The Impact of Trade Reforms on Mexico's Imports

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1. Introduction

During the mid-1980s Mexico was induced to adopt trade reforms as a central lever of the free-market strategy in combination with structural adjustment policies imposed by the International Monetary Fund, the World Bank and other multilateral institutions (Edwards, 1993; Rajapatirana, 1996; Skott and Larudee, 1998). As a consequence of the high internal and external debt in 1982 and the crisis in the international oil market, the country was largely excluded from international financial markets. It accepted almost any conditions from the international institutions in order to obtain financial assistance. The new development strategy involved diverse actions: the budget deficit was cut dramatically; price controls and subsidies were removed; the size of the public sector was greatly reduced through wide-ranging privatisation; foreign investment was encouraged by legislative reforms; and monetary conservatism was combined with prices and incomes policies to control inflation. In fact, during 1985 the main trade reforms started and trade liberalisation[1] was institutionalised.

In 1986, Mexico joined the General Agreement on Tariffs and Trade (GATT). The following year, trade liberalisation was accelerated beyond the requirements of the GATT. This was a key component to halt the increase in prices, based on the assumption that competition from imports would put a ceiling on inflation for traded goods (Dornbusch

* I would like to thank Professor A.P. Thirlwall for helpful comments.
[1] *Cfr.* Weiss (1992), Krueger (1998) and Greenaway *et al*. (1998) for different concepts of trade liberalisation.

and Werner, 1994; OECD, 1996). During the 1990s, with the negotiations of the North American Free Trade Agreement (NAFTA), the economy became very much more open to foreign trade and capital flows than previously.

One of the most common criticisms of trade liberalisation, particularly in developing countries, is that it increases import penetration. Indeed, Mexico has experienced a large increase of imports relative to output, specifically during the 1990s. In constant prices, imports of goods and services as a proportion of output doubled in twenty years. Import penetration increased from about 21 percent of GDP in 1980 to 52 percent in 2000 (see Table 1). The dynamics of Mexican imports led the country to be ranked 10th in the list of leading importers in world merchandise trade (WTO, 2001), which is three places above its ranking position for exports.

Table 1
Imports of Goods and Services (% of GDP)

Year	Ratio	Year	Ratio
1980	20.85	1991	22.89
1981	22.56	1992	26.42
1982	14.11	1993	26.40
1983	9.75	1994	30.65
1984	11.09	1995	27.75
1985	11.99	1996	32.43
1986	11.52	1997	37.29
1987	11.89	1998	41.38
1988	16.05	1999	45.39
1989	18.17	2000	51.55
1990	20.71		

Source: World Development Indicators (2002).

Concerning previous studies of Mexico's imports, Alfaro and Salas (1992), Clavijo and Faini (1990), Galindo and Cardero (1999), Ize (1989), López and Guerrero (1998), Moreno-Brid (1999), Salas (1982 and 1988), and Sotomayor (1997) have all analysed the

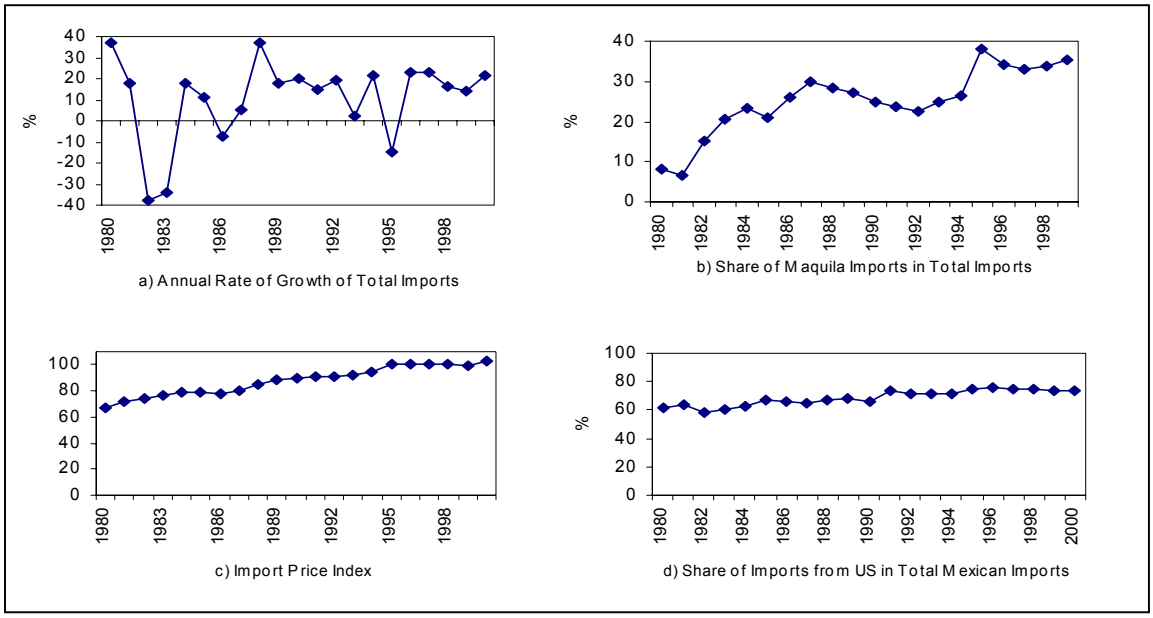
effects of trade restrictions on Mexico's demand for imports, either including dummy variables or other measures that capture the effect of tariff and non-tariff restrictions on imports. However, most of these studies focus on the analysis of income and price elasticities, except Moreno-Brid (1999), rather than examining the effects of trade reforms on imports. In other words, although they controlled for the effects of trade liberalisation, they neglected to interpret the results. Also, these studies do not differentiate the impact of NAFTA on import performance from the trade reforms launched during the mid-1980s.

In order to elucidate the role played by trade liberalisation on Mexico's imports, a number of questions are addressed in this paper: how has the composition of imports changed following trade liberalisation? What effects have trade reforms had on the volume of imports? How much of the import growth can be explained exclusively by trade liberalisation? The remaining sections of the paper are organised as follows. Section two describes the import composition over the past twenty years. Section three briefly presents an overview of trade policy reforms. Section four shows the import model and the econometric techniques used for the statistical analysis. Section five carries out the study of the impact of trade reforms on imports at the aggregate level. Section six analyses the effect of trade reforms on imports at a disaggregated level. Finally, section seven concludes.

2. Import Composition

To have a better understanding of the performance of Mexican imports during the last twenty years, we look at some important characteristics of Mexico's imports, which are shown in Graph 1.

Graph 1
Changes in Mexican Imports



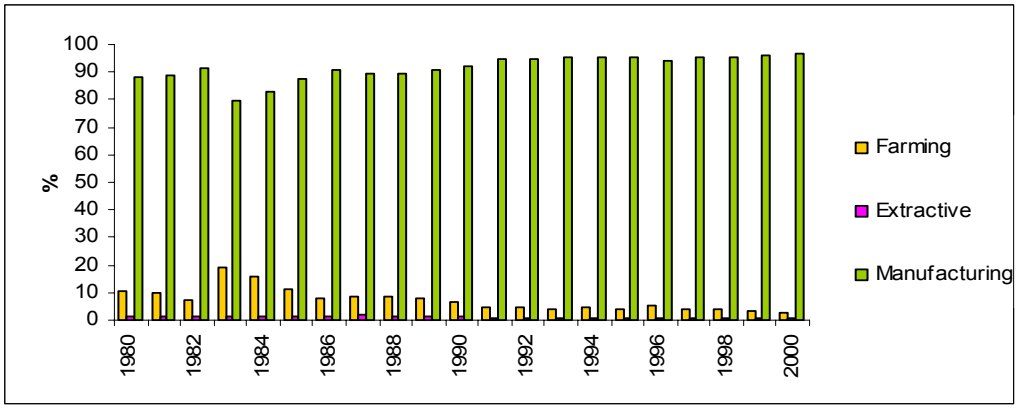
Note: All the variables are measured in constant prices (1995=100) or 1995 is used as a base year.
Source: Banco de México, Instituto Nacional de Estadística, Geografía e Informática (INEGI), Direction of Trade Statistics Yearbook (2001) and World Development Indicators (2002).

Panel a) shows the annual rate of growth of total imports. Major real exchange rate devaluations have always had a strong impact on imports. The large drop in 1982-83 corresponds to the debt crisis which left the country with a very low level of foreign currency. The next negative rate of growth is linked to the 32 percent real exchange devaluation which occurred in 1986. Again, imports registered a negative growth rate of 15 percent in 1995, when the GDP fell by 6 percent and the Mexican peso was devalued against the US dollar by 45 percent in real terms.

Panel b) shows the rise in *maquiladora* imports as a share in total Mexican imports. Panel c) gives the import price index (1995=100), which shows an upwards tendency. In panel d) we observe that the US represents the major import source for Mexico, which has increased gradually through time.

Now, we turn to analyse import composition and import growth rates in more detail. Graph 2 shows the changes in the three main sectors: farming, extractive industries and manufacturing. In general, the shares of the three sectors have not changed significantly.

Graph 2
Share of Main Sectors in Imports, 1980-2000
(% of Total Imports)

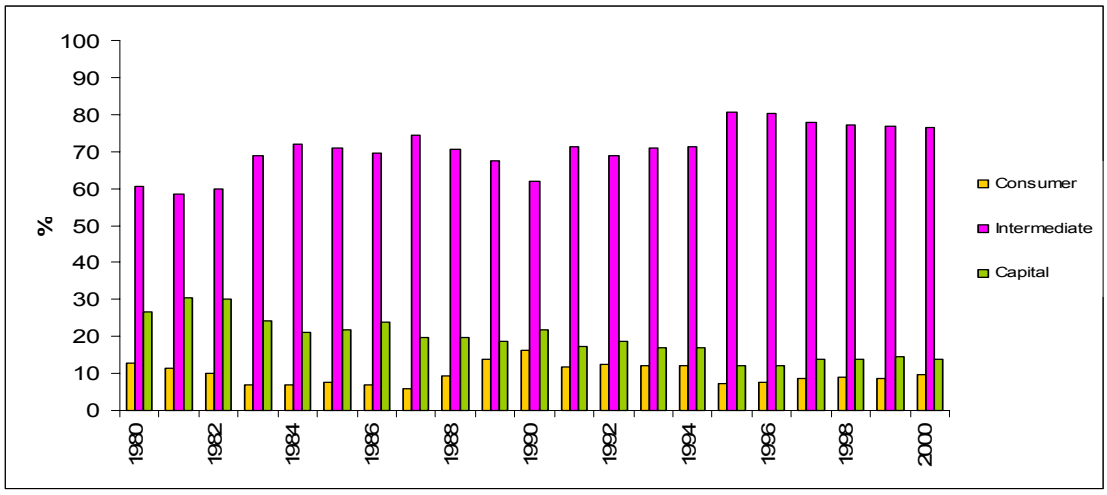


Source: Banco de México and Instituto Nacional de Estadística, Geografía e Informática (INEGI).

There is no noticeable change in import composition either after the mid-1980s trade reforms or after 1994, when NAFTA was signed. Meanwhile, the share of farming imports has gradually declined. Throughout the period 1980 to 2000 manufactures represent the biggest share in total imports, and extractive imports the smallest share.

A different categorisation of imports is given in Graph 3, by decomposing total imports into consumer goods, intermediate goods and capital goods. In 1980, their shares in total imports were 13 percent, 60 percent and 27 percent, respectively. During twenty years, the composition changed very little; with intermediate goods continuing to account for the major share in total imports. Hardly any change seems to be associated with the trade reforms in the mid-1980s or NAFTA.

Graph 3
Goods Composition of Imports, 1980-2000
(% of Total Imports)



Source: Instituto Nacional de Estadística, Geografía e Informática (INEGI) and Banco de México.

Further examination of Mexico's imports is related to the analysis of the structure of the manufacturing sector itself. It is composed of nine sub-sectors: Food Products, Beverages and Tobacco; Textiles and Leather Products; Wood Products; Paper Products, Publishing and Printing; Chemicals, Rubber and Plastic Products; Non-Metallic Mineral Products; Basic Metals; Machinery and Equipment; and, Other Products. Table 2 illustrates the distribution of imports by the nine manufacturing sub-sectors from 1980 to 1999.

