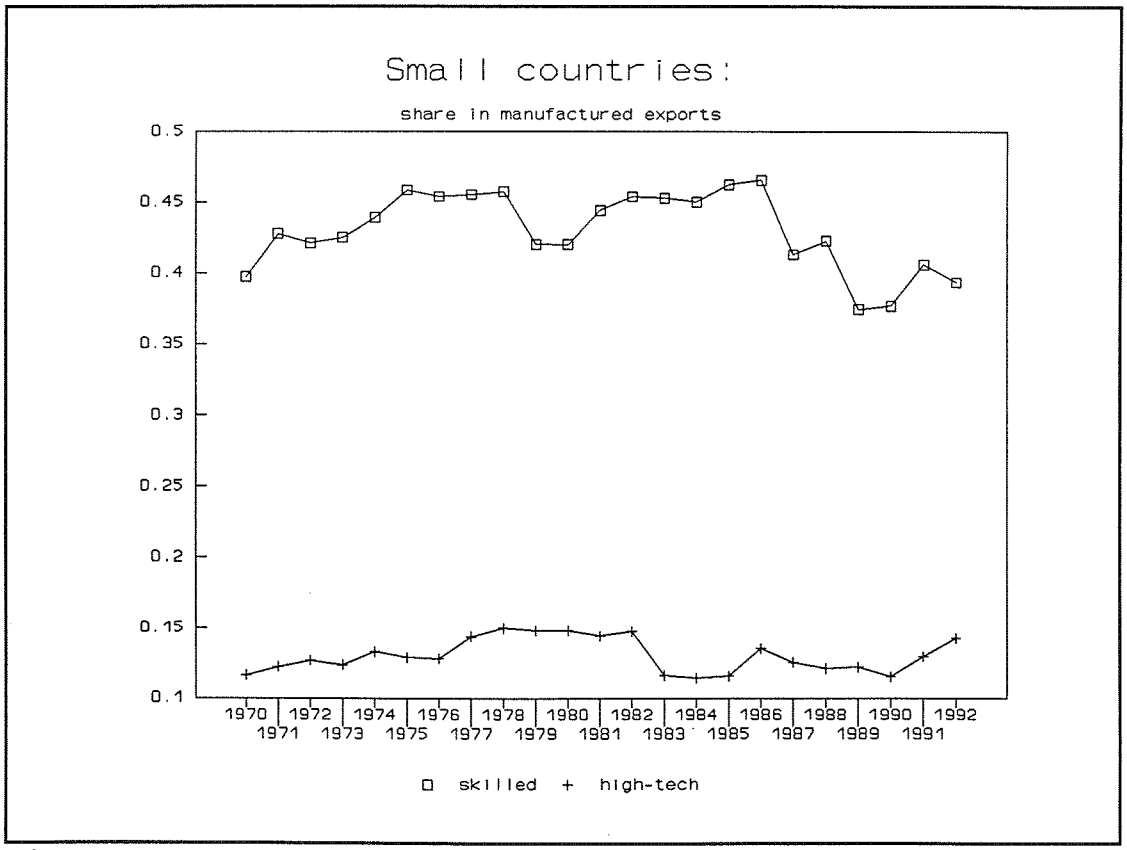

Figure 6.

6. CONCLUSION

Trade liberalization can be expected to have different effects on efficiency in manufacturing in the short term and in the long term. In the short term, there are positive effects on allocative efficiency. For X-efficiency, there may be short term positive effects as well. This depends on whether access to inputs improves, and/or on the relative importance of substitution and income effects for firms (or firm managers) in import competing and exporting sectors and on the relative importance of these sectors themselves. However, these (eventual) short-term positive effects (X-efficiency and allocative efficiency) are hampered if there is oligopolistic competition in the domestic market, be it in production or in trade. If domestic markets allow for changes in relative prices to occur and if other supportive factors are available, allocative efficiency will generally improve from trade liberalization. Allocative efficiency effects are larger for small countries than for large countries. However, the potential adjustment costs are also larger so welfare may decrease in the short run.

Dynamic efficiency effects will occur in countries that already have a firm industrial base or that are far ahead in the process of getting it. Otherwise, the reallocation of resources in keeping with static comparative advantage that results from trade liberalization will lower their long-term growth prospects. This is the result of a lower income elasticity of demand for these goods and/or a lower potential for internal and external economies of scale, learning effects, and R & D investment. In sum, countries that do not have this industrial base are expected to miss out on these long-run effects.

