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Working Paper

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Department of Economics Discussion Paper, No. 00,12

Provided in Cooperation with:
University of Kent, School of Economics

Suggested Citation: Santos-Paulino, Amelia U. (2000) : Trade liberalisation and export performance in selected developing countries, Department of Economics Discussion Paper, No. 00,12, University of Kent, Department of Economics, Canterbury

This Version is available at:
https://hdl.handle.net/10419/68060

ISSN 1466-0814

TRADE LIBERALISATION AND EXPORT PERFORMANCE IN SELECTED DEVELOPING COUNTRIES

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November 2000

Abstract

This paper examines the impact of trade liberalisation on export growth for a sample of developing economies using the export demand function approach. The research applies dynamic panel data models based on fixed-effects and generalised methods of moments (GMM) estimators. In addition, heterogeneous panels for the complete sample, as well as for different regions, are estimated using a time-series/cross-section technique. The main findings are that exports react negatively to an increase in relative prices, and positively to world income growth. Furthermore, export duties have a detrimental effect on export growth, though the impact is relatively small, while trade liberalisation emerges as a significant positive determinant of export performance.

JEL Classification: C21, E21, F14, F13, F41

Keywords: trade liberalisation, export growth, dynamic panel data, time-series/cross-section, developing countries.

Acknowledgements: I particularly thank Tony Thirlwall for his encouraging comments on different versions of the paper. I am also indebted to Alessandra Guariglia, Andy Dickerson, Miguel León-Ledesma, and Owen O'Donnell for invaluable and helpful discussions. I also thank Alan Carruth, Joao Faria, José R. Sánchez-Fung, and seminar participants at the University of Kent. The usual disclaimer applies.

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1. Introduction

The association between trade liberalisation and growth has been central in recent economic research, especially for developing countries[1]. This debate has put particular emphasis on the export growth/economic growth relationship, since export promotion strategies seem to have constituted a superior development policy for most developing countries[2]. The main benefits from higher export growth are the positive externalities which result from greater competition in world markets, that is, greater efficiency in resource allocation, economies of scale, and technological spillovers.

Recent developments in the trade policy literature focus on the potential dynamic effects of trade liberalisation in reducing rent-seeking behaviour and in accelerating the flow of technical knowledge from the world market. The benefits are derived from the greater access to new capital and intermediate goods, and also due to greater knowledge leading to faster imitation of advanced techniques (Romer, 1994; Grossman and Helpman, 1995).

In the case of the links between trade liberalisation and exports, the basis for the analysis is the hypothesis that trade liberalisation reduces anti-export bias and makes exports

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[1] Rodrik (1992) discusses the limits of trade reforms in developing countries. See also Rodríguez and Rodrik (2000), Harrison and Hanson (1999), and Thirlwall (2000).

[2] Various comparative studies analyse the impact of trade liberalisation on economic growth and exports (see Little *et al*, 1970; Balassa, 1978, 1982, 1985; Bhagwati, 1978; Krueger, 1978; World Bank, 1987; and, Michaely *et al*, 1991). Edwards' (1993) survey presents a detailed account of the studies on export growth and economic growth, as well as the literature on trade liberalisation and growth. Greenaway and Sapsford (1993, 1994) also provide empirical evidence regarding the links between trade liberalisation, exports and economic growth in a growth accounting framework.

(especially non-traditional ones) more competitive in international markets, mainly by reducing exchange rate distortions and export duties.

There are many studies based on the orthodox supply tradition which explain the impact of trade liberalisation on export growth in developing countries. Some such investigations confirm that the countries that embarked on liberalisation programmes have improved their export performance (Thomas *et al*, 1991; Weiss, 1992; Joshi and Little; 1996; Helleiner, 1994; and Ahmed, 2000). On the other hand, other researchers have found little evidence to uphold the relationship between trade liberalisation and export growth (see UNCTAD, 1989; Agosín, 1991; Clarke and Kirkpatrick, 1992; Greenaway and Sapsford, 1994; Shafaeddin, 1994; and Jenkins, 1996).

The objective of this paper is to examine the impact of trade liberalisation on export performance for a sample of developing economies. This study differs from previous investigations in that it analyses the impact of trade reforms using export demand function theory. Furthermore, given the contrasting evidence provided by the time-series and cross-section studies regarding the link between trade liberalisation and export growth, this research will assess the relationship empirically by utilising panel data. Additionally, a detailed evaluation of the evolution of trade policy is provided, which helps to establish the exact dates of reform and the main features of trade policy in the cases considered. This evidence is used in the empirical analysis to explain the effects of distortions and liberalisation on export growth.

The rest of the research is organised as follows. Section 2 presents a review of trade policy reforms in the countries analysed in this study. The theoretical background of export demand functions is explained in section 3. In section 4 the empirical analysis is undertaken. Section 5 concludes.

2. Evolution of Trade Policy Reforms in Selected Developing Countries

One of the most recurrent arguments for trade policy reform in developing countries was the debt crisis unleashed in the early 1980s. The World Bank and the IMF began to recommend development strategies based on market oriented reforms, which included as a basic component the reduction of trade barriers and the opening of international trade to foreign competition (among other long-term growth and development strategies)[3]. The membership and commitments to the World Trade Organisation (WTO) (formerly General Agreement on Tariffs and Trade, GATT) has also been an important determinant of trade reforms in developing countries. Furthermore, the change in intellectual thinking regarding the virtues of a more outward-oriented economy, and the failures of protectionist policies in some developing countries, were crucial factors behind trade policy reform (see Krueger, 1998).

Trade liberalisation, specifically the impact of openness on economic performance, has been widely studied. Some studies have tried to assess the credibility of trade liberalisation attempts because of the lack of reliability of reforms, particularly in the case of some African countries in which the liberalisation measures were reversed for various reasons[4]. Although most developing countries have made significant progress towards liberalisation, the progress has been uneven and different.

There are some common elements that can be regarded as characteristic of developing countries prior to trade liberalisation. They are:

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[3] The most relevant programmes are the IMF's Structural Adjustment Facility (SAF) and its successor the Enhanced Structural Adjustment Facility (ESAF). By the end of 1994, 36 countries had drawn on the ESAF, in support of 68-multiyear programs - see IMF (1998), and Bredenkamp and Schadler (1999).

[4] Oyejide *et al* (1999) define trade liberalisation episodes in a selection of African countries in terms of specific measures, that is, changes in policy and observed changes in prices and quantities.

- Import substitution industrialisation (ISI) strategy, and its intrinsic policies: high tariff barriers, import controls, credit and exchange rate subsidies to ISI industries, protection of specific commodities via complex tariff structures.
- Tariffs as the main source of fiscal revenues.
- The use of import tariffs and exchange rate controls, mainly to cope with balance of payments crises during the 1970s and 1980s, where external negative shocks resulted in the fall of commodity prices, a reduction of aid flows and general world recession. Also, exchange controls were used to preserve fixed exchange rates.
- The coexistence of an anti-export bias and export-promotion, mostly in the form of infant industry protection of the manufacturing sector, overvalued exchange rates, tax and credit concessions, etc.

Regarding export policies reforms, the main instruments used to promote export growth and diversification have been adjustment to exchange rates and producer prices and tariff reforms to reduce the anti-export bias in the structure of import protection. In countries with extensive foreign exchange distortions (e.g. exchange controls and multiple exchange rates), foreign exchange retention schemes for exporters were sometimes introduced, and, in some cases, special licenses (to import inputs) and duty drawback schemes were provided to exporters. The export promotion schemes mentioned above have not effectively addressed the anti-export bias facing export industries in restrictive systems and have proved difficult to administer. Nevertheless, almost all the cases, export duty reductions or elimination were undertaken as an export promoting measure, as can be observed in Table 1.