Table 2
Distribution of Imports by Manufacturing Sub-Sectors, 1980-1999

Year	Food Products, Beverages and Tobacco	Textiles and Leather Products	Wood Products	Paper Products, Publishing and Printing	Chemicals, Rubber and Plastic Products	Non-Metallic Mineral Products	Basic Metals	Machinery and Equipment	Other Products
1980	6.94	1.59	0.49	3.79	16.07	12.10	2.67	55.73	0.61
1981	4.89	1.83	0.40	3.20	14.20	10.99	2.74	61.14	0.62
1982	5.09	1.99	0.38	3.47	17.16	8.76	2.09	60.49	0.56
1983	7.41	0.66	0.32	4.10	22.44	6.63	1.54	56.62	0.27
1984	4.99	0.98	0.37	3.76	22.82	8.26	2.48	55.96	0.38
1985	4.04	1.14	0.39	3.30	23.35	6.71	3.00	57.56	0.52
1986	4.38	1.21	0.43	3.85	21.43	6.43	1.74	60.09	0.45
1987	3.88	1.45	0.36	5.13	22.51	6.22	1.96	57.97	0.51
1988	6.80	2.50	0.44	4.40	19.41	6.90	2.26	56.56	0.73
1989	8.82	3.56	0.49	4.09	19.49	6.75	2.03	53.66	1.11
1990	9.39	3.67	0.61	3.72	17.33	6.80	1.56	55.78	1.14
1991	5.61	4.76	0.91	3.86	17.12	7.58	1.69	57.28	1.18
1992	5.83	3.53	0.96	3.82	16.66	7.30	1.83	58.93	1.12
1993	5.45	5.73	0.93	3.84	16.61	6.71	1.57	57.94	1.22
1994	5.36	5.60	0.93	4.08	15.89	6.64	1.60	58.43	1.46
1995	3.88	5.36	0.52	4.29	17.54	6.82	1.78	58.83	0.98
1996	3.84	5.67	0.48	3.56	18.15	7.16	1.73	58.50	0.91
1997	3.53	6.06	0.45	3.23	18.15	6.83	1.79	58.82	1.13
1998	3.38	6.39	0.47	3.04	16.95	6.68	1.96	59.85	1.29
1999	3.13	6.55	0.50	2.94	16.64	6.02	1.85	61.16	1.21

Source: Own calculations based on data from Banco de México and Instituto Nacional de Estadística, Geografía e Informática (INEGI).

Comparing the distribution of manufacturing imports, from 1980 to 1999, we observe that it has not changed significantly. On average, two sub-sectors, Chemicals, Rubber and Plastic Products, and Machinery and Equipment, account for 75 percent of manufacturing imports. The import share of the latter sub-sector, however, is by far the largest. The bulk of manufacturing imports have been concentrated in this particular sector, even before the mid-1980s trade liberalisation was launched. By contrast, on average, the Wood Products sub-sector had the lowest share of manufacturing imports.

The above descriptive analysis shows the difficulty that we are going to face in order to distinguish and evaluate the effects of trade reforms on imports from those effects related

to the real exchange and income variations. Imports were often affected by recurrent devaluations and restrictive trade policy in order to control balance of payments problems.

3. Overview of Trade Policy Reforms

a) Mexican trade policy before the 1985 liberalisation

Economic development in Mexico during the 1950s to 1970s is conventionally referred to as the import substitution phase (Balassa, 1983; Cárdenas, 1996; Lustig, 1992; Skott and Larudee, 1998), since the internal market provided the main source of demand for most sectors and various policy interventions restricted the access to imports. Three main forms of trade controls were applied: import tariffs, licensing restrictions, and official reference prices. From 1955 up to the 1970s, these operated with a fixed nominal exchange rate that was devalued twice during the period, once in 1976 by 25 percent and again in 1977 by 47 percent. However, Mexico was far from being a closed economy, and the effect of the various trade controls was less protectionist than in a number of other economies that have been characterised as pursuing import-substitution policies (Weiss, 1992).

Import licensing was extended in 1956 and the proportion of imported goods subject to licensing rose steadily, chiefly in response to balance-of-payments difficulties. During that year, 17.7 percent of total imports were subject to licences; this rose to 53.8 percent in 1961, reaching 90.4 percent in 1976 and 100 percent at the time of the 1982 debt crisis (see Table 3).

Table 3
Imports as % of total imports controlled by licensing system

Year	%	Year	%	Year	%
1956	17.7	1967	65.2	1978	76.3
1957	35.1	1968	64.4	1979	70.0
1958	42.5	1969	65.1	1980	60.0
1959	43.2	1970	68.3	1981	85.5
1960	37.8	1971	67.7	1982	100.0
1961	53.8	1972	66.3	1983	100.0
1962	52.5	1973	69.6	1984	83.5
1963	63.5	1974	82.0	1985	37.5
1964	65.5	1975	68.4	1986	30.9
1965	60.0	1976	90.4	1987	27.5
1966	62.0	1977	90.0	1988	19.7

Source: Weiss (1992).

The discovery of substantial oil reserves, and the subsequent increase in petroleum exports after 1977, gave the country easy access to international private borrowing (Lustig, 1992; Cárdenas, 1996). With the increase of petroleum exports, the ratio of the trade balance to GDP changed from a deficit of 2.7 percent in 1975 to a surplus of 0.1 percent in 1977. These improvements, and the potential for future increases in petroleum exports, allowed a partial relaxation of the trade controls (Balassa, 1983).[2] It became easier to obtain licenses (Weiss, 1992). These factors were responsible for a significant growth in imports. For instance, in 1978 imports registered an increase of 22.01 percent, and in 1980 they increased by 37.1 percent.

The decision taken by President Lopez Portillo against GATT membership in March 1980 marked the beginning of a period of renewed import restrictions. Moreover, a combination of rising international interest rates, declining international oil prices (which negatively affected oil export revenues), diminishing access to international credit, and an

[2] Balassa argues that these facts reflected the perception that import liberalisation was necessary in order to reduce the existing bias against exports and raise levels of efficiency by exposing Mexican industry to foreign competition.

appreciating real exchange rate, created new exchange rate difficulties in 1981. The lack of foreign exchange that this represented was met chiefly by the reintroduction of import controls rather than by a reduction in domestic expenditure (Balassa 1983; Ten Kate, 1992; Weiss, 1992).

These events were followed by the introduction of major devaluations of the nominal exchange rate combined with a crawling peg policy. At the same time, beyond the exchange rate devaluations and exchange rate controls, licences were extended to cover all imports. As a consequence, in 1982 imports fell by 37.8 percent; meanwhile, exports rebounded by 22.5 percent.[3] During 1982-84 nominal exchange rate depreciation was substantially below domestic inflation, so that the real exchange rate appreciated in 1984. Thus, the dynamic behaviour of exports was gradually lost; and, to keep domestic and export production going, imports were allowed to grow again. To prevent further deterioration of the trade balance,[4] exchange rate devaluation was accelerated in 1985.

b) Trade liberalisation process

Beyond other macroeconomic reforms, Mexico's trade liberalisation, according to mainstream economic theory, was necessary in order to increase the competitiveness of domestic industry (Balassa, 1983; Ten Kate, 1992). The official arguments to justify trade liberalisation were, among others, the poor growth performance, which was attributed to inefficient productive structures resulting from protectionist policies, counterproductive government participation and resistance to foreign investment. Following this underlying

[3] Moreover, a relatively successful restructuring of foreign debt brought the balance of payments back under control.
[4] In 1985, exports decreased by 4.5percent, while imports increased by 11percent.

postulate, reiterated by the Baker Plan at the annual meeting of the IMF and the World Bank during October 1985 in Seoul, the Mexican government confirmed its promise to liberalise trade:[5]

> …policies should be adopted that attacked (sic) the real causes of poor economic performance, which implied (sic) trade liberalisation, privatisation of state companies and a more tolerant attitude toward private foreign investments…

It was expected that the effects of those reforms were going to make the trade sector the engine of growth.[6]

The programme of trade reform introduced in Mexico in the period 1985-87 was one of the most far-reaching of any developing economy.[7] In a relatively brief period, tariff rates on most products were quickly reduced, reference prices were progressively removed and non-tariff controls were drastically decreased or eliminated.[8] The first stage of the import liberalisation programme was implemented in June 1985, when licenses were eliminated on almost 3,600 tariff lines, which left only 908 under control (Ten Kate, 1992). Thus, imports controlled by the licensing system fell from 83.5 percent in 1984 to 37.5 percent in 1985.

[5] Taken from Ten Kate (1992).
[6] Particularly, trade reforms gave a stimulus to the manufacturing trade sector, but they did not influence the rate of growth of GDP as expected, see Dussel (2000) and Ruiz-Nápoles (2001).
[7] Weiss (1992) suggests that it appears that a weakening in the performance of non-oil exports was a key factor in convincing the administration of the need for trade liberalisation. However, the data show a slowdown of exports of goods and services, which may be explained by the post 1982-debt crisis. Contrary to Weiss's argument, Edwards (1993), Pastor (1994), Skott and Larudee (1998), among others, claim that the impulse of trade liberalisation was part of the structural adjustment programmes recommended by the IMF and WB.
[8] Accelerated trade liberalisation was based on the assumption that competition from imports would put a ceiling on inflation for traded goods. Kehoe (1995) supports that trade liberalisation played a major role in establishing the credibility of the government's commitment to low inflation.

During the second half of the 1980s two other steps in Mexico's commitment towards trade liberalisation were formalised. First, in August 1986 Mexico became a member of GATT. The country was committed to eliminate official prices for most goods by the end of 1987. However, most of the reforms required to enter GATT were already realised or even surpassed with the unilateral liberalisation programme during 1985. It is important to note that from June to December 1985 the coverage rate of import licensing fell from 92.2 percent to 47.1 percent, so that more than half of domestic production was no longer protected by import licenses (see Table 4).[9] Therefore, Mexico's accession to GATT did not imply an intensification of its liberalisation process, but rather it was considered a signal by policy makers of their intention to carry on the trade liberalisation policy (Ten Kate, 1992). An alternative explanation of this fact is that policy makers launched trade reforms in advance in order to have access to GATT without any restriction.

Table 4
Quantitative Indicators of the Mexican Import Regime during the 1980s (%)

	1985 June	1985 December	1986 December	1987 December	1988 December	1989 December
Domestic production value covered by import licensing	92.2	47.1	39.8	25.4	21.3	19.8
Production-weighted tariff averages	23.5	28.5	24.5	11.8	10.2	12.5
Domestic production value covered by official import prices	18.7	25.4	18.7	0.6	0.0	0.0

Source: Ten Kate, 1992.

Less dramatic reductions in import licensing and tariff coverage of imports continued in subsequent years, so that in 1988 official prices were abolished entirely and in 1989 only

[9] During the same period the tariff average increased from 23.5 percent to 28.5 percent (this reflects the tariff compensation for license elimination), while the coverage of official prices increased from 18.7 percent to 25.4 percent.

19.8 percent and 12.5 percent of imports were protected by the licensing system or tariff coverage, respectively.

After 1988, the emphasis was on reducing the dispersion in tariff rates with the objective of producing a broadly uniform system of effective protection. Commerce Ministry decrees, in January and March 1989, raised tariffs for those commodities subject to only 5 percent tariff rates and gave positive rates to many goods previously exempt. The reduction of the rest of the import licensing and tariffs was negotiated in the NAFTA, an issue that is going to be considered in the next section.