The evidence on indicators for X-efficiency, allocative efficiency and dynamic efficiency for Latin America provides some interesting conclusions. The short-term effects of trade liberalization on labour productivity in manufacturing were always positive (Chile, Mesico, Bolivia), but the relationship was weak and other factors were probably more important for explaining productivity growth. Trade liberalization also proved to lead to intensive restructuring, in particular, within manufacturing. Most evidence is here based on the Chilean experience. It was clear that there were strong negative allocative efficiency effects for Chilean manufacturing, especially in the first period (1974-1979). Competition from imports led to a decline in most branches. Later, in the 1980s, natural resource based manufacturing began to grow but this happened after specific export promoting measures were taken. Apparently, the market did not work well in this respect, which may be partly due to the oligopolistic structure of the Chilean economy.

Long-term positive effects of trade liberalization on manufacturing productivity could not be established (Chile, Bolivia). In addition, manufacturing production declined overall and R & D expenditure in Latin America was reduced in the 1980s while it already started from a low level. Even countries like Argentina and Mexico had difficulties in maintaining the share of capital goods production in total manufacturing production. Manufactured exports from Chile had a lower skill and technology intensity, and most manufactured exports from eight small and medium countries went to stagnant markets.

For sixteen Latin American countries I analyzed the developments in manufactured exports between 1970 and 1992 in more detail. Regressing the growth rate of manufactured exports for 16 Latin American countries, I concluded that only the size of the domestic market (measured by GNP) proved to be a robust and significant variable. In this period of increased world market integration (testified by increased exports for both groups of countries), large countries proved to have a higher growth rate of manufactured exports than small countries.

Looking at the development of manufactured exports in more detail, we showed that large countries increased their share of manufactured exports in total exports considerably, while this share stagnated for small countries if the whole period is considered. The same holds for the shares of skilled manufactured exports and high-technology exports in total manufactured exports. This means that large countries benefitted much more from dynamic efficiency effects than small countries. Small countries may have benefitted more from allocative efficiency effects, but this resulted in their continued dependence on exports of primary goods or of manufactured exports in which low skills are involved.

From a development perspective, long-run aspects are more important than short-run effects. For this reason, it is important that all countries establish an industrial base that benefits from internal and external economies of scale and in which learning effects play a role. Given the developments in the world trading system, high tariff walls can no longer be considered a suitable policy. Instead, more effective and more specific industrial policies are necessary to complement gradual policies of trade liberalization (see Agosín and Ffrench-Davis 1993, Lall 1995, Pietrobelli 1994).

NOTES

1. In spite of the creed that structural adjustment is about liberalizing markets, Toye (1994) found that removing import quota was included in only 57% of structural adjustment programmes, while improving export incentives was included in 76% of these programmes.

2. Measured as deviations from an estimated frontier production function (as explained Marshall 1992, 211-223).

3. For Peru, demand and the institutional setting of firms proved the most important factors in explaining productivity growth (Cortez 1997).

4. A problem with these results is that the Durbin-Watson statistic is low in all cases.

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Appendix Table. Regressing the growth rate 1970-1992 of manufactured exports of 16 Latin American countries.[1]

Dep. var.	lgnp	prim.edu[2]	man/gdp	lgnp/c	impgr	lr&d	R^2
1	**0.016**						0.35
2		**0.123**					-0.22
3			**0.630**				-0.10
4				**0.021**			-0.07
5					**4.261**		-3.13
6						**-0.063**	-1.43
7	**0.012**	0.035					0.43
8	**0.030**			-0.019			0.43
9			0.038	0.020			0.07
10	**0.030**	**0.060**	**-0.837**				0.67
11	**0.038**		-0.446	-0.014			0.50
12	**0.032**	**0.053**		**-0.030**			0.60
13		0.049	-0.102	0.017			0.20
14	**0.029**		-0.511		-0.337		0.46
15	**0.013**	0.036				0.006	0.44
16	**0.013**	0.042			-0.882		0.48
17	**0.045**	**0.073**	**-0.750**	**-0.025**			0.78
18	**0.030**	**0.066**	**-0.819**		-0.778		0.71
19	**0.032**	**0.063**	**-0.877**			0.010	0.70
20	**0.014**	0.043			-0.849	0.004	0.48
21	**0.044**	**0.074**	**-0.750**	-0.023	-0.317		0.79

[1] Coefficients in bold are significant at the 5% level.

[2] Primary education raised to 4th power, coefficient multiplied by 100 * 10^6.