<<Table 1 about here>>

In general, trade liberalisation has been considered a more efficient instrument for promoting export diversification and growth than some of the earlier schemes used for this

purpose. These include export subsidies for non-traditional exports (e.g. cash subsidies and income rebates, which were common in Latin America, or duty relief schemes that have helped a large range of exports in South Asia). However, these schemes have not generally been successful because such countries did not reduce their reliance on traditional exports during the 1960s and 1970s. In the last two decades, export-processing zones have been set up in a large range of countries to enable certain export production to avoid domestic taxes and restrictions altogether.

2.1 Regional Experiences

Trade reforms in developing countries have tended to be gradual, and they have helped to progressively increase the range of sectors subject to import competition. A key feature of the most recent reforms is that they are an integral part of macroeconomic and structural reforms, often supported by multilateral institutions[5]. Table A1 presents a summary of the main trade policy reforms and export promotion measures undertaken in the countries analysed in this study.

Africa

Trade policy in Africa has had the same features and effects as in other developing regions. Considering that the excessive degree of trade restrictions have been a serious obstacle to exports in the past, trade policy reforms were expected to result in significant improvements in the external trade performance of the region[6]. However, Africa's economic

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[5] Of the countries in our sample, only Indonesia, India and Malaysia did not have trade liberalisation supported by programmes with the IMF or World Bank adjustment loans.

[6] Sachs and Warner (1997) and Collier and Gunning (1999) provide insights about the main factors affecting African economic performance (the need for social capital, the lack of openness to international trade, and insufficient financial depth being the most relevant).

and political conditions - poor infrastructure, geography (affecting mainly land-locked least developed countries - LDCs), and dependence on a limited number of primary products - may well affect trade performance to the same, or even greater, extent than trade policy barriers[7].

During the 1960s and 1970s many African countries followed an inward-looking development strategy, based on state intervention in the economy. Exports were concentrated on a few primary commodities, while manufacturing activities were held back by deficient infrastructure, underdeveloped financial markets, and poor human capital resources.

One of the main reasons African countries began trade liberalisation was the accessibility to external finance and the imposition of structural adjustment programs. The different experiences of trade liberalisation episodes vary from one country to another because of the different economic, social and political contexts, as well as the correlation with other types of reforms implemented. The reform packages typically included: import liberalisation through tariff reduction or tariff structure unification, reduction of duty rates, and removal of non-tariff barriers (mainly import licensing). Export liberalisation consisted of the reduction of export duties and simplification of the administrative procedures for exporting. Payments liberalisation was linked to the elimination of exchange rate controls. Prices and market regulations were also widely abolished.

Additionally, there were short run reforms, undertaken mainly as a response to the effects of the second oil shock of 1979-80, and afterwards they were reversed. Some countries established more restrictions than in the pre-liberalisation periods.

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[7] Onafoura and Owoye (1998) indicate that trade policies, exports and investment rate shocks have a significant impact on economic growth in some Sub-Saharan African (SSA) countries. The results further suggest the need for African countries to embark on trade liberalisation policies in order to enhance economic growth. Also, Rodrik (1997) analyses the role of trade policy in achieving sustained long-term growth in SSA. According to the study, the effects of trade policy on economic growth seem to be indirect and more moderate.

To give some examples, the exports of the African Financial Community (CFA) or Franc-Zone, members (e.g. **Cameroon)** experienced a significant loss in competitiveness up to 1994, as the franc appreciated against the dollar. This was reinforced by substantial real depreciations by African competitors, and by the fall in commodity prices. In addition, the process of regional integration served as an encouragement for restructuring trade regimes, mainly in the form of preferential trade agreements between the members of the schemes. The trade agreements include Southern African Custom Unions (SACU) and the Preferential Trade Area for Eastern and Southern African States (PTA) - which in December 1994 was converted into COMESA (Common Market for Eastern and Southern Africa)[8].

Malawi, one of the members of COMESA, implemented policy measures for promoting foreign trade through the period 1981-99, mostly under the influence of three Structural Adjustment Loans from the IMF. The main objectives of the reform were the liberalisation of imports to promote efficiency and export expansion (UNDP/UNCTAD, 1999). Regional and bilateral trade agreements were also important for the liberalisation of foreign trade. However, the lack of competitive environment and inappropriate trade and investment laws might have stopped Malawi from fully experiencing the dynamic benefits expected from economic liberalisation.

As in the case of other countries, **Morocco** carried out a trade liberalisation programme unilaterally, encouraged by economic difficulties, namely macroeconomic crises and balance of payment difficulties. The process of reform started in 1983 and continue to be developed during the period 1990-94 (WTO, 1996). The main reforms consisted of reducing import

[8] The members of COMESA are: Angola, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe.

duties, abolishing import licensing, reducing exchange rate policy distortions, and arranging a more favourable administrative environment.

In the case of **Tunisia**, the promotion of exports has been a decisive factor for improving economic growth and external payments, as part of the trade reform started in 1987. Imports have been liberalised to promote the vitality of domestic production, to strengthen competition, and thereby to increase the economy's efficiency. This programme continued in 1996; it was also extended to a number of agricultural products. With respect to trade co-operation, agreements have been signed or revived to stimulate trade, particularly with Morocco, Algeria and Egypt. The liberalisation of the Telecommunications sector under WTO signatory commitments has played an important role in Tunisia's economic development. At the same time, other factors – privatisation in other sectors and macroeconomic stabilisation resulting from the World Bank Structural Adjustment Loan Program – have also shown themselves to be important contributors to economic expansion (see Central Bank of Tunisia, 1996).

Zambia is a land-locked LDC, which passed from being one of the richest countries in Africa to one of the poorest[9]. There were two liberalisation periods, first from 1983 to 1987, and the second from 1989 onwards. Although co-ordination failures and policy reversals[10]

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[9] The factors that prompted the economic crisis were the downturn in international commodity prices (mainly copper) in the 1970s, and external indebtedness. The adverse external shocks were reflected in a remarkable fall in Zambia's terms of trade, which was more dramatic than in other sub-Saharan African economies. The economy has also suffered as a consequence of military and political conflicts in the region. As a land-locked country, the transport costs for Zambia's copper exports were affected by the wars in Rhodesia, Angola and Mozambique.

[10] The policy reversal started on May 1 1987, when the *New Economic Reform Programme* was announced. One of the most dramatic measures was the suspension of financial relations with the IMF. These measures affected the trade regime and the reforms undertaken in the previous period. The second episode of trade liberalisation started in 1989. By the end of 1989, general economic conditions had deteriorated enormously. The government was pressed to renew negotiations with the IMF and the World Bank group, and a new orthodox reform program was introduced in which the liberalisation policies consisted of the re-establishment of the measures implemented in the first liberalisation attempt.

covered the first attempt of liberalisation, the reform package had some remarkable outcomes. Import liberalisation (i.e. tariff and administrative barriers) and the stimulation of the non-traditional export sector were the chief measures undertaken (Musonda and Adam, 1999). Zambia also experienced substantial improvements in terms of deregulation in other areas of the economy. The government decontrolled prices, privatised many state companies and abolished exchange rate controls. Also, Zambia's market access obligations under the General Agreement on Trade in Services (GATS) include services related to mining and exploitation, professional services and tourism-related services. Zambia is affiliated to the Southern African Development Community (SADC) and COMESA.

In general, there is concern regarding whether reform efforts in Africa (mainly in the LDCs) will be sustained without the pressure imposed by the adjustment programmes. This apprehension is based on the fact that trade liberalisation episodes were not always sustained.

South Asia

In the mid-1980s, all South Asian countries still protected their import-competing sectors with very high tariffs. India and Pakistan had the highest duties. India's basic rates ranged up to 335 percent, and luxury goods in Pakistan faced rates as high as 450 percent (see Dean *et al*, 1994). During 1980-85, all countries experienced current account deficits. In many cases (except India) inflation rates were above 10 percent and there was a loss of foreign reserves. Real GDP growth declined mainly in Sri Lanka, but remained fairly high in India and Pakistan. Foreign exchange markets were highly restricted. As recipients of adjustment loans to cope with these macroeconomic imbalances, all countries entered into significant "liberalisation" programmes after 1985.