The second step towards trade liberalisation was stimulated by the liberalisation of Mexico's capital market. In 1989, the government announced changes in the Law on Foreign Investment, which consisted of the gradual elimination of some of the restrictions on foreign investment particularly in the capital -and technological- intensive industries.

c) Trade after NAFTA

NAFTA started on 1st January 1994. It removed most of Mexico's remaining barriers to trade and investment, either immediately upon its implementation or gradually thereafter. There is a schedule over a ten to fifteen year period.[10] Its main function, among other objectives, has been to embody the newly-opened regime in a comprehensive international agreement in order to lock-in free market policies against a future change of government

[10]The full NAFTA text can be consulted in http://www.economia-snci.gob.mx/Tratados/pdfs/tlcan1.pdf

in Mexico, (Skott and Larudee, 1998). Again, the argument of the trade sector as the engine of growth was well promoted.

Since the negotiations of NAFTA, which started in 1991 (Graham and Wada, 2000; Krueger, 2000), the trade volume of Mexico has risen markedly. For instance, in 1992 the exports/GDP share was 15.2 percent, which doubled by 1998, reaching 31.2 percent. At the same time, import penetration rose from 20.2 percent to 33.2 percent. In addition to the increase in trade volume, the trade structure was changing, but the interpretation of the change was misleading by policy makers. The Salinas administration (1988-1994) argued that the current account deficit that Mexico was registering was a natural condition for a developing country that required imports of capital goods to restructure its manufacturing sector. This was not the case for Mexico's trade at that moment. Although the largest component of merchandise imports from 1987 to 1994 was intermediate goods, which were necessary to support the export performance of the Mexican economy, the fastest growing component of imports throughout the period was consumer goods, which grew at twice the rate of total imports (see Table 5). Moreover, not all the capital inflows were being used to finance investments.

Table 5
Structure of Merchandise Imports

	1987	1990	1992	1994	1996	1998	Growth rates 1987-98
Consumer goods	4.08	12.26	12.46	11.98	7.44	8.86	**32.33**
Intermediary goods	81.94	71.42	68.94	71.23	80.35	77.32	**18.20**
Capital goods	13.98	16.32	18.60	16.78	12.20	13.82	**19.58**

Source: Banco de Mexico.

At the end of the first year of the implementation of NAFTA, notwithstanding the improvement of some macroeconomic variables, economic activity was vulnerable to international shocks related to capital flows (which were rapidly depleting the foreign exchange reserves). Also, the trade balance registered a huge deficit of 4.8 percent of GDP. After several internal and external events –political shocks and increases in the U.S. interest rate– that rocked Mexico, there was a consequent massive decline in Mexican foreign-exchange reserves, which were insufficient to defend the value of the peso. All of this contributed to the devaluation of the peso when the exchange rate was allowed to float freely on 22 December. In 1995, the GDP fell by 6.17 percent. It can be taken for granted that both the real appreciation that took place prior to 1994, and the subsequent real depreciation, would have affected incentives for imports.

In response to the severe exchange rate crisis, again an orthodox stabilisation package was introduced, with the focus on cutting domestic absorption. President Zedillo's administration (1994-2000) neither applied restrictive trade measures nor attempted renegotiations of NAFTA. The recovery from the 1995 crisis was fast, in part due to the stabilisation programme and the financial package engineered by the US Treasury, the IMF, and other multilateral financial institutions. However, trade balance was registering deficits while the domestic currency was appreciating instead of depreciating (as might have been expected). This fact leads us to think that not only was there an exchange rate problem, but also some structural weaknesses, which were probably accentuated with the opening of the economy.

For the purposes of the analysis here, the year when NAFTA started is considered as an institutional break point that influenced the evolution of trade policy, although it is necessary to remember that after NAFTA negotiations were announced in 1991 the trade sector was steadily improving its production processes.[11] The following sections analyse the influence of trade liberalisation on exports, imports and the trade balance. We consider different break points in the econometric study in order to test their statistical significance.

4. The Model and Econometric Techniques

This section presents the import demand model and describes different approaches that we are going to use in order to evaluate the impact of trade reforms on imports. The estimation of a standard import function requires the inclusion of two shift dummy variables, and in addition we use an import duty ratio as an indicator of trade distortion. The complete function is built up step by step.

Initially, we consider a standard import function, where imports are assumed to be a function of price competitiveness measured by the real exchange rate;[12] and, domestic income (*YM*). Assuming that the price and income elasticities of demand for imports are constant, the function can be written as (Thirlwall, 1999):

$$M = L\left(\frac{P_f E}{P_d}\right)^{\delta_1} YM^{\delta_2} \qquad (1)$$

[11] Many firms borrowed money from the commercial banks or bought new machinery in dollars on credit, in order to modernise their equipment and to be able to compete and satisfy the wider market. When the 1994 devaluation occurred, they went bankrupt.

[12] The real exchange rate is defined as $RER = E\left(\frac{P_f}{P_d}\right)$, where *E* is the nominal exchange rate (quantity of pesos per one US dollar), P_f represents US's prices and P_d is Mexico's prices. An increase in the RER represents depreciation.

where L is a constant, P_d are domestic prices, P_f are US prices, E is the nominal exchange rate, and YM is Mexico's income; δ_1 and δ_2 denote the price and income elasticities, respectively. Taking logs of the variables in equation (1) and differentiating with respect to time, the rate of growth of imports (including a constant) is:

$$m = \lambda + \delta_1 (p_f + e - p_d) + \delta_2 ym \tag{2}$$

It is expected that the price elasticity (δ_1) is negative and the income elasticity (δ_2) is positive. Considering the lagged adjustment in a disequilibrium model of import demand, it is assumed that imports adjust only partially to the difference between import demand in period t and the actual flow of imports in the previous period (t-1). The dynamic import function is expressed as:

$$m_t = \lambda + \delta_1 p_t + \delta_2 ym_t + \delta_3 m_{t-1} + \varepsilon_t \tag{3}$$

where p_t is the rate of change of the real exchange rate, ε_t is the error term and t represents the time period. The short run price and income elasticities are given by δ_1 and δ_2, and the long run elasticities by $\left(\frac{\delta_1}{1-\delta_3}\right)$ and $\left(\frac{\delta_2}{1-\delta_3}\right)$, respectively.

For the purposes of this section the import demand model, represented by equation (3), is extended with the inclusion of the ratio of import duties to total imports, which captures trade distortions. Additionally, two shift dummy variables are considered, one for the first period of trade reforms and the other for the second period of trade reforms. Each dummy

variable takes the value of zero prior to liberalisation and one afterwards.[13] Tests showed that the most significant breaks, related to trade reforms, in the case of imports occurred in 1985 and 1994. Thus, the extended import demand function can be expressed as:

$$m_t = \lambda + \delta_1 p_t + \delta_2 ym_t + \delta_3 m_{t-1} + \delta_4 md_t + \delta_5 lib85_t + \delta_6 lib94_t + \varepsilon_t \quad (4)$$

where *md* is the import duties ratio, which measures how the degree of distortions on trade may discourage imports; and, *lib85* and *lib94* are the shift dummy variables.

We are going to use different approaches to estimate the import growth function. Ordinary Least Square (OLS) methodology, as the most standard approach for time series analysis, is applied. In order to test for structural breaks in the import demand function coefficients we use different techniques, such as the Chow Test, Rolling Regressions and Outside Sample Forecasts. Finally, Autoregressive Distributed Lag Models (ARDL) and Error Correction Models (ECM) are estimated in order to test for cointegration among the variables and speed of adjustment of imports after they are affected by an external shock, respectively.

5. Impact of Trade Reforms on Imports at the Aggregate Level

This section examines the effects of trade liberalisation on Mexican import performance at the aggregate level. We will try to see whether any impact can be discerned from trade liberalisation on import growth.

[13] The argument for using a 'continuous' dummy variable is that although serious trade liberalisation started in the selected year, more reforms continued over the following years, and the impact was continuous.

i) OLS Method

The first method that we use to investigate the relationship between imports and trade reforms is the OLS method. We use annual data from 1970 to 2000 for the first two classifications, and data from 1980 to 1999 for the third classification. The data source is the Instituto Nacional de Estadística Geografía e Informática (INEGI), the Banco de México, and the World Development Indicators (2002).The time series properties of the data are shown, followed by the estimations of the import growth function. We focus our analysis on the shift dummy variables, as they represent trade liberalisation indicators.

In order to avoid the possibility of spurious results it is relevant to test whether or not the variables in equation (4) are stationary. To test for unit roots of each variable in log levels and first differences, a standard Augmented Dickey Fuller (ADF) test, one lag, is performed. Table 6 (part A) presents the results. When the ADF test is applied under the assumption of a constant, all the variables in first differences are stationary. Table 6 (part B) also presents the results of the ADF test (one lag) with a constant and deterministic time trend for the variables in log levels and first differences. It can be seen that all the variables in log levels are non-stationary. In the case of first differences, the null hypothesis of non-stationarity can be rejected at the 5 percent level for all the variables.

Table 6
Unit Root Test for Stationarity

	PART A With Constant Only, sample period 1970-2000		**PART B** with Constant and Time Trend, sample period 1970-2000	
Variables	Log Level [1]	Differences[1]	Log Level [2]	Differences[2]
m	-0.34	-4.20*	-2.14	-4.35*
ym	-1.62	-3.05*	-2.56	-3.03
p	-2.90	-5.37*	-2.89	-5.29*
md	-0.94	-3.92*	-2.50	-3.90*

Notes: [1]The critical value for rejection of hypothesis of a unit root is -2.96. [2]The critical value for rejection of hypothesis of a unit root is -3.57. The asterisk (*) denotes significance at the 5 percent level.

We estimated equation (3) using the OLS method, which includes the basic determinants of an import demand model. After that, we estimated the extended model that includes the shift dummy variables, and we then end up with a complete import demand model. Table 7 shows the results.

Table 7
OLS Estimation for Import Growth: 1970-2000 [14]

Dependent variable: Import growth (*m*)						
	Equations					
Regressor	*7.1*	*7.2*	*7.3*	*7.4*	*7.5*	*7.6*
Constant	0.02 (0.62)	0.02 (0.81)	0.01 (0.42)	-0.11 (-2.06)	0.00 (0.04)	-0.11 (-1.84)
ym	1.40 (2.01)*	0.96 (1.43)	1.03 (1.31)	2.67 (3.02)*	1.05 (1.37)	2.67 (2.66)*
p	-0.82 (-4.57)*	-0.89 (-5.23)*	-0.91 (-4.98)*	-0.61 (-3.30)*	-0.90 (-5.12)*	-0.61 (-3.00)*
m_{-1}		0.21 (2.13)*	0.24 (2.14)*	0.07 (0.70)	0.21 (1.98)	0.07 (0.67)
md			-0.05 (-0.66)	-0.07 (-1.10)	-0.02 (-0.31)	-0.07 (-1.00)
lib85				0.13 (2.90)*		0.13 (2.25)*
lib94					0.07 (1.57)	0.00 (0.00)
R^2	*0.71*	*0.75*	*0.76*	*0.83*	*0.78*	*0.83*
Durbin Watson	*1.26*	*1.53*	*1.54*	*1.86*	*1.54*	*1.86*
Diagnostic Tests						
Serial Correlation	*0.074*	*0.180*	*0.207*	*0.773*	*0.258*	*0.776*
Functional Form	*0.077*	*0.601*	*0.463*	*0.471*	*0.231*	*0.456*
Normality	*0.137*	*0.546*	*0.600*	*0.619*	*0.581*	*0.619*
Heteroscedasticity	*0.243*	*0.160*	*0.326*	*0.104*	*0.142*	*0.103*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. The diagnostic tests show probabilities.

The evidence presented in Table 7 shows that the trade reforms launched during 1985 influenced positively the growth of imports. Effectively, *lib85*, as an indicator of trade liberalisation, is statistically significant in all equations at the 5 percent level. The effect of *lib85* is to raise import growth by 13 percentage points. The econometric results tell us that none of the coefficients given by the second indicator of trade liberalisation, *lib94,* are statistically significant.

[14] Income and price slope dummies (i.e. *ym*lib85*, *ym*lib94*, *p*lib85*, *p*lib94;* designed to capture the effects of the elimination of trade distortions on the income and price elasticities of demand) were included in the import equation, but the results showed that the variables were not statistically different from zero (results not reported here).