India is an example of dualism in the trade policy prior to reform, whereas measures against exports and to encourage exports were introduced simultaneously. In 1989 the duty

drawback compensation scheme for exporters was introduced. Between March 1990 and March 1993 restrictions on manufactured exports were virtually removed. However, over half of the remaining controls are on agricultural exports, and many of these act as significant impediments.

In **Pakistan** there has been some liberalisation of raw material and intermediate goods imports for export industries. However, high export taxes still remain as they were in 1992, mainly on agricultural commodities such as cotton.

Sri Lanka had replaced almost all quantitative restrictions (QR) with tariffs in 1977, and in 1985 had no bans, quotas, or domestic content requirements. However, a small number of goods still faced licensing requirements. The focus of the trade reform was explicit elimination of these taxes, especially for non-traditional exports.

Concerning export policies, South Asian countries maintained significant export taxes prior to reform. Despite the differences in the levels of duties, the countries made efforts to increase incentives to exporters. These incentives commonly took the form of establishing or expanding the duty drawback system, implementing tax holidays for exporters, simplifying direct subsidy schemes and/or paying tax rebates. Additionally, in most cases, direct controls on imported intermediate goods for use in export production were reduced. Another motivation for export policy reforms was to neutralise the effects of remaining import barriers.

East Asia

Most of the East Asian countries had already made a serious commitment to trade liberalisation before the mid-1980s. By 1985, Malaysia had removed most QRs and was in a phase of completing comprehensive trade reform. Thailand had been simultaneously

promoting import-substituting and export-oriented industries since the early 1970s, but in the mid-1980s moved towards the orientation of policy in favour of export promotion.

Indonesia has a long history of failed import substitution industrialisation, but the collapse of oil and other commodity prices in the early 1980s motivated a sweeping liberalisation of trade policy, reinforced by deregulation of financial markets and rules governing domestic and foreign investment. In the movement from an inward to an outward looking development strategy, one of the most important export measures was the promotion of non-traditional exports. Indonesia, as Malaysia, uses trade measures as an environmental device[11]. The trade reforms that were undertaken after 1986 have been supported by an exchange rate policy, which has improved and protected Indonesia's competitiveness in the world.

In **Korea,** strong economic growth, trade liberalisation, internal deregulation, and relaxation of foreign investment restrictions have helped to enhance the competitiveness of the country (WTO, 1996). Simplifications of export procedures and commitments with the WTO rules are also important aspects of Korea's trade reforms. As in the other successful East Asian economies, Korea's economic strength is based mainly on industrial specialisation and the resulting economies of scale (under stable external conditions). Assistance is extended in the form of tax breaks and concessional interest rates, mainly to agricultural and coal mining sectors. However, the Korean economy was affected by the difficulties of some of the major conglomerates and financial institutions, which were worsened by the financial crisis which swept through Asia in July 1997. On December 3 1997, Korea and the IMF reached an

[11] In the forestry sector, export taxes on logs (set at prohibitive levels) and on sawnwood have been used to stimulate the output of more processed wood products.

agreement on a financial aid programme[12]. Although the trade policy regime was not considered responsible for the recent financial crises, the IMF recommended the revision of trade policy instruments. Measures such as the elimination of a variety of export subsidies, including reserves for export losses or exporters; reserves for exporters' overseas market development; tax incentives for foreign investment were applied, amongst other specific measures. Later, Korea completed a plan to review all existing subsidy programs and their economic rationale. Moreover, exports helped to minimise the effects of the financial crisis by helping to maintain the existing level of employment.

Malaysia has a relatively low tariff average (around 14 percent) and very few QRs. It also maintains a liberal exchange rate system. Inflows of funds are completely free, while outflows face only limited restrictions. Between 1988 and 1992 tariff reductions were made, especially on items including food, household goods, clothing, electrical and electronic goods. Although Malaysia has few import quotas, it does practice import licensing, mainly for purposes of maintaining health, safety and environmental standards[13].

The **Philippines** provides an example of trade policy reversal. The process of trade liberalisation was abandoned in 1983 as a consequence of severe macroeconomic problems and the debt crisis, generating balance of payments difficulties. Conversely, in 1986 a successful liberalisation programme was undertaken, which consisted of an Import Liberalisation Programme (ILP). Tariff reform can be characterised as moderate, gradual and steady. In spite of import liberalisation and tariff reforms, the export sector remains

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[12] The package totalled US$58.35 billion that included loans worth US$21 billion from the IMF, US$14 billion from the World Bank and the Asian Development Bank, and US$23.35 billion from the G-7 and other countries.

[13] In the last decade Malaysia has implemented several trade measures aimed at conserving its forest resources, including a ban on log exports in 1985, and the imposition of export levies on sawn timber and veneer in 1990. In addition, raw rattan exports from peninsular Malaysia were banned in 1989.

disadvantaged by the trade regime. However, export-oriented foreign direct investment has increased significantly, mainly due to a 1987 reform of foreign investment laws which removed the previous biases against foreign investment in labour-intensive, export oriented activities.

In **Thailand**, export promotion measures were part of a broader strategy of reducing government regulation of business activity and promoting private sector development. The currency appreciated in nominal and real terms in the early 1980s along with the US dollar to which it was loosely tied. In 1984, as part of an attempt to adopt a more flexible exchange rate policy, the Thai baht was devalued against the US$ by 14 percent. The currency continued to depreciate in both nominal and real terms more gradually. As a result, Thailand's international competitiveness improved substantially in the second half of the 1980s, which had the additional effect of attracting a massive inflow of FDI, mainly from Hong Kong and Taiwan.

Overall, trade policy in East Asia became more liberal from the mid-1980s onwards. All countries have moved to more outward-oriented trade regimes, although the character and pace of reforms differed from country to country, reflecting the differences in the levels of development, in the progress made in trade reform in earlier years, and in macroeconomic circumstances. Despite these differences, a common pattern in the sequencing of reform does emerge from the East Asian experience. The first phase of trade policy reform in all the countries was one of removing the obstacles to exporting, which typically involved unifying and devaluing the exchange rate and removing QRs on imports of intermediate and capital goods. Additionally, during this phase direct inducements to exporting were generally provided in the form of duty drawback schemes and preferential export financing. The second phase, during which the remaining QRs were largely eliminated and tariffs began to be gradually reduced, generally commenced only after the balance of payments was strengthened. In cases where external payments or the government budget balance

subsequently deteriorated (as in the Philippines and Thailand) the second phase reforms were put on hold.

Latin America

In Latin America almost all of the largest countries have, or are committed to, open (or relatively open) trade systems, which contrast with the strong inward orientation policies prevailing in the 1960s, 1970s and, in some cases, early 1980s. The liberalisation policies have been characterised by a rapid elimination of QRs, and significant subsequent reductions in tariffs to low and uniform levels. All the countries analysed in this paper faced significant debt problems in the early part of the 1980s, except Venezuela, whose problems emerged after 1986. Persistent current account deficits were present in almost all countries (excluding Venezuela). Mexico faced high inflation at the beginning of the 1980s, and Chile, Costa Rica, Mexico and Venezuela suffered severe economic decline.

In contrast with the rest of Latin America, **Chile** had uniform tariffs in 1985, virtually no QRs, and did not impose foreign exchange restrictions. Additionally, Chile moved to a relatively low uniform tariff (10 percent) under GATT commitments, although this tariff was raised in response to the 1982 slowdown. Nogués and Gulati (1992) argue that Chile's export success has been due to the openness of its import regime and significant real devaluation of the currency. They also claim that the export incentive measures were put in place at a time when export growth was already rapid, and consider their effects to be minimal compared to the impact of changes in the exchange rate and import regime.

Regional integration has played an important role in the trade liberalisation process of Latin American countries. Under a **Costa Rica**-led initiative in the mid 1980s, the Central American Common Market (CACM) countries agreed to introduce a revised trade regime which included the elimination of specific rate tariffs with a switch to ad-valorem rates,

among other measures. This agreement led to a reduction in average tariff rates as well as a decrease in the dispersion of rates in Costa Rica.

The **Dominican Republic (DR)** undertook the most recent trade reforms in 1990 under the New Economic Programme, as a result of the most severe macroeconomic crisis evidenced in the history of the country (see IMF, 1999). Whilst significant progress has been made toward a more open trade regime, particularly through the elimination of non-tariff barriers, tariff rates remain relatively high when compared with regional trading partners. However, the relatively protectionist trade regime of the DR has been offset by an extensive network of free-trade zones, which have become the primary source of the strong export performance during the last decade. There is a proposed tariff reform still pending in Congress, and the DR is moving toward further liberalisation inspired by regional trade agreements which will lead to a harmonisation of its trade policy with its neighbouring countries.

Ecuador has also established free trade areas with Colombia (1992), Chile, and within the Andean Community. It has also agreed, as member of the Andean Community, to liberalise trade with The Southern Cone Common Market (MERCOSUR)[14] by the year 2000 and fully supports a Free Trade Area of the Americas by 2005.

In **Mexico**, although the trade liberalisation programme was part of a broader growth-oriented stabilisation and adjustment programme, another factor that helped the reform commitment was the affiliation to the GATT in 1986. Also, Mexico signed free trade agreements with Guatemala in 1989, Chile in 1991 and the North America Free Trade Agreement (NAFTA) with United States and Canada in 1992. Trade reform was also complemented by changes in the foreign exchange regime. By 1985, a system of managed

[14] The country associates are Argentina, Brazil, Paraguay and Uruguay.

floating of the peso came into effect, with a substantial depreciation of the real exchange rate by 1986. In 1987 the Bank of Mexico no longer intervened in the foreign exchange market and the peso was devalued so that the official and free market rates were within 1.5 percent of each other. The peso was fixed to the US$ as part of an anti-inflationary pact in 1988, and from 1989 onwards was allowed to depreciate daily against the US$. In 1991 the Bank of Mexico unified the foreign exchange markets, defined a band within which the peso was allowed to fluctuate, and reduced the daily rate of depreciation of the peso with respect to the US dollar.

Since 1989, **Paraguay** has unilaterally liberalised its trade regime. Paraguay's extensive economic and political reforms (new Constitution) have facilitated its integration into the world trading system. This process has been enhanced by the application of the WTO agreements and by the regional commitments resulting from MERCOSUR membership. Paraguay simplified the tariff structure and reduced duty rates. However, this trend will, to some extent, be reversed by progressive convergence with MERCOSUR's common external tariff (CET)[15], which will generate a small increase in the unweighted average of the most favoured nation (m.f.n.) rate from 9.6 percent in 1995 to 11.1 percent by 2006. In compliance with MERCOSUR and WTO commitments, remaining non-tariff measures which affected a few agricultural products were replaced by tariffs in January 1995. Decisions remain to be taken within MERCOSUR on duty for sugar and the establishment of a common automotive regime.

As in Paraguay's case, **Uruguay's** participation in MERCOSUR has helped to promote significant restructuring and modernisation of its economy, but as its economic performance

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[15] The tariff-reduction programme launched in 1991 by the members of MERCOSUR culminated at the end of 1994. All tariffs on trade among the MERCOSUR countries were eliminated in 1991, except for a small list of products from each country, which were to be removed in 1998 for Argentina and Brazil and 1999 for Uruguay and Paraguay.

is increasingly linked to that of its neighbours (especially Brazil and Argentina), a slowdown in the region could easily have spillover effects in Uruguay. However, the country needs to continue efforts to diversify its trading structure, to develop new products and services, and to find new export markets.

In **Venezuela,** trade policy reforms that started in 1989 were an element of an economic stabilisation program and deregulation to promote efficiency and growth. The *intent* was to enhance the simplicity, transparency, and neutrality of the trade regime. The trade reform was to take place in three phases: (1) reform of the exchange regime and commercial policy reforms in the manufacturing sector; (2) commercial policy reforms were to focus on agriculture; (3) a competitive exchange rate was to be the principal instrument of import promotion and export promotion. Between 1983 and 1988 there was a multiple exchange rate system with three rates. The lowest rate applied to debt service, petrol exports, and "essential" imports. A higher rate applied to most commercial transactions; and the free market rate (which ranged from 78 percent to 233 percent) to non-traditional exports, tourism and capital transfers. The unification of the rates in 1989 was achieved through the establishment of an interbank system with the currency trading at market prices. Foreign exchange controls were abolished. Nominal devaluation brought about a continuous depreciation of the real exchange rate for the entire duration of the reforms (Dean *et al*, 1994).

In short, the Latin American countries covered here all made dramatic and significant reforms between 1985-1993. Liberalisation took place simultaneously, in terms of import barriers, export impediments, and the foreign exchange market. Concomitant with radical removal of QRs, the countries made significant reductions in tariff barriers. Export taxes and restrictions have been reduced, while indirect support for exports has been expanded. The reforms appear to be both moves toward neutrality and increased liberality. Simultaneously, many countries expanded or introduced export incentives to counteract the effects of

remaining import barriers. Only Venezuela reduced explicit export subsidies. Also, indirect subsidy schemes were introduced (or maintained in some cases), such as duty drawback schemes, tax exemptions and/or rebates on income from exports and tariff exemptions on imported inputs used for production of exportables.

This section has analysed the main trade policy instruments which are considered to negatively affect exports. It emerged that multiple exchange rates, administrative barriers and export duties, amongst others, constitute the most significant anti-export biases in developing countries. Even though the countries surveyed undertook necessary reforms to reduce trade distortions, the extent and path of reform was diverse, and in many cases reforms are still outstanding. The issues of resistance to reforms, which are assumed to enhance economic efficiency, and the asymmetries of trade policy between export and import sectors have been studied in the literature on the political economy of trade policy. For instance, Fernandez and Rodrik (1991) show that governments often fail to adopt necessary policies because of the uncertainty regarding the distribution of gains and losses of reforms, and thus there is a bias towards the *status quo*[16]. This has been a typical problem in developing economies (where the patterns of trade policy have historically facilitated corruption and rent seeking) reflected in, for example, the promotion of one sector at the expense of others observed in the implementation of most industrial promotion strategies.

[16] See also Bhagwati (1981, 1988); Krueger (1989); Krugman (1987); Mayer and Riezman (1987); and Rodrik (1986).

3. Export Demand Functions

Broadly, export performance may be expected to depend primarily on:

1. Relative prices (the price of a country' exports relative to the foreign price of related goods expressed in a common currency);
2. World income, which determines the demand for a country's goods.

If the price elasticity and the income elasticity of demand for exports are assumed to be constant, the export function can be written as (see Thirlwall, 1999):

$$X = \left(\frac{P_d}{P_f E} \right)^{\eta} WY^{\varepsilon} \tag{1}$$

where: WY represents world income; P_d is domestic prices; P_f is foreign prices; E is the nominal exchange rate; η is the price elasticity of demand for exports; and ε is the income elasticity of demand for exports. The price elasticity of demand for exports is expected to be negative, while the income elasticity will be positive.