The import duty ratio coefficients have the correct sign but are not significant in any equation. This variable seems to have had no independent effect on Mexican imports. The import demand estimations are characterised by the strong significance of the real exchange rate variable. All the price elasticity estimates fall within the range from –0.61 to –0.91. As regards the income elasticity, it is not always statistically significant, but it is modestly high when it is significant. The lagged dependent variable is just significant in two equations (*7.2*) and (*7.3*), giving long run elasticities slightly higher than the short run elasticities.

Equation (*7.6*) may be the best estimation that represents import growth. The explanatory variables account for 83 percent of the variance of imports, and it passes the diagnostic tests. This equation shows that the shift dummy variable for 1985 behaves as expected indicating that the trade liberalisation launched in 1985 increased import growth by 13 percentage points. By contrast, the shift dummy variable for 1994 does not show significant effect of NAFTA on imports. Income and price elasticities are within the range of the value of other results (Moreno-Brid, 1999b; Sotomayor, 1997). The income elasticity shows that a one percent increase in national income increases imports by 2.6 percent; while a one percent depreciation of the currency reduces imports by 0.61 percent.

It is important to point out that we tried other dates for the dummy variables, as we did for the export function. We considered 1986 (*lib86*) and 1987 (*lib87*) instead of 1985 (*lib85*) as the first trade liberalisation indicator (see Table A1 and A2 in the Appendix). The *lib86* coefficient is significant through almost all equations, except equation (A1.2). The effect

of *lib86* on imports is similar to *lib85*, which varies from 11 percentage points to 15 percentage points.

As regards the second trade liberalisation indicator, *lib94*, we considered the two subsequent years after NAFTA was launched. We substitute 1995 (*lib95*) and 1996 (*lib96*) for 1994 (*lib94*). However, none of them is significant (examine Table A1 and A2 in the Appendix).

ii) Structural Stability, Rolling Regressions and Forecasts

To supplement our previous analysis, we also use additional techniques for analysing whether or not a structural break in import growth can be identified in 1985 and 1994: structural stability, rolling regressions and outside-sample forecasts.

First, we apply the Chow breakpoint test to see if there is statistical evidence for structural stability of the parameters. In this case, we consider 1985 as a breakpoint. The Chow breakpoint test leads us to reject the null hypothesis of structural stability in the model of imports at the 5 percent level of significance. The calculated value of the F-statistic, 16.01, is greater than the critical value, 3.01. This result supports the finding that in 1985 there was a structural change in Mexican import growth.

The second procedure is to use the technique of rolling regression to examine parameter variation over time. In Table 8 we present seventeen rolling regressions of the simplest import model (equation 2). The sample size is 14 years. In general, the constant has been

shifting upwards, from negative to positive values. The income elasticity estimate has been erratic. The elasticity was smoothly falling for the first eight rolling regressions, and then it recovers for the next three regressions, and once more decreases for the regression 1982-95. This elasticity recovered once again for the period 1983-96, but it fell for next two regressions, and then, it recovered for the last two regressions. From these results it could be argued that after the trade liberalisation of 1985 imports became less sensitive to domestic income, but there is an unclear pattern to what happened once NAFTA was announced.

Table 8
Rolling Regressions for Imports (window size 14)

Dependent variable: Import growth rate (m)									
Period	1971-84	1972-85	1973-86	1974-87	1975-88	1976-89	1977-90	1978-91	1979-92
constant	-0.16 (-4.78)*	-0.12 (-3.04)*	-0.05 (-0.89)	-0.04 (-0.76)	-0.01 (-0.23)	0.001 (0.04)	0.004 (0.10)	0.003 (0.07)	0.004 (0.10)
ym	3.81 (6.77)*	3.40 (4.90)*	2.36 (2.17)*	2.20 (2.02)*	1.69 (1.72)	1.79 (1.99)	1.83 (2.01)*	1.99 (2.19)*	2.12 (2.23)*
p	-0.74 (-5.19)*	-0.82 (-4.56)*	-0.76 (-2.59)*	-0.79 (-2.71)*	-0.95 (-3.83)*	-0.99 (-4.39)*	-0.98 (-4.25)*	-0.91 (-3.82)*	-0.90 (-3.86)*

Period	1980-93	1981-94	1982-95	1983-96	1984-97	1985-98	1986-99	1985-00
constant	-0.00 (-0.07)	0.00 (0.01)	0.02 (0.63)	0.01 (0.43)	0.09 (3.98)*	0.09 (4.02)*	0.08 (3.43)*	0.08 (3.43)*
ym	2.19 (2.02)*	2.32 (1.85)	1.92 (1.24)	3.63 (2.55)*	0.84 (1.06)	0.82 (1.10)	0.95 (1.23)	1.00 (1.37)
p	-0.88 (-3.65)*	-0.84 (-3.34)*	-0.71 (-2.45)*	-0.14 (-0.43)	-0.55 (-3.12)*	-0.57 (-3.31)*	-0.53 (-3.04)*	-0.54 (-3.10)*

Note: The asterisk (*) denotes significance at the 5 percent.

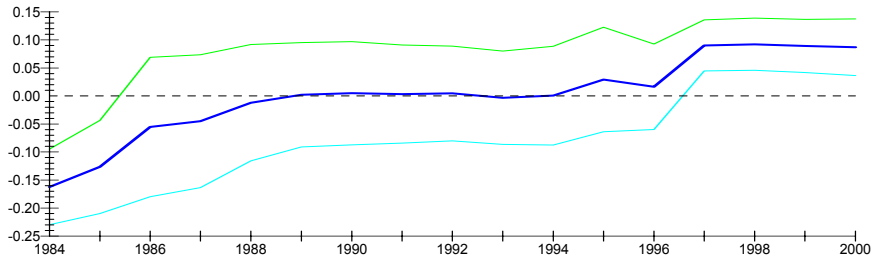
The price elasticity has always been significant and more or less stable. There is no big difference in the parameters if we compare their values for the samples before and after trade liberalisation took place (i.e. for 1985, compare the periods 1971-84 and 1973-86; for 1994, contrast 1980-93 and 1982-95).[15]

[15] We cannot say that there has been an income or price elasticity increase or decrease due to overlapping periods.

The rolling coefficients presented in Table 8 are plotted in Graph 4. We observe *constant*, *ym* and *p* coefficients in panels (a), (b) and (c), respectively. All the rolling coefficients are within their standard error band. The changes in the parameters are clearer in the plots than in the table.

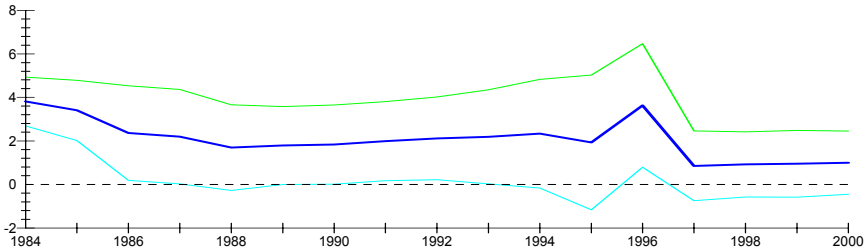
Graph 4
Rolling Coefficients for Imports

Coefficient of *Constant* and its two*S.E. bands based on rolling OLS



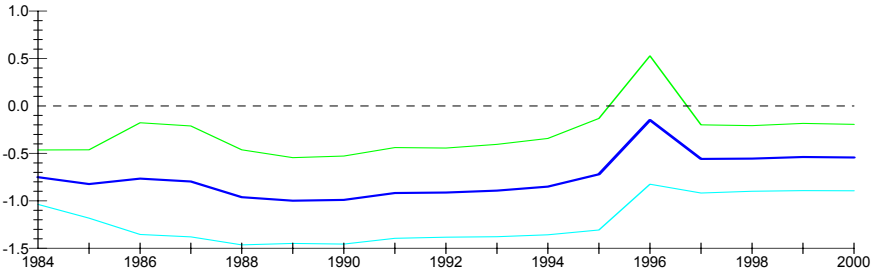
(a)

Coefficient of *ym* and its two*S.E. bands based on rolling OLS



(b)

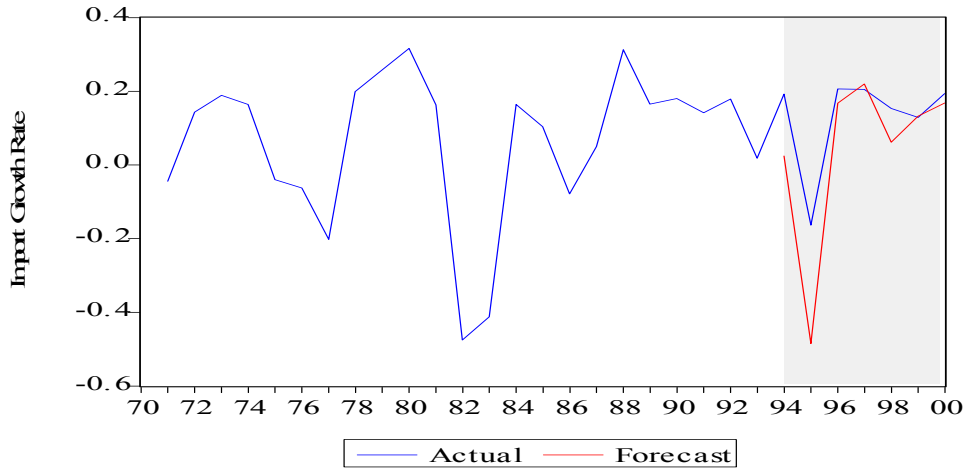
Coefficient of *p* and its two*S.E. bands based on rolling OLS



(c)

Our third, procedure to test for the effect of NAFTA on imports is to estimate the import model up to 1994 and then to make outside sample forecasts. If there is some evidence of a structural break related to NAFTA, we expect actual import growth to be greater than predicted. The actual and the forecast imports are shown in Graph 5. As we can observe, the actual import performance exceeds the forecast from 1994 to 1996. The forecast model under-predicts actual imports, markedly in 1995 and in 1998. Then, NAFTA represented a structural break for imports, which was prolonged by the Mexican financial crisis in 1995.

Graph 5
Actual, and Single Equation Static Forecast for Imports



From the import forecast evaluation, we observe that the *rms* forecast error is small, but the bias proportion is modestly large, which implies that a bias is present.

Imports Forecast Evaluation	
Root-mean square error (*rms*)	0.137411
Theil inequality coefficient	0.337362
Bias proportion	0.361163
Variance proportion	0.524776
Covariance proportion	0.114061

In the next sub-section we are going to test for the existence of a long run relationship among the variables that explain the import growth model. Also, we are interested in estimating the speed of adjustment of the model once it is disturbed by a shock.

iii) Autoregressive Distributed Lag and Error Correction Modelling

In this section we estimate the short and long run coefficients of the import demand model using the ARDL procedure. Also, we present the error correction model.

The ARDL process implies two steps Pesaran and Shin (1995). First, the existence of a long run relationship among the variables under consideration is examined. The F-statistic is used for this purpose. If the calculated F-statistic is higher than the upper bound critical value, it suggests rejection of the null hypothesis of no long run relationship. Then, after testing for the existence of such a long run relationship, the long and short run parameters are estimated by using the ARDL method.

In this case, the calculated F statistic is 4.57. Comparing with the interval of critical values (from 3.21 to 4.37), under the assumption of an intercept and no trend, it is above the upper critical value, allowing us to reject the null hypothesis of no long run relationship between the variables at the 5 percent significance level.

Having tested that the long run relationship between the variables is not spurious, we then estimated the long run coefficients and the ECM.[16] We consider one lag length,[17] and then the order of the ARDL model is determined by using the Schwartz Bayesian Criterion (SBC). The long run coefficients and the ECM derived from the ARDL (1,1,1) approach are the following, respectively:[18]

$$LM = \underset{(-0.22)}{-1.58} + \underset{(3.92)}{1.04}\, LYM - \underset{(-2.79)}{1.06}\, LP + \underset{(2.99)}{0.64}\, lib85 + \underset{(4.41)}{0.62}\, lib94 \qquad (5)$$

$$m = \underset{(-0.22)}{-0.49} + \underset{(3.98)}{2.60}\, ym - \underset{(-3.79)}{0.70}p + \underset{(4.05)}{0.20}\, lib85 + \underset{(2.96)}{0.19}\, lib94 - \underset{(-3.43)}{0.31}\, ecm_{-1} \qquad (6)$$

where the *L* preceding the variables, in equation (5), stands for the log of the variable; and, the dependent and the first two independent variables in equation (6), which are in lower cases, represent growth rates.