Taking logs of the variables in equation (1) and differentiating with respect to time, the growth of exports can be expressed as:

$$x = \eta(p_d - p_f - e) + \varepsilon(wy) \tag{2}$$

The above model assumes, implicitly, that export growth in period t equals the actual growth of exports in period t, that is, $x_t^d = x_t$. In other words, it is assumed that export growth adjusts in each period to desired rates. Alternatively, a more realistic assumption would be to test the possibility of lagged adjustment in a "disequilibrium" model of export demand, in which export growth is assumed to adjust only partially to the difference between export demand in period t and the actual growth of exports in the previous period. This yields,

$$x_t = \beta_0 + \beta_1 px + \beta_2 wy + \beta_3 x_{t-1} + \mu_t \tag{3}$$

where: $\beta_1 = \eta$; $\beta_2 = \varepsilon$ (i.e. the short run price and income elasticities); *px* is the growth in relative prices; and μ_t is the error term. The long run price and income elasticities are given by $\beta_1/(1-\beta_3)$ and $\beta_2/(1-\beta_3)$ respectively.

Export demand analysis has been applied to both industrial and developing countries (Goldstein and Khan, 1985, survey the literature related to income and price effects in foreign trade). The empirical work on the time-series behaviour of foreign trade flows has evidenced little change in the last three decades. Despite the improvements in estimation techniques, the empirical evidence suggests that there have not been changes in the sizes of the estimated elasticities over time. Beenstock and Minford (1976), Deppler and Ripley (1978), Lawrence (1978), and Goldstein and Khan (1978) provide representative estimates of short run and long run price and foreign income elasticities of standard demand for imports and exports for industrial countries. In these cases, the long run price elasticities range from -1.40 to -1.85, and the long run income elasticities presents values from 0.91 to 4.03.

Khan (1974), Goldstein and Khan (1982), and Senhadji and Montenegro (1999) estimate export demand elasticities for a large number of developing and industrial countries, using time series techniques. They find that exports do react to both the income of trade partners and relative prices, and the average long-run price and income elasticities for all countries are found to be approximately -1 and 1.5, respectively, but there is a wide diversity of experiences.

4. Export Demand Analysis for Developing Countries

The traditional export demand function provides an interesting framework in which to analyse the responsiveness of exports to price and income variations. However, there are other effects that must be considered, such as the influence of trade policy reforms on export

performance. This section analyses empirically the effect of trade liberalisation measures on export performance, and how this process affects the key arguments of the export demand function. The modelling approaches involves:

1. the estimation of dynamic panel models by fixed-effects and by generalised method of moments (GMM) (Arellano and Bond, 1998);
2. time-series/cross-section analysis for all the countries, as well as for the different geographical regions studied.

Detailed data definitions are presented in the appendix.

4.1 Empirical Modelling

According to the previous discussion, the growth of exports can be regarded mainly as a function of foreign GDP growth and relative prices, and the lagged value of export growth. In addition to these factors, this investigation aims to test the hypothesis that exports growth improves as a consequence of trade liberalisation. The ratio of export duties to total exports is used as the main indicator of the degree of distortion. The selection of such a variable was based on the fact that export duties represent one of the most widely used policy instruments in the countries analysed. Also, a liberalisation indicator defined as a dummy variable that takes the value of zero before the year of liberalisation and 1 afterwards (see Table 1 for the particular years of reform in each country) is considered.

Thus, the augmented export growth function can be expressed as:

$$x_{it} = \alpha_i + \partial_t + \beta_1 px_{it} + \beta_2 wy_{it} + \beta_3 x_{it-1} + \beta_4 d_{it} + \beta_5 lib_{it} + \varepsilon_{it} \qquad (4)$$

where α_i and ∂_t are country-specific and year-specific effects, *d* is export duties, which measure how the degree of distortions on trade can disincentive exports, and *lib* is the shift dummy variable. The rest of the variables are as defined earlier, and we expect $\beta_1 < 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 < 0$ and $\beta_5 > 0$.

There are other factors that could also explain export performance. For instance, trade liberalisation might improve the sensitivity of exports to income and price changes by stimulating efficiency and inducing structural change, for example, or making producers more responsive or making it easier for producers to shift resources. In the case of relative prices, if real exchange rate depreciations are transmitted to exporters an increased incentive to export, and if exporters are price takers in world markets, then depreciation should leave the dollar price of a unit of export unchanged, whilst shifting the supply curve outwards. Such interaction effects can be estimated by including two slope dummy variables, $wy \times lib$ and $px \times lib$, which are expected to capture the joint effects of the elimination of trade distortion measures (mainly those affecting exports) resulting from the liberalisation programmes on income and price elasticities, respectively. Thus:

$$x_{it} = \alpha_i + \partial_t + \beta_1 px_{it} + \beta_2 wy_{it} + \beta_3 x_{it-1} + \beta_4 d_{it} + \beta_5 lib_{it} + \beta_6 (px \times lib)_{it} + \beta_7 (wy \times lib)_{it} + \varepsilon_{it} \quad (5)$$

4.2 Dynamic Panel Data

In this section, two forms of panel data model are estimated. First, the fixed-effects estimator, based on the inclusion of dummy variables to account for factors that are specific to each country but constant over time (Greene, 1997). With dynamic models, using the standard within-group estimator generates estimates that are inconsistent, as the number of 'individuals' tends to infinity if the number of periods is kept fixed (see Nerlove, 1967; Nickell, 1981; and Harris and Mátyás, 1996). However, given that the number of time periods used in this study is relatively high (for panel data), it is likely that the bias generated by the inclusion of a lagged dependent variable will be very small. Secondly, dynamic panel data models based on generalised method of moments (GMM) estimators are also estimated. The GMM estimators control for the endogeneity of the lagged dependent variable and for the potential endogeneity of other explanatory variables (see Arellano, 1993; Arellano and Bond,

1998; Judson and Owen, 1999). The instruments used are based on lagged values of the explanatory variables.

<<Table 2 about here>>

The results from both estimators are reported in Table 2. Columns (i) and (ii) present the fixed effect estimates. As can be observed in column (i), there is a clear relationship between export growth and the change in the trade weighted real effective exchange rate (REER), world income growth and trade liberalisation. The long run income elasticity is 2.15, whilst the long run price elasticity is -0.11. Such a low price elasticity raises concerns about the possibility of losing export revenues in the process of the countries making themselves more competitive (through the devaluation of the real effective exchange rate, for example). The export duty variable, which accounts for the effects of the degree of distortions on export growth, is not statistically significant, although it has the expected sign. Additionally, a calculated export duty elasticity ($\varepsilon_d = -0.01$) shows that negative effects of the degree of trade distortion on export growth are minor, suggesting that apart from export duties, there are other factors that affect export growth, as for example non-quantitative restrictions and other country specific institutional elements. As regards the impact of reforms, trade liberalisation episodes seem to have a higher influence on export growth than export duties, since the direct impact of liberalisation is calculated to be 12 percent[17].

[17] The export duty elasticity is calculated as $\varepsilon_d = (\bar{d}/\bar{x})(\partial x/\partial d) = (\bar{d}/\bar{x})\,\beta = -0.0126$, where $\bar{d}$ and $\bar{x}$ are the medians of export duties and exports growth respectively. The proportionate impact of trade liberalisation is calculated as $\%lib = \left(\hat{\bar{x}}_{lib=1} - \hat{\bar{x}}_{lib=0}\right) \Big/ \hat{\bar{x}}_{lib=0} = 0.1215$ where $\hat{\bar{x}} = \hat{\beta}_1 \overline{px} + \hat{\beta}_2 \overline{wy} + \hat{\beta}_3 \bar{x}_{t-1} + \hat{\beta}_4 \bar{d} + \hat{\beta}_5 lib + \hat{\beta}_6 \overline{px \times lib} + \hat{\beta}_7 \overline{wy \times lib}$, and $\bar{x}_{lib=0}$ and $\bar{x}_{lib=1}$ are obtained by setting $lib = 0$ and $lib = 1$ respectively.

Regarding the slope dummy variables, the coefficients are not significant different from zero, but they show the correct sign. Moreover, the two interaction variables are collectively insignificant, with an F-statistic of F(2,418) = 0.34.