The two long run trade liberalisation coefficients, *lib85* and *lib94*, in equation (5) are significant at the 5 percent level, suggesting that given changes in domestic income and relative prices, imports highly increased by approximately 87 percentage points.[19]

The ECM, in equation (6), shows the short run coefficients of the variables and the error correction term. Except for the constant coefficient, the parameters are statistically significant. The error correction coefficient, estimated at 0.31, is statistically significant, has the correct sign and suggests a moderate speed of convergence to equilibrium.

[16] In the following equations we do not include the import duties ratio as an explanatory variable. In any case it is not statistically significant, and the remaining coefficients show better results if we do not consider it.
[17] We are constrained to use one lag due to the small sample size considered.
[18] Both models satisfy all diagnostic tests.
[19] This value is calculated from $e^{\beta-1}$, where β is the value of the coefficient.

In sum, at the aggregate level there is evidence that the trade reforms during the mid-1980s increased the growth of imports into the Mexican economy. Also, we found some evidence for structural break related to NAFTA using the outside sample forecasting method and when estimating the long run relationship using ARDL models.

The following section analyses the impact of trade reforms by sector. We are interested in identifying the sectors where trade reforms had the greatest impact on imports. The results presented in the next section, however, should be taken cautiously due to the relatively small sample size used.

6. Impact of Trade Reforms on Imports at a Disaggregated Level

The aim of this section is to differentiate the effects of two periods of trade reforms on Mexican imports at a disaggregated level. For this purpose we consider three different classifications of imports. Classification 1 is related to Farming, Extractive and Manufacturing sectors. Classification 2 refers to Consumer and Capital goods. Classification 3 deals with nine sub-sectors that comprise the manufacturing sector: Food Products, Beverages and Tobacco; Textiles and Leather Products; Wood Products; Paper Products, Publishing and Printing; Chemicals, Rubber and Plastic Products; Non-Metallic Mineral Products; Basic Metals; Machinery and Equipment; and, Other Products.

i) OLS Method

In order to estimate the import model at a disaggregated level, using the OLS, and to avoid the possibility of spurious results, the ADF test was applied to the different sectors and

sub-sectors under consideration. We use annual data from 1980 to 2000 for the first two classifications, and data from 1980 to 1999 for the third classification.

Unit root tests for stationarity are performed on the log levels of the variables and first differences. Table 9 (part A) presents the results of the ADF test (one lag) and the Phillips-Perron unit root test under the assumption of a constant. All the variables are integrated of order one, I(1), at the 5 percent or 10 percent level of significance

Table 9
Unit Root Test for Stationarity

	PART A with Constant Only		**PART B with Constant and Time Trend**	
Variables	Log Level [1]	Differences[1]	Log Level [2]	Differences[2]
Farming Imports	-0.91	-4.68*	-3.75*	-4.45*
Extractive Imports	-0.45	-3.17*	-3.50**	-3.38**
Manufacturing Imports	-0.08	-3.91*	-5.17*	-3.98*
Consumer Goods	-0.78	-3.25*	-3.75*	-3.21
Intermediate Goods	0.19	-4.26*	-5.15*	-4.30*
Capital Goods	-0.67	-3.24*	-4.55*	-3.39**
Food Products, Beverages and Tobacco[3]	-0.84	-2.98**	-2.32	-2.98
Textiles and Leather Products	-0.26	-3.14*	-3.58**	-3.20
Wood Products	-0.75	-2.76**	-2.96	-2.61
Paper Products, Publishing and Printing	-0.40	-3.09*	-4.26*	-2.81
Chemicals, Rubber and Plastic Products	0.12	-4.02*	-4.45*	-4.22*
Non-Metallic Mineral Products	-0.78	-3.46*	-4.76*	-3.43**
Basic Metals	-0.73	-5.87*	-5.36*	-6.64*
Machinery and Equipment	-0.17	-3.90*	-5.14*	-4.01*
Other Products	-0.55	-3.70*	-3.84*	-3.63**

Notes: [1]The critical value for rejection of hypothesis of a unit root is -3.02. [2]The critical value for rejection of hypothesis of a unit root is -3.67. [3]The Phillips-Perron unit root test was applied for this manufacturing sub-sector. The asterisk (*) denotes significance at the 5 percent level. The double asterisk (**) denotes significance at the 10 percent level.

Table 9 (part B) also presents the results of the ADF (one lag) and the Phillips-Perron unit root test with a constant and deterministic time trend for the variables both in levels and first differences. It can be seen that almost all variables, except imports for the Food, Beverages and Tobacco sub-sector, and the Wood Products sub-sector, in log levels are

stationary. In the case of first differences, the null hypothesis of non-stationarity can be rejected at the 5 percent or 10 percent level for the import of five sectors (Farming; Extractive; Manufacturing; Intermediate Goods; Capital Goods); and, five manufacturing sub-sectors (Chemicals, Rubber and Plastic Products; Non-Metallic Mineral Products; Basic Metals; Machinery and Equipment; and, Other Products).

We present regressions using the OLS for the three different classifications of imports. Table 10 shows the results for the first classification. Different specifications were estimated in order to know how each variable behaves when more explanatory variables are included. We started estimating the simple static model and we ended with a complete dynamic one. Four factors should be mentioned. First, the shift dummy variable for 1985 is positive and significant at the 5 percent confidence level for manufacturing imports (equation *10.13*). It suggests, c*eteris paribus*, that the mid-1980s trade reforms increased manufacturing import growth by 30 percentage points. Second, the shift dummy variable for 1994 is not significant at all. Third, price elasticities show the expected sign. They are statistically significant for farming and manufacturing equations, where the magnitude of the coefficients is relatively high. Regarding income elasticities they are not significant for any equation. Fourth, the shift dummy variable for 1991, which was included to capture the change in the way the data were compiled since that year, is not significant.

Table 10
OLS Estimation for Disaggregated Import Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib 85*	*lib94*	*d91*		R^2
Farming Imports	*10.1*	0.10 (1.48)	-2.78 (-1.44)	-1.82 (-4.19)*				-0.13 (-0.58)		*0.58*
	10.2	0.08 (1.46)	-1.51 (-0.89)	-1.78 (-5.12)*	-0.46 (-3.50)*			-0.15 (-0.84)		*0.77*
	10.3	0.06 (0.54)	-1.57 (-0.88)	-1.77 (-4.89)*	-0.46 (-3.38)*	0.02 (0.22)		-0.15 (-0.83)		*0.78*
	10.4	0.05 (0.94)	-2.65 (-1.54)	-1.93 (-5.73)*	-0.45 (-3.66)*		0.14 (1.71)	-0.09 (-0.52)		*0.82*
	10.5	0.08 (0.78)	-2.65 (-1.48)	-1.96 (-5.48)*	-0.45 (-3.48)*	-0.04 (-0.33)	0.15 (1.67)	-0.08 (-0.45)		*0.82*
Extractive Imports	*10.6*	0.01 (0.24)	1.73 (0.95)	-0.14 (-0.37)				-0.19 (-0.96)		*0.20*
	10.7	0.01 (0.21)	1.55 (0.83)	-0.17 (-0.43)	0.17 (0.71)			-0.18 (-0.89)		*0.22*
	10.8	-0.16 (-1.10)	1.31 (0.72)	-0.05 (-0.13)	-0.09 (-0.31)	0.22 (1.32)				*0.32*
	10.9	-0.01 (-0.17)	0.67 (0.34)	-0.29 (-0.73)	0.10 (0.43)		0.12 (1.20)	-0.13 (-0.65)		*0.30*
	10.10	-0.15 (-1.01)	0.67 (0.34)	-0.17 (-0.40)	-0.10 (-0.32)	0.18 (1.04)	0.09 (0.91)	-0.17 (-0.83)		*0.36*
Manufacturing Imports	*10.11*	0.01 (0.26)	2.83 (1.55)	-0.73 (-1.96)				0.29 (1.53)		*0.66*
	10.12	0.02 (0.36)	1.79 (0.95)	-0.93 (-2.45)*	0.24 (1.50)			0.26 (1.42)		*0.71*
	10.13	-0.22 (-1.61)	2.46 (1.40)	-0.56 (-1.42)	-0.06 (-0.31)	0.30 (1.90)**		0.27 (1.62)		*0.78*
	10.14	0.00 (0.13)	1.38 (0.67)	-1.00 (-2.47)*	0.25 (1.51)		0.06 (0.62)	0.28 (1.48)		*0.72*
	10.15	-0.26 (-1.61)	2.93 (1.41)	-0.44 (-0.92)	-0.13 (-0.49)	0.36 (1.77)	-0.05 (-0.47)	0.25 (1.44)		*0.78*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level, and the double asterisk (**) denotes significance of the coefficient at the 10 percent level. See diagnostic test in Table A3 in the Appendix.

Even considering other years related to the first period of trade reforms, 1986 and 1987, we do not obtain more significant results. Regarding the second period of trade liberalisation we tested for 1995 and 1996, but none of these years show positive and significant coefficients (see Table A4 and Table A5 in the Appendix).

The results using OLS for the second classification of imports are presented in Table 11.

Table 11
OLS Estimation for Disaggregated Import Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib85*	*lib94*	*d91*		R^2
Consumer Goods	*11.1*	-0.00 (-0.06)	4.60 (1.73)	-1.33 (-2.45)*				-0.17 (-0.63)		*0.69*
	11.2	0.02 (0.27)	2.82 (1.10)	-1.67 (-3.24)*	0.29 (2.03)*			-0.26 (-1.04)		*0.76*
	11.3	-0.11 (-0.57)	3.04 (1.16)	-1.51 (-2.64)*	0.19 (1.02)	0.16 (0.75)		-0.25 (-0.97)		*0.78*
	11.4	0.03 (0.36)	3.16 (1.12)	-1.62 (-2.92)*	0.28 (1.90)		-0.04 (-0.35)	-0.28 (-1.05)		*0.77*
	11.5	-0.19 (-0.89)	4.26 (1.44)	-1.21 (-1.84)	0.10 (0.46)	0.29 (1.13)	-0.14 (-0.91)	-0.29 (-1.09)		*0.79*
Intermediate Goods	*11.6*	0.06 (1.29)	0.97 (0.68)	-0.84 (-2.91)*				0.42 (2.84)*		*0.73*
	11.7	0.05 (1.27)	0.29 (0.19)	-0.94 (-3.19)*	0.17 (1.23)			0.42 (2.90)*		*0.76*
	11.8	-0.11 (-1.11)	0.68 (0.49)	-0.74 (-2.54)*	-0.05 (-0.27)	0.22 (1.86)**		0.40 (2.99)*		*0.81*
	11.9	0.03 (0.77)	-0.37 (-0.24)	-1.04 (-3.55)*	0.18 (1.33)		0.10 (1.39)	0.46 (3.22)*		*0.79*
	11.10	-0.09 (-0.82)	0.28 (0.17)	-0.82 (-2.49)*	-0.00 (-0.00)	0.17 (1.27)	0.05 (0.61)	0.42 (2.96)*		*0.82*
Capital Goods	*11.11*	-0.05 (-0.84)	4.72 (2.49)*	-0.68 (-1.78)				0.02 (0.12)		*0.71*
	11.12	-0.03 (-0.50)	3.53 (1.78)	-0.98 (-2.34)*	0.23 (1.49)			-0.05 (-0.27)		*0.75*
	11.13	-0.31 (-2.32)*	4.22 (2.41)*	-0.52 (-1.27)	-0.03 (-0.21)	0.32 (2.28)*		0.00 (0.04)		*0.82*
	11.14	-0.03 (-0.58)	3.27 (1.50)	-1.02 (-2.29)*	0.24 (1.47)		0.03 (0.38)	-0.04 (-0.19)		*0.75*
	11.15	-0.36 (-2.44)*	4.96 (2.50)*	-0.33 (-0.69)	-0.11 (-0.54)	0.39 (2.36)*	-0.08 (-0.83)	-0.00 (-0.03)		*0.83*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level, and the double asterisk (**) denotes significance of the coefficient at the 10 percent level. See diagnostic test in Table A6 in the Appendix.