In column (ii), which provides a simpler specification, the coefficients of the short run income and price elasticities are statistically significant. The price elasticity confirms that the response of exports is in the expected direction, but the magnitude of the coefficient implies that export competitiveness does not rely merely in price indicators, at least for the case of the countries analysed. The export duty coefficient is not statistically significant, and although the magnitude of the coefficient is larger than the estimate in column (i), the calculated elasticity of -0.05 shows that negative effect of duties on export growth is minimal. The liberalisation coefficient shows that there is a significant export response to trade reforms - the direct (percentage) impact of liberalisation on export growth is 43 percent, confirming the noteworthy influence that trade reform has on the export performance of the economies analysed.

Turning now to the GMM estimates, column (iii) shows that the short run income and price elasticities (1.42 and -0.14) are both significantly different from zero. The long run income and price elasticities are 1.60 and -0.16, respectively. The negative impact of duties on export growth is confirmed, and the coefficient is relatively higher than in the fixed effect estimations. Also, the dummy variable that accounts for the effects of liberalisation on export growth is significantly different from zero, corroborating that the elimination of major trade policy distortions has a positive influence on export performance. Furthermore, the calculated export duty elasticity (-0.05) confirms the negligible influence that export duties have on export growth, in contrast to the higher proportional impact of trade liberalisation, which is estimated to be 21 percent. Column (iii) also includes the slope dummy variables defined previously. The interaction variable $wy \times lib$ is positive and significantly different from zero,

indicating that world's income growth improves export growth in more liberalised economies. In other words, the positive interaction between the income elasticity and external demand is a signal of successful trade liberalisation, since it suggests that the reduction and/or elimination of trade distortions, and hence greater openness to the world market, stimulates efficiency or induces structural change, as pointed out earlier. In contrast, $px \times lib$ is not significantly different from zero, and the magnitude of the coefficient is very low, though it has the expected negative sign. The coefficients of the two interaction terms are jointly significant according to the F-statistic F(2,360) = 78.51.

The results in column (iv) present a similar picture as the other estimations in Table 2. The estimates suggest statistically significant income and price elasticities. Additionally, the distortions indicator (i.e. export duties) is a significant determinant of aggregate export performance although the elasticity is again very small ($\bar{\varepsilon}_d = -0.05$). As in the previous columns, the trade liberalisation process (accounted by the shift dummy variable) is a more important factor influential export growth - the estimated percentage impact of liberalisation is 29 percent for column (iv).

4.3 Time-Series/Cross-Section

The previous section presented dynamic panel data estimates for the total group of countries analysed in this study. However, the evaluation of trade policy reforms in the different regions suggests that there is a diversity of experiences regarding trade liberalisation. Additionally, the estimates of income and price elasticities of demand suggest that such elasticities vary significantly across regions (Senhadji and Montenegro, 1999).

To examine whether the elasticities and trade liberalisation measures differ between geographical regions, the countries in the sample were classified in four zones: Africa, East Asia, South Asia, and Latin America. For this reason, a panel data model suitable to analyse

data observed for a relatively large number of periods and for a relatively small number of cross sectional units is implemented. Thus, this section analyses the empirical relationship described earlier for the total group of countries, and compares the results with the regional estimates.

The estimator is a two-step generalised least squares with maximum likelihood estimates (MLE) interaction. The model allows for groupwise heteroscedasticity, cross-group correlation, and within-group autocorrelation. The relevance of this type of model is that the error term need not have the same properties for each country[18]. The time-series/cross-section (TSCS) model allows for the error term of each cross section unit to be freely correlated across equations, as in the Seemingly Unrelated Regressions (SURE) case. Table 3 portrays the groupwise heteroskedasticity regressions with contemporaneous correlation and autocorrelated disturbances[19].

<<Table 3 about here>>

The results for all the countries in column (i) confirm the findings of the dynamic panel data estimates. There is indication of relative price and external demand effects on export growth. The results also suggest significant distortions and trade liberalisation effects. Column (i) provides, as well, evidence that trade liberalisation improves the sensitivity of exports to world income changes. However, the effects of the interaction between liberalisation and relative prices is not statistically significant, as in the fixed effects and GMM cases.

The region-specific estimates provide more diverse results. With reference to the income and price elasticities, the East Asia region presents the highest long run income elasticity (1.98), although Latin America and Africa also possess high income elasticities

[18] The models and estimators are analysed in Greene (1997, Chapter 16).
[19] The evidence of autocorrelation is probably indicative of misspecification and therefore not corrected by an autoregressive estimator.

(1.68 and 1.44, respectively). High income elasticities are a feature of export equations estimated for successful East Asian economies (Athukorala and Riedel, 1996), which is not only a result of the products they export, but an indication of very rapid improvements in product quality and efficiency driving export growth. Regarding the long run price elasticity, Africa has the highest elasticity (-0.36) but it is still low while East Asia has the lowest elasticity (-0.21). Another interesting result from the time-series/cross-section estimates is the significant negative impact that export duties have on export growth for the Latin America case. Bleaney (1999) argues that there are significant reform effects (both on total exports and manufactured exports), for the case of ten Latin American countries. Moreover, his study shows that, after reform, exports seem to react more strongly to real exchange rate signals and the income elasticity of demand is higher.

Trade distortions also play a relatively important role in East and South Asian countries. In Africa, export duties have a negligible impact on export performance. Nonetheless, the liberalisation of the trade regimes appears as a crucial determinant of export growth in all of the regions analysed.

Although the form of pooling considered in this section allows for some flexibility in the disturbance properties for each country, it requires the assumption of a common parameter vector. The evidence of residual serial correlation may suggest that some allowance for country specific effects is necessary.

5. Summary and Conclusions

The argument for analysing the relationship between trade liberalisation and exports is that the reduction or elimination of trade policy distortions reduces anti-export bias, and therefore improves export competitiveness. The countries analysed have undertaken serious

trade reforms, either as a part of major macroeconomic reforms, commitments with international regulations, or by decisions driven by a process of internal adjustment. Founded on such information, the present investigation provides empirical evidence supporting the premise that the elimination of trade policy distortions has a positive impact on export growth. As noted above, the analysis of export growth based on the export demand function approach represents a foremost contribution to the empirical literature since the study of the determinants of export growth has focused mainly on the supply approach to export performance. Furthermore, the application of dynamic panel data models to such an economic relationship constitutes another important contribution of the study.

The main empirical findings in this paper are:

- exports react negatively to an increase in relative prices as indicated by the calculated price elasticity;
- external demand (i.e. world income growth) has a positive effect on export growth;
- export duties, as an indicator of trade distortions, appear to negatively affect export growth, although the magnitude of the effect is small;
- trade liberalisation processes emerge as a positive and important determinant of export performance.

The calculated income and price elasticities differ between regions, as expected. East Asia has the highest long run income elasticity, although Latin America and Africa also possess high income elasticities. Africa has the highest long run price elasticity, but it is still relatively low. It is important to stress that the impact of trade distortion also varies between regions, where Latin America is the most affected by the degree of export duties, which is reasonable considering the high average duties prevailing in some countries before the liberalisation episodes. However, trade liberalisation emerges as a fundamental determinant of export growth in all the countries analysed.