Four main aspects should be mentioned. First, the shift dummy variable for 1985 is positive and significant at the 5 percent level for capital goods (equations *11.13* and *11.15*) and significant at the 10 percent for intermediate goods (equation *11.8*); while, none of the coefficients relating to the second period of trade reforms is significant. Second, income elasticities are significant for capital goods, showing a relatively high magnitude. Third, the price elasticity shows the expected sign and is significant for almost all equations. This evidence may suggest that Mexican imports are mainly determined by price. Finally, the

coefficients relating to the shift dummy variable for 1991 are significant for all intermediate goods equations.

Trying different years, 1986 and 1987, for the first period of trade reforms, we do not find significant effects. Neither 1995 nor 1996 exhibit significant results for the second period of trade reforms related to NAFTA (see Table A7 and A8 in the Appendix). The price elasticity is the only variable that remains significant for almost all equations.

The results from OLS estimations for the third classification of imports are reported in Table 12. Two main aspects should be highlighted. First, the shift dummy variable for 1985 is positive and significant at the 5 percent confidence level for the Machinery and Equipment sub-sector (equation *12.38*), suggesting that imports of this manufacturing sub-sector increased by 35 percentage points as a consequence of the mid-1980s trade reforms.[20] Precisely, in this manufacturing sub-sector, the most dynamic, is where the automobile industry and auto parts industry is classified. Multinational enterprises like General Motors, Toyota, Ford, VolksWagen have increased their activities after the mid-1980s. None of the coefficients for the second period of trade reforms, *lib94*, is significant.

[20] Although the Textiles and Leather Products manufacturing sub-sector show positive and significant coefficients for *lib85* (equations *12.8* and *12.10*), we do not rely on these results because when *lib85* is included the sign for the price elasticity changes to positive, and this is not compatible with the theory.

Table 12
OLS Estimation for Disaggregated Import Growth: 1980-1999

Dependent variable : m^i										
Variable / m^i	Eq.	*Constant*	*ym*	*p*	m^i_{-1}	*lib85*	*lib94*	*d91*		R^2
Food Products, Beverages and Tobacco	*12.1*	-0.03 (-0.56)	3.06 (1.70)	-0.56 (-1.45)				-0.16 (-0.96)		*0.80*
	12.2	-0.02 (-0.42)	2.04 (1.34)	-0.67 (-2.09)*	0.28 (2.68)*			-0.22 (-1.56)		*0.87*
	12.3	-0.13 (-1.43)	1.92 (1.31)	-0.62 (-2.00)*	0.20 (1.77)	0.13 (1.41)		-0.22 (-1.62)		*0.89*
	12.4	-0.01 (-0.34)	2.12 (1.27)	-0.66 (-1.94)	0.27 (2.52)*		-0.01 (-0.15)	-0.22 (-1.50)		*0.87*
	12.5	-0.15 (-1.62)	2.38 (1.53)	-0.54 (-1.65)	0.15 (1.27)	0.19 (1.69)**	-0.07 (-0.95)	-0.24 (-1.77)		*0.90*
Textiles and Leather Products	*12.6*	0.02 (0.17)	6.24 (1.22)	-0.77 (-0.74)				0.39 (0.74)		*0.37*
	12.7	0.02 (0.16)	6.14 (1.10)	-0.79 (-0.69)	0.01 (0.05)			0.39 (0.71)		*0.37*
	12.8	-0.68 (-1.81)	7.19 (1.44)	0.16 (0.14)	-0.38 (-1.36)	0.90 (2.08)*		0.35 (0.70)		*0.54*
	12.9	0.04 (0.24)	6.71 (1.10)	-0.70 (-0.58)	0.00 (0.03)		-0.08 (-0.28)	0.36 (0.62)		*0.38*
	12.10	-0.90 (-2.45)*	10.87 (2.15)*	1.09 (0.94)	-0.59 (-2.07)*	1.32 (2.83)*	-0.48 (-1.76)	0.14 (0.30)		*0.64*
Wood Products	*12.11*	-0.00 (-0.00)	4.45 (1.82)	-1.04 (-2.10)*				0.62 (2.41)*		*0.73*
	12.12	0.00 (0.00)	3.83 (1.55)	-1.17 (-2.32)*	0.16 (1.14)			0.55 (2.15)*		*0.75*
	12.13	-0.07 (-0.40)	3.82 (1.49)	-1.10 (-2.02)*	0.11 (0.60)	0.09 (0.45)		0.56 (2.11)*		*0.76*
	12.14	0.02 (0.30)	4.70 (1.75)	-1.03 (-1.95)	0.13 (0.89)		-0.11 (-0.88)	0.52 (1.98)		*0.77*
	12.15	-0.06 (-0.41)	5.16 (1.83)	-0.86 (-1.44)	0.05 (0.31)	0.14 (0.70)	-0.18 (-1.11)	0.50 (1.85)		*0.78*
Paper Products, Publishing and Printing	*12.16*	0.05 (0.92)	1.30 (0.73)	-0.55 (-1.53)				0.37 (2.00)*		*0.53*
	12.17	0.03 (0.65)	0.96 (0.55)	-0.61 (-1.74)	0.26 (1.46)			0.36 (2.04)*		*0.59*
	12.18	-0.15 (-1.22)	0.76 (0.47)	-0.46 (-1.36)	-0.03 (-0.12)	0.26 (1.69)**		0.35 (2.08)*		*0.67*
	12.19	0.03 (0.53)	0.86 (0.45)	-0.62 (-1.66)	0.26 (1.41)		0.01 (0.14)	0.37 (1.95)		*0.59*
	12.20	-0.08 (-0.83)	1.32 (0.71)	-0.42 (-1.08)	0.05 (0.23)	0.20 (1.43)	-0.07 (-0.66)	0.31 (1.66)		*0.66*
Chemicals, Rubber and Plastic Products	*12.21*	0.06 (1.38)	1.84 (1.38)	-0.57 (-2.10)*				0.29 (2.10)*		*0.68*
	12.22	0.05 (1.24)	1.58 (1.09)	-0.61 (-2.12)*	0.08 (0.54)			0.29 (2.06)*		*0.69*
	12.23	-0.04 (-0.43)	1.75 (1.21)	-0.49 (-1.59)	-0.06 (-0.31)	0.13 (1.12)		0.28 (1.97)		*0.72*
	12.24	0.04 (0.94)	1.29 (0.81)	-0.66 (-2.14)*	0.09 (0.57)		0.04 (0.56)	0.31 (2.08)*		*0.70*
	12.25	-0.04 (-0.38)	1.73 (1.04)	-0.49 (-1.37)	-0.06 (-0.26)	0.13 (0.91)	0.00 (0.02)	0.28 (1.82)		*0.72*

(Continue overleaf)

(Continued)

Variable / m^i	Eq.	Constant	*ym*	*p*	m^i_{-1}	*lib85*	*lib94*	*d91*		R^2
Non-Metallic Mineral Products	*12.26*	0.00 (0.07)	2.45 (0.87)	-1.06 (-1.86)				0.40 (1.36)		*0.56*
	12.27	0.01 (0.13)	1.88 (0.60)	-1.15 (-1.86)	0.09 (0.46)			0.38 (1.28)		*0.56*
	12.28	-0.38 (-1.61)	2.98 (1.01)	-0.65 (-1.02)	-0.25 (-0.95)	0.46 (1.80)**		0.39 (1.40)		*0.66*
	12.29	-0.00 (-0.05)	1.26 (0.37)	-1.24 (-1.90)	0.09 (0.48)		0.09 (0.57)	0.42 (1.33)		*0.57*
	12.30	-0.42 (-1.58)	3.61 (1.04)	-0.50 (-0.67)	-0.30 (-0.99)	0.53 (1.67)	-0.06 (-0.39)	0.36 (1.23)		*0.66*
Basic Metals	*12.31*	0.01 (0.11)	3.01 (0.87)	-1.28 (-1.82)				0.32 (0.88)		*0.52*
	12.32	0.01 (0.12)	2.85 (0.76)	-1.32 (-1.73)	0.03 (0.16)			0.32 (0.86)		*0.52*
	12.33	-0.18 (-0.63)	2.96 (0.78)	-1.10 (-1.34)	-0.09 (-0.35)	0.24 (0.76)		0.28 (0.73)		*0.54*
	12.34	-0.01 (-0.10)	1.99 (0.49)	-1.44 (-1.80)	0.03 (0.18)		0.13 (0.66)	0.37 (0.95)		*0.54*
	12.35	-0.14 (-0.49)	2.42 (0.56)	-1.23 (-1.32)	-0.05 (-0.20)	0.18 (0.49)	0.08 (0.34)	0.32 (0.77)		*0.55*
Machinery and Equipment	*12.36*	0.02 (0.44)	2.98 (1.46)	-0.68 (-1.65)				0.30 (1.44)		*0.61*
	12.37	0.03 (0.48)	1.87 (0.86)	-0.93 (-2.07)*	0.22 (1.27)			0.26 (1.27)		*0.65*
	12.38	-0.25 (-1.67)	2.72 (1.37)	-0.44 (-0.95)	-0.10 (-0.46)	0.35 (2.05)*		0.29 (1.55)		*0.74*
	12.39	0.01 (0.24)	1.39 (0.59)	-1.01 (-2.11)*	0.24 (1.29)		0.06 (0.61)	0.29 (1.33)		*0.66*
	12.40	-0.29 (-1.71)	3.37 (1.43)	-0.27 (-0.48)	-0.18 (-0.66)	0.42 (1.95)**	-0.06 (-0.56)	0.27 (1.39)		*0.75*
Other Products	*12.41*	-0.01 (-0.12)	7.52 (1.99)	-0.92 (-1.20)				0.15 (0.39)		*0.58*
	12.42	-0.01 (-0.14)	6.59 (1.69)	-1.16 (-1.44)	0.17 (0.96)			0.13 (0.32)		*0.61*
	12.43	-0.28 (-0.89)	6.77 (1.72)	-0.81 (-0.89)	0.00 (0.01)	0.33 (0.91)		0.12 (0.30)		*0.63*
	12.44	0.00 (0.02)	7.23 (1.69)	-1.06 (-1.23)	0.16 (0.88)		-0.09 (-0.45)	0.09 (0.22)		*0.62*
	12.45	-0.45 (-1.34)	8.95 (2.11)*	-0.17 (-0.17)	-0.17 (-0.59)	0.64 (1.46)	-0.30 (-1.22)	0.00 (0.00)		*0.68*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. See diagnostic test in Table A9 in the Appendix.

Second, the price variable is significant at the 5 percent confidence level, for at least one equation, in the following manufacturing sub-sectors: Food Products, Beverages and Tobacco; Wood Products; Chemicals, Rubber and Plastic Products; and, Machinery and Equipment.

Notice that in four manufacturing sub-sectors (Wood Products; Paper Products, Publishing and Printing; and, Chemicals, Rubber and Plastic Products) the shift dummy variable for 1991 is significant; which suggest that the change in the way how the data were compiled mainly affected those sub-sectors.

Similarly as we did for the other two classifications of imports, we consider two alternative years for each trade liberalisation indicator, 1986 and 1987 for the first period of trade reforms; and, 1995 and 1996 for the second period (see Table A10 and A11 in the Appendix). The results, however, do not show significant coefficients related to the alternative years considered for any of the trade liberalisation indicators.

ii) Structural Stability and Forecasts

Additional to the use of shift dummy variables, as indicators of trade liberalisation, we apply, alternatively, two techniques for examining whether or not a structural break in the growth of each type of imports can be identified in 1985 and 1994: structural stability and outside-sample forecasts.

First, we apply the Chow break point test in order to examine the statistical evidence for structural stability of the parameters for the effect of the mid-1980s trade reforms. The Chow test leads us to accept the null hypothesis of structural stability for the Farming sector and the Wood Products manufacturing sub-sector. Imports of the other sectors and sub-sectors reject the null hypothesis, as can be seen in Table 13. In other words, almost

all types of imports analysed show evidence of a structural break in 1985, most likely as a result of trade liberalisation.

Table 13
Chow Test for structural stability of the parameters

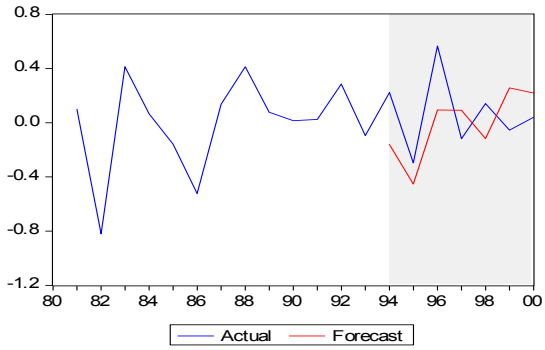
Imports Equation	*Calculated F-statistic*		*Imports Equation*	*Calculated F-statistic*
Farming	0.75		Food Products, Beverages and Tobacco	2.98**
Extractive	2.69**		Textiles and Leather Products	6.06*
Manufacturing	7.44*		Wood Products	1.24
			Paper Products, Publishing and Printing	4.18*
			Chemicals, Rubber and Plastic Products	1.94***
Consumer Goods	3.55*		Non-Metallic Mineral Products	4.41*
Intermediate Goods	3.64*		Basic Metals	1.98***
Capital Goods	6.47*		Machinery and Equipment	8.15*
			Other Products	3.06**

Notes: The asterisk (*), the double asterisk (**), and the triple asterisk (***) denote rejection of the null hypothesis of no structural change in the parameters at the 5 percent, 10 percent and 25 percent, respectively.

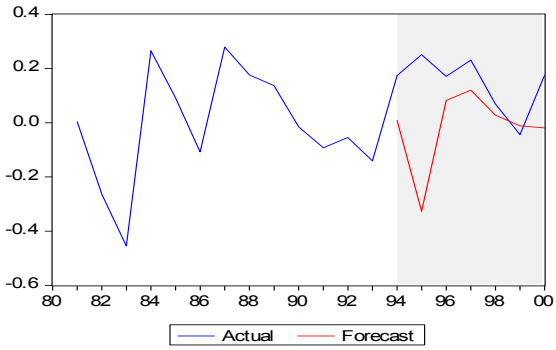
The second procedure is related to test for the effect of NAFTA for each type of imports. Import models are estimated up to 1994 and then outside-sample forecasts are made. The actual and the forecast import models are shown in Graph 6.

Graph 6
Actual and Single Equation Static Forecast for Imports

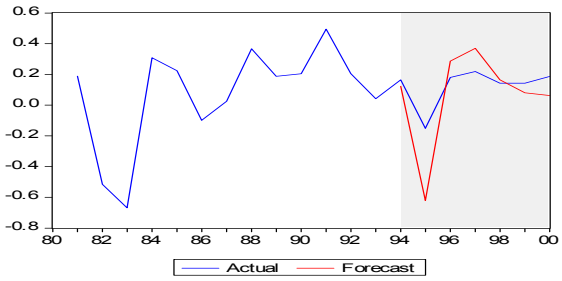
Classification 1



a) Farming Imports

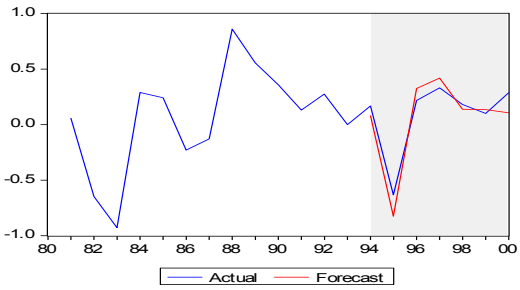


b) Extractive Imports

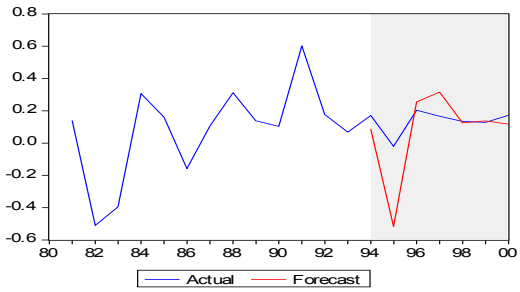


c) Manufacturing Imports

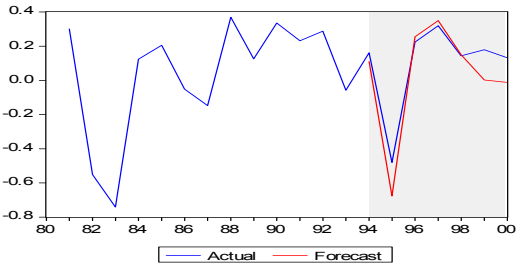
Classification 2



d) Consumer goods

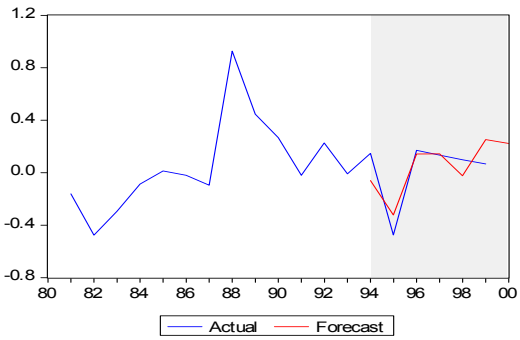


e) Intermediate goods

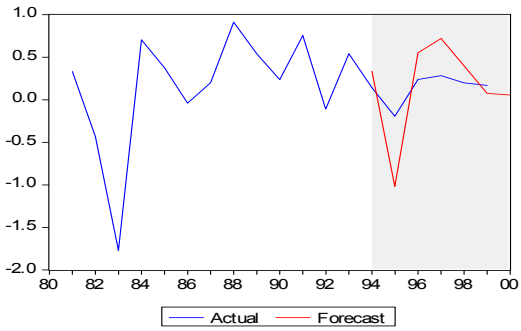


f) Capital goods

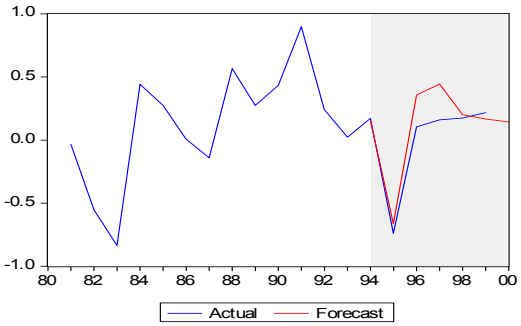
Classification 3



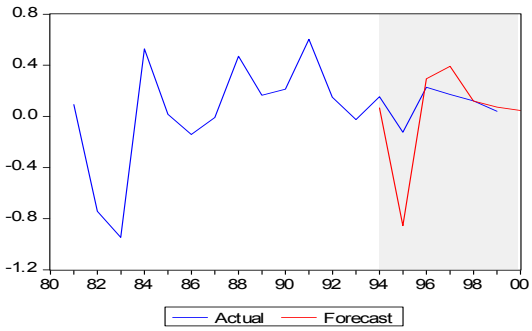
g) Food Products, Beverages and Tobacco



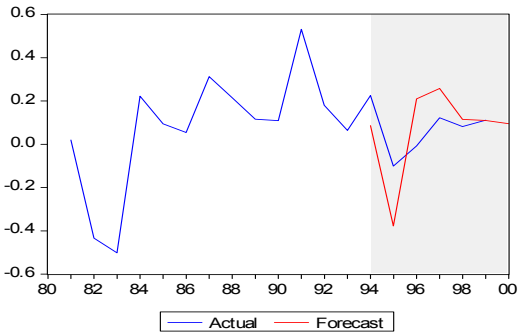
h) Textiles and Leather Products



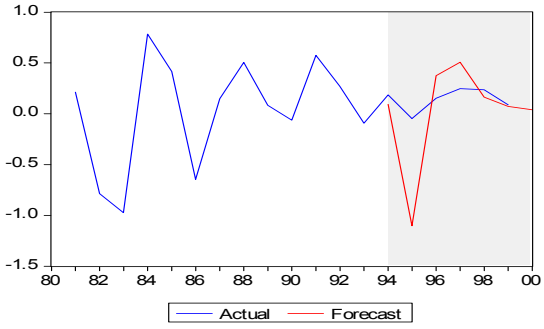
i) Wood Products



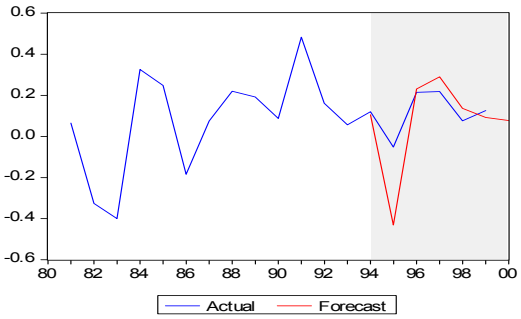
l) Non Metallic Mineral Products



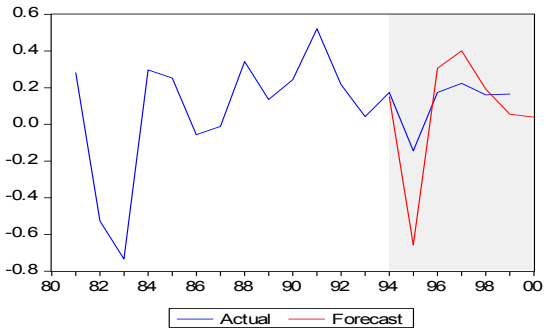
j) Paper Products, Publishing and Printing



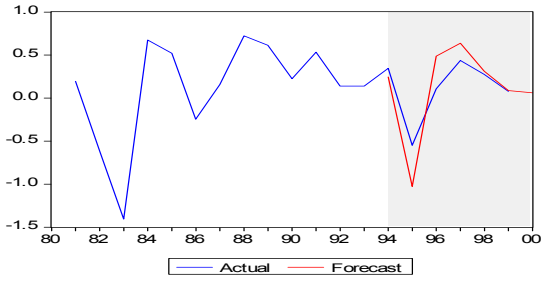
m) Basic Metals



k) Chemicals, Rubber and Plastic Products



n) Machinery and Equipment



o) Other Manufactures

If actual import performance is greater than forecast, then there is *prima facie* evidence of a positive structural break. From the set of fifteen graphs, grouped in Graph 6, we observe that almost all import sectors and manufacturing sub-sectors, except for the Wood Products manufacturing sub-sector, show evidence that NAFTA represented a positive structural beak.