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Table 1

Export Duties and Export Growth Before and After Trade Liberalisation

Country	Year of liberali-sation	Before liberalisation (from 1972) Export Duty	Export Growth	After liberalisation (up to 1997) Export Duty	Export Growth
		$0 \leq d < 1$ percent			
Chile	1976	0.0	8.8	0.0	10.2
Indonesia	1986	0.6	4.6	0.5	9.4
Korea	1990	0.0	16.0	0.0	15.3
Malawi	1991	0.4	4.4	0.0	5.2
Paraguay	1989	0.7	11.6	0.0	9.5
Venezuela	1991	0.0	-0.7	0.0	6.4
		$1 \leq d < 3$ percent			
Ecuador	1991	1.6	12.0	0.3	8.6
India	1991	1.4	6.5	0.2	12.2
Mexico	1986	2.0	9.5	0.02	12.8
Morocco	1984	2.1	4.3	0.5	7.3
Philippines	1986	1.4	6.4	0.1	10.9
Thailand	1986	2.7	8.8	0.3	14.6
Uruguay	1985	1.1	6.9	0.4	7.6
Tunisia	1989	1.2	7.4	0.3	4.9
Zambia	1990	2.4	-1.1	0.0	4.9
		$3 \leq d < 5$ percent			
Cameroon	1991	4.2	9.1	1.8	-0.9
Colombia	1991	4.5	5.7	0.3	8.6
Pakistan	1991	4.0	6.0	0.0	6.3
		$5 \leq d < 10$ percent			
Costa Rica	1990	7.9	6.2	2.6	8.7
Dom. Rep.	1992	5.3	6.6	0.01	29.3
Malaysia	1988	6.9	8.9	1.7	14.1
		10 percent or more			
Sri Lanka	1990	13.5	4.3	0.7	9.3

Sources: Dean *et al* (1994), UNDP/UNCTAD (1999), World Bank (1999), WTO Trade Policy Reviews (various issues).

Note: d denotes export duties. The values are period averages, and are the author's calculations.

Table 2

Export Performance in Selected Developing Economies (1972-97):

Unbalanced Dynamic Panel Data

	Dependent variable: export growth x_t			
	Fixed effects		**GMM**	
Explanatory variables:	**(i)**	**(ii)**	**(iii)**	**(iv)**
px	-0.11 (1.86)*	-0.10 (1.87)*	-0.14 (2.09)*	-0.16 (2.45)**
wy	2.09 (3.26)**	1.53 (3.09)**	1.42 (2.60)**	1.54 (1.99)*
x_{t-1}	0.03 (2.25)*	0.03 (2.06)*	0.11 (4.78)**	0.15 (8.94)**
d	-0.05 (1.07)	-0.19 (1.01)	-0.16 (1.89)*	-0.19 (2.16)*
lib	0.85 (2.29)*	1.91 (2.45)*	1.56 (2.28)*	1.94 (2.49)**
$wy \times lib$	0.58 (1.40)		1.41 (3.58)**	
$px \times lib$	-0.06 (0.62)		-0.07 (0.32)	
wy_{LR}	2.15	1.58	1.60	1.81
px_{LR}	-0.11	-0.10	-0.16	-0.18
	Diagnostic statistics			
R^2	0.53	0.51		
Omit $wy \times lib$, $px \times lib$	0.34		78.51	
Heteroscedasticity test	[0.31]	[0.19]		
Wald test			[0.000]	[0.000]
Sargan test			[0.461]	[0.589]
1st-order serial correlation			[0.027]	[0.000]
2nd-order serial correlation			[0.793]	[0.356]
Number of observations	480	480	362	362

Table 3

Two Steps Generalised Least Squares and Maximum Likelihood Estimation

Groupwise Heteroskedastic and Correlated Regression, Common Autocorrelation

	Dependent variable: export growth x_t				
Explanatory variables:	**All countries**	**Africa**	**East Asia**	**South Asia**	**Latin America**
	(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**
Constant	-0.99 (0.66)	-6.54 (1.44)	0.30 (0.14)	3.73 (2.27)*	0.39 (0.35)
px	-0.18 (3.96)**	-0.35 (2.16)*	-0.23 (2.24)*	-0.21 (3.49)**	-0.21 (5.51)**
wy	1.76 (3.82)**	1.39 (3.07)**	1.71 (2.63)*	0.32 (2.24)*	1.41 (4.99)**
x_{t-1}	0.10 (2.62)*	0.04 (1.04)	0.14 (1.77)*	0.23 (1.99)*	0.17 (3.02)**
d	-0.19 (2.02)*	-0.10 (0.13)	-0.55 (1.93)*	-0.31 (3.08)**	-0.81 (4.66)**
lib	1.99 (3.76)**	3.58 (2.42)**	2.42 (2.53)**	2.54 (3.53)**	1.66 (6.37)**
$wy \times lib$	1.36 (1.94)*	1.25 (0.58)	1.16 (2.31)*	0.60 (0.64)	1.62 (3.51)**
$px \times lib$	-0.04 (0.66)	-0.38 (1.19)	-0.09 (0.69)	-0.12 (0.65)	-0.13 (2.44)**
wy_{LR}	1.95	1.44	1.98	0.42	1.68
px_{LR}	-0.20	-0.36	-0.21	-0.27	-0.25
	Diagnostic statistics				
LRS	167.72 (38.93)	8.33 (12.59)	18.54 (25.00)	10.17 (7.81)	67.90 (58.62)
Number of observations	440	80	120	60	180

Notes to Tables 2 and 3:

1. Figures in parenthesis ( ) are absolute t-ratios; figures in brackets [ ] are p-values.
2. * indicates that a coefficient is significant at the 5 percent level, and ** that it is significant at the 1 percent level.
3. Omit $wy \times lib$, $px \times lib$ is the F-statistic for the omission of these two variables from the regression.
4. wy_{LR} and px_{LR} are the long run income and price elasticities, respectively.
5. Heteroscedasticity test is based on a regression of the residuals on the squared fitted values. The Wald test is for the joint significance of the regressors. The Sargan test is of over-identifying restrictions. The tests for 1^{st} and 2^{nd} order serial correlation are asymptotically distributed as standard normal variables (see Arellano and Bond, 1991). The p-values report the probability of rejecting the null hypothesis of serial correlation, where the first differencing will induce (MA1) serial correlation if the time-varying component of the error term in levels is a serially uncorrelated disturbance.
6. The GMM estimations were performed using the programme DPD98 for Gauss (Arellano and Bond, 1998).
7. Likelihood Ratio Statistic (LRS) is the test for serial correlation. The numbers in parenthesis are the critical values.

APPENDIX

Data Definitions and Sources

Export Growth (*x*): Exports of Goods and Services; annual percentage growth (constant 1995 US$). Source: World Bank, *World Development Indicators* (WDI), 1999.

World Income Growth (*wy*): World GDP; annual percentage growth (constant 1995 US$). Source: World Bank, *World Development Indicators* (WDI), 1999. The activity variable is defined as the difference between world GDP and country GDP, that is:

$$WY_i = WorldGDP - GDP_i$$

Export Duties (*d*): Export duties (% of exports); includes all levies collected on goods at the point of export. Source: World Bank, *World Development Indicators* (WDI), 1999.

Real Effective Exchange Rate (*px*): Data for the REER for Colombia, Costa Rica, Ecuador, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, and Tunisia are from Bahmani-Oskoowee and Mirzai (2000). The REERs for the remaining countries are constructed from IMF's *IFS* (various issues). The REER for country *j* at time *t* is defined as:

$$REER_{jt} = \sum_{i=1}^{n} \alpha_{ij} \left(\frac{\left(P_j R_{ji} / P_i\right)_t}{\left(P_j R_{ji} / P_i\right)_{95}} \times 100 \right)$$

where: *n* is the number of trading partners; P_j (P_i) are prices in country *j* (*i*); R_{ji} is the exchange rate defined as number of country *i*'s currency per unit of country *j*'s currency; and α_{ij} is the share of country *j*'s trade with country *i* where $\sum_1^n \alpha_{ij} = 1$

Table A1: Trade Reform in Developing Countries

Region/Country	Reform		Trade reform measures	Exports incentive instruments
	First	Most recent		
South Asia				
India	1989	1991	Some tariff increases and net additions to the OGL. Significant liberalisation of tariffs and QRs in the 1991 reform programme. Unification of the exchange rate regime.	Duty exemption and drawback compensation schemes. Removal of restrictions on manufactured exports (between 1990-93).
Pakistan	1989	1991	Replaced non-tariff barriers with tariff, reduction of maximum tariff rates and reduction of exemptions from tariff. Some restrictions in capital account transactions were removed in 1991, and new instruments are not subject to exchange controls.	Duty drawback scheme. Liberalisation of raw material and intermediate goods imports for export industries. In 1991 foreign companies were allowed to undertake export trade.
Sri Lanka	1987	1990	Reduction of the range and number of goods requiring licensing. Exchange rate reform started in 1984. By 1994 most exchange controls were removed.	Elimination of exports duties, mainly in non-traditional exports. The Export Development Investment Support Scheme was established. Tax holidays on profit for exporters was introduced (for a limited period).
East Asia				
Indonesia	1985	1990	Reduction in the coverage of non-tariff import barriers. Tariffs were reduced to around 10 percent by 1993.	Promotion of non-traditional exports. Import duties were abolished, whilst surcharges and VAT on imported inputs were introduced.

Korea	1984	1990 1998	Removed non-agricultural QRs. Reduction of unweighted average tariff.	Simplification of exports procedures. Elimination of export subsidies, including reserves for export losses or exporters; reserves for exporters' overseas market development; and tax incentives for foreign investment.
Malaysia	1986	1989	Tariffs reductions were made between 1988 and 1992, in items including food, household goods, clothing, electrical and electronic goods.	Duty drawbacks scheme, and tariff concession for raw materials and components used in manufacturing.
Philippines	1986	1989	Gradual replacement of QRs with tariffs. Reduction of tariff bands. Reform of customs procedures.	Tax exemptions on imported and locally supplied inputs provided through bonded warehouses, and duty exemptions. Other tax incentives for export activities were provided by the Export Development Act of 1994. Sugar, textiles and clothing exports remain subject to special arrangements in foreign markets. Reform of foreign investment law to promote export oriented FDI.
Thailand	1982	1990	Elimination of non-agricultural QRs. Tariffs reductions programme, but later reversed.	Remission of tariffs and business taxes on inputs used in exports, development of export processing zones, concessional export credits and assistance in marketing and promotion of exports. Removal of export taxes on major agricultural commodities.
Africa				
Cameroon	1989	1991	Elimination of QRs on imports.	Export taxes were eliminated, principally on coffee and cocoa. Export duties and insurance and transportation taxes exemption. Reduction of 5 percent of the value of export from their taxable income.
Malawi	1988	1991	Reduction of import duties. Limitation of foreign exchange allocation to a small negative list. Transfer QRs to surtaxes.	Periodical adjustment of the exchange rate. Export promotion strategy and export financing facility. Reduction of the scope of exports licensing.

Morocco	1983	1989	Reduction in QRs on non-competitive goods. Sharp reduction of maximum tariff; new tariff surcharge.	Tariff and VAT concessions for export goods (including duties and levies, especially on imported inputs, and concessions with respect to the tax on exporter's profits). Industrial and free trade zones are allowed to operate. Except for hydrocarbons and certain services, duties and taxes on exports have been abolished. The taxes levied on agricultural and mining exports were abolished by the 1995 Finance Act.
Tunisia	1987	1990	Gradual replacement of QRs with surcharges. Tariff reduction; increases in surcharges.	Restructuring of the Centre to Promote Exports (CEPEX), reinforcement of the intervention of the Fund for the Promotion of Exports (FOPRODEX) to support the promotion of exports, amending the law on international trade companies to widen the scope of their activities. Liberalisation and easing the system of export insurance.
Zambia	1990	1990	Gradual increase of OGL and exchange rate unification. Reduction of maximum tariff rate and range.	Liberalisation of export retention scheme. Promotion of non-traditional exports. Reform of the duty drawback scheme, to permit drawback as a credit against import tax liabilities, and to reduce third-party exporters. Introduction of VAT, and exports were regarded as zero-rated.
Latin America and Caribbean				
Chile	1985	1988	By 1985 Chile had virtually no QRs (and prohibited by the Constitution). Reduction of uniform non-tariff rate.	Extension of the drawback scheme; payments of duties of capital goods import could be delayed; establishment of a small fund for export financing.

Colombia	1985	1991	Significant reduction in both levels and dispersion of tariff rates and expanded the number of tariff positions on the free import list. Elimination of import licensing, reductions in the levels of tariffs, reduction of the number of tariffs from 14 in 1990 to 4 in 1993, and liberalisation of the exchange rate. Supplement of tariff reductions by a competitive exchange rate. In 1991 all foreign exchange operations were to be transacted at the market determined exchange rate, and foreign exchange controls were relaxed, and foreign licenses were abolished.	Tax Reimbursement Certificates (CERTs), the establishment of the export promotion agency (PROEXPO credit). Duty drawback scheme for imported inputs used for export production.
Costa Rica	1985	1990	Reduction in average tariff rates and a decrease in the dispersion of rates. In January 1992 the foreign exchange system was deregulated, floated the exchange rate, opened the capital account, and eliminated foreign exchange controls	Virtual elimination of import licensing requirements. Export subsidies (prevalent prior 1986) have remained high: full tax exemption on income earned on non-traditional exports to non-regional markets and full tariff exemptions on imports used in export promotion, which take the form of certificates that can be traded.
Dominican Republic	1990	1992	Non tariff barriers were largely dismantled. Tariffs reform (both number and rates). Reduction of import surcharge, and further abolition in 1995. Customs modernisation. Simplification of the exchange rate system.	Abolition of all export restrictions: licensing, minimum prices for agricultural products and taxes. Simplification of administrative procedures. All tax incentives and ad hoc measures, except those applied to free trade zones, were eliminated.
Ecuador	1985	1991	Segmented elimination of QRs. Tariff maxim reduced to 35 per cent.	Introduction of a new tax law, an in-bond industry law, liberalised foreign investment regulations. Introduction of new law that would simplify procedures for exporters. Subsidy through the exchange rate program “Advanced Sale of Foreign Exchange”.

Mexico	1985	1988	Progressive removal of import restrictions and their replacement with tariffs. In 1986 import- licensing coverage was reduced, and in 1987 all minim prices were eliminated. The QRs have been almost eliminated from intermediate capital goods. In 1991 the foreign exchange markets were unified, and a band within the peso was allowed to fluctuate was established.	Export regulations have been liberalised significantly. In 1986 exporters were allowed to keep foreign exchange equivalent to 100 percent of future imports. In 1989 export taxes were eliminated and by 1990 official reference prices were removed. The coverage of export licenses declined from 48.9 percent in 1985 to 17.6 percent by 1991,were a substantial proportion of the remaining licenses apply to agricultural and agroindustrial products.
Paraguay	1989	1995	Simplification of the tariff structure and reduction of rates. Non-tariff barriers applied to few agricultural products were replaced by tariff. Exchange controls were abolished, establishing a free-floating exchange rate.	Reduction of duty rates, and industrial promotion.
Uruguay	1983	1985	QRs and other barriers to trade were removed, trade regulations were simplified, and a gradual process of reducing import duties was established. Administrative controls have been reduced.	Tax and duty exemptions to selected activities, temporary admission, duty drawback scheme and free trade zones. FDI, mainly in banking and tourism sectors was promoted. References prices were eliminated in 1994, but minimum export prices are still applied on a few items (textiles and clothing, and sugar).
Venezuela	1989	1991	Virtual elimination of up from QRs, re-established by 1992. Reduction and rationalisation of maximum tariff. Unification of the four markets exchange rates. Foreign exchange controls were abolished.	Currency retention scheme for non-traditional exporters (between 1983-86). Introduction of a bonus scheme where exporters received a certificate applicable to any federal tax. The export subsidy rate was lowered, all export restrictions were eliminated and a duty-drawback scheme with a flat rate of 5 percent was introduced.

Sources: Dean *et al* (1994); IMF (1998); IMF (1999); Winglee *et al* (1992); WTO Trade Policy Reviews (various issues); Musonda and Adam (1999).
Note: OGL = open general license; QRs= quantitative restrictions.