We also calculated the root-mean-square (*rms*) forecast error and the Theil inequality coefficient along with its components for these forecasts. These statistics which are helpful in evaluating the forecasts are as follows:

Forecasts Evaluation					
Graph	Root-mean square error (*rms*)	Theil inequality coefficient	Bias proportion	Variance proportion	Covariance proportion
a) Farming Imports	0.300877	0.604256	0.073364	0.006845	0.919791
b) Extractive Imports	0.245457	0.790667	0.445171	0.027129	0.527700
c) Manufacturing Imports	0.198555	0.4152885	0.090248	0.850437	0.059315
d) Consumer goods	0.119480	0.170755	0.105725	0.372622	0.521653
e) Intermediate goods	0.200585	0.481831	0.096493	0.849572	0.053935
f) Capital goods	0.116684	0.203604	0.376330	0.337757	0.285913
g) Food Products, Beverages and Tobacco	0.139611	0.336156	0.000083	0.077922	0.921995
h) Textiles and Leather Products	0.419418	0.520076	0.008500	0.974283	0.017217
i) Wood Products	0.159861	0.223113	0.349865	0.020220	0.629915
j) Paper Products, Publishing and Printing	0.164707	0.478993	0.001124	0.402019	0.596857
k) Chemicals, Rubber and Plastic Products	0.160355	0.407179	0.084139	0.801863	0.113998
l) Non-Metallic Products	0.315012	0.564214	0.070428	0.866452	0.068630
m) Basic Metals	0.456469	0.651005	0.076202	0.866452	0.057346
n) Machinery and Equipment	0.232887	0.440340	0.048187	0.915811	0.036002
o)Other Manufactures	0.265762	0.295594	0.001033	0.687911	0.311056

From the import forecasts evaluation, we observe that the *rms* forecasts error is relatively high for the Textile and Leather Products, the Non-Metallic Products, and the Basic Metals sub-sectors, but the bias proportion is high for the Extractive sector, the Capital goods and the Wood Products. Therefore, we rely on the forecasts for import categories except for those which have a relatively high bias.

iii) ARDL and Error Correction Modelling

We supplement our previous results with two other econometric techniques, ARDL and ECM. We are looking for the existence of a long run relationship between the variables under consideration, for each type of imports, and for the speed of response of imports to an external shock.

First, the calculated F-statistics, which test for the existence of a long run relationship between the variables included for each import category, are shown in Table 14. All import models were estimated considering *lib85* and *lib94* trade liberalisation indicators and the shift dummy variable for 1991, *d91*.[21] The calculated F-statistic exceeds the upper bound of the critical value band in five import categories (Farming; Intermediate Goods; Wood Products; Chemicals, Rubber and Plastic Products; and, Basic Metals). Then, according to this test, the null hypothesis of no long run relationship between, m^i, *p*, *ym*, *lib85*, *lib94* and *d91* is rejected for those models.[22]

Table 14
Testing for Long Run Relationships using F-statistic

Imports Equation	*Calculated F-statistic*		*Imports Equation*	*Calculated F-statistic*
Farming	9.69*		1. Food Products, Beverages and Tobacco	0.25
Extractive	3.10		2. Textiles and Leather Products	1.77
Manufacturing	3.75		3. Wood Products	4.28**
			4. Paper Products, Publishing and Printing	3.01
			5. Chemicals, Rubber and Plastic Products	6.08*
Consumer Goods	0.97		6. Non-Metallic Mineral Products	3.61
Intermediate Goods	5.03*		7. Basic Metals	4.38**
Capital Goods	2.75		8. Machinery and Equipment	3.50
			9. Other Products	3.15

Notes: As the underlying regression contains an intercept but no trend, the bounds for the F- critical value at the 5 percent and 10 percent level are given by 3.79 and 4.85, and 3.18 and 4.12, respectively. The asterisk (*) denotes rejection of the null hypothesis of no long run relationship at the 5 percent level and the double asterisk (**) shows rejection of the null hypothesis at the10 percent.

[21] For this test, the shift dummy variable for 1991 takes the value of one since 1991.
[22] Where ^{i} denotes the different types of imports.

As it is only appropriate to embark on the second stage of the ARDL procedure if the long run relationship between the variables considered is not spurious, we continue with it for the five import categories that pass this condition: Farming; Intermediate Goods; Wood Products; Chemicals, Rubber and Plastic Products; and, Basic Metals.

The estimation of the long run coefficients and the associated ECM are achieved using ARDL. The order of the ARDL model is determined by using the Schwartz Bayesian Criterion (SBC) or is determined by ourselves. The estimates of the long run coefficients and the ECM associated with these long run estimates are presented in Part A and Part B in Table 15, respectively.

Table 15
Part A: Long Run Coefficients

Variable / m^i	*Constant*	*ym*	*p*	*lib85*	*lib94*	*d91*
Farming ARDL (1,1,0) [2]	-9.57 (-0.95)	1.28 (1.60)	-0.63 (-2.00)*	-0.18 (-1.84)	0.31 (2.36)*	-0.01 (-0.07)
Intermediate Goods ARDL (1,1,0)[1]	-12.18 (-0.66)	1.60 (1.09)	-0.55 (-1.07)	0.39 (1.93)	0.36 (1.65)	0.73 (2.50)*
Wood Products ARDL (1,0,0)[1]	-24.67 (-1.10)	2.43 (1.38)	-2.40 (-3.81)*	0.87 (3.23)*	-0.18 (-0.55)	0.81 (2.64)*
Chemicals, Rubber and PlasticProducts ARDL (1,1,0) [1]	-21.76 (-1.75)	2.23 (2.24)*	-0.24 (-0.66)	0.34 (2.52)*	0.21 (1.39)	0.52 (2.60)*
Basic Metals ARDL (1,0,0) [2]	-20.37 (-0.91)	2.16 (1.23)	-1.84 (-2.83)*	0.37 (1.48)	0.51 (1.64)	0.05 (0.17)

Part B: Error Correction Model

Variable / m^i	*Constant*	*ym*	*p*	*lib85*	*lib94*	*d91*	*ECM*
Farming	-12.72 (-0.91)	3.35 (2.03)*	-0.84 (-1.89)	-0.24 (-1.72)	0.42 (2.36)*	-0.01 (-0.07)	-1.32 (-6.75)*
Intermediate Goods	-7.30 (-0.60)	3.53 (2.87)*	-0.33 (-1.01)	0.23 (2.37)*	0.21 (1.54)	0.43 (3.03)*	-0.59 (-3.85)*
Wood Products	-17.15 (-1.12)	1.69 (1.41)	-1.67 (-3.97)*	0.60 (3.81)*	-0.12 (-0.57)	0.56 (2.17)*	-0.69 (-5.73)*
Chemicals, Rubber and Plastic Products	-14.27 (-1.43)	3.86 (4.05)*	-0.16 (-0.63)	0.22 (2.93)*	0.14 (1.32)	0.34 (3.07)*	-0.65 (-4.41)*
Basic Metals	-18.04 (-0.87)	1.91 (1.16)	-1.63 (-3.17)*	0.33 (1.61)	0.45 (1.64)	0.04 (0.17)	-0.88 (-5.40)*

Notes: [1] Denotes ARDL selected based on SBC. [2] Denotes ARDL was arbitrarily chosen. The asterisk (*) denotes significance of the coefficient at the 5 percent level.

The long run coefficients for the first trade liberalisation indicator, *lib85*, are significant at the 5 percent level for the Wood Products and the Chemicals, Rubber and Plastic Products manufacturing sub-sectors; as expected they show a positive sign. Imports of the former sub-sector increased by 138 percentage points; and, imports of the latter sub-sector rose by 40 percentage points, as a result of trade liberalisation in 1985.

Political debate is now going on concerning the negative effects that NAFTA, so far, has had on the Mexican farming sector. This sector has contracted since the 1980s, but especially since 1994. According to NAFTA's tariff elimination schedule, on 1st January 2003 the remaining import tariffs for most of the agricultural products are going to be eliminated (NAFTA Annex 302.2), but maize[23] is not going to be duty free imported until 2008. Mexican farmers argue that they are not able to compete against very low import prices from the US because US farmers benefit from large subsidies given by their government. The Mexican government, however, does not offer such subsidies to Mexican farmers because it is against NAFTA. Given these facts, a re-negotiation of NAFTA is urged in order to alleviate the trade balance deficit in the farming sector.

Regarding the results for the long run income elasticities, the Chemicals, Rubber and Plastic Products sub-sector is the only one that shows a statistically significant coefficient at the 5 percent level. The price elasticity coefficients, as expected, show a negative sign

[23] Maize is the main grain that Mexican farmers produce and Mexican population consume.

and are statistically significant at the 5 percent level for imports of the Farming sector, the Wood Products and the Basic Metals sub-sectors.

From the ECM models (see part B in Table 15) it is relevant to remark that all the error correction terms are highly significant and have the correct negative sign; suggesting that those import categories converge to equilibrium, once they are shocked.

In sum, through the use of different econometric techniques we show evidence which suggest that the trade reforms launched during the mid-1980s increased the rate of growth of imports. Independently of other factors (i.e. management of exchange rate), imports reacted earlier than exports to those trade reforms (see Pacheco-López, 2002). The results for the analysis of the impact of NAFTA on imports, however, vary by import sectors and manufacturing sub-sectors.

7. Conclusions

This paper has analysed the effects of the two periods of trade reforms, the mid-1980s trade reforms and those related to NAFTA, on Mexico's imports at the aggregate and at a disaggregated level. The application of different econometric techniques (i.e. OLS method, outside forecast, ECM, ARDL, etc.), suggest that there was a positive impact of the mid-1980s trade reforms on imports. Regarding, the effects of NAFTA on imports, we found evidence of a very short structural break for most main sectors and

manufacturing sub-sectors. These findings lead us to draw some further conclusions on Mexico's import performance.

In particular, at the disaggregated level we observe that the performance of imports during the last two decades has been very unstable, showing volatile growth rates. In spite of this peculiar performance, there is no much evidence of change in the composition of the manufacturing sub-sectors as a consequence of trade reforms. Even more, trade reforms have accentuated the demand of imports from those manufacturing sub-sectors that already had a major share in total imports.

Additionally, this study provides more empirical evidence about the idea that imports react faster than exports to trade liberalisation, specifically referring to mid-1980s trade reforms.

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A P P E N D I X

Table A1
OLS Estimation for Import Growth: 1970-2000

Dependent variable: Import growth (*m*)								
Regressor	*lib94*			*lib95*			*lib96*	
	A1.1	A1.2		A1.3	A1.4		A1.5	A1.6
Constant	-0.07 (-1.54)	-0.07 (-1.32)		0.00 (0.16)	-0.08 (-1.51)		0.00 (0.01)	-0.09 (-1.73)
ym	2.25 (2.58)*	2.16 (2.22)*		1.10 (1.38)	2.28 (2.50)		1.17 (1.44)	2.48 (2.75)*
p	-0.68 (-3.59)*	-0.70 (-3.39)*		-0.89 (-4.88)*	-0.67 (-3.41)*		-0.87 (-4.61)*	-0.65 (-3.40)*
m_{-1}	0.11 (1.05)	0.12 (1.06)		0.22 (1.94)	0.11 (1.02)		0.21 (1.83)	0.11 (1.00)
md	-0.06 (-0.84)	-0.05 (-0.70)		-0.04 (-0.50)	-0.06 (-0.83)		-0.04 (-0.54)	-0.07 (-1.04)
lib86	0.11 (2.43)*	0.10 (1.72)			0.11 (2.16)*			0.15 (2.47)*
lib94, lib95, lib96		0.01 (0.25)		0.04 (0.90)	-0.00 (-0.16)		0.03 (0.79)	-0.05 (-0.99)
R^2	0.81	0.81		0.77	0.81		0.76	0.82
Durbin Watson	1.55	1.54		1.57	1.55		1.55	1.58
Diagnostic Tests								
Serial Correlation	0.266	0.274		0.266	0.275		0.241	0.309
Functional Form	0.305	0.259		0.294	0.343		0.427	0.418
Normality	0.566	0.560		0.690	0.584		0.583	0.578
Heteroscedasticity	0.207	0.179		0.356	0.207		0.192	0.307

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. The diagnostic tests show probabilities.

Table A2
OLS Estimation for Import Growth: 1970-2000

Dependent variable: Import growth (*m*)					
Regressor	*lib94*			*lib95*	*lib96*
	A2.1	A2.2		A2.3	A2.4
Constant	-0.03 (-0.66)	-0.01 (-0.36)		-0.03 (-0.60)	-0.03 (-0.69)
ym	1.62 (1.85)	1.34 (1.43)		1.58 (1.74)	1.67 (1.83)
p	-0.76 (-3.66)*	-0.83 (-3.70)*		-0.77 (-3.55)*	-0.74 (-3.45)*
m_{-1}	0.17 (1.43)	0.18 (1.54)		0.17 (1.41)	0.17 (1.39)
md	-0.04 (-0.58)	-0.03 (-0.36)		-0.04 (-0.52)	-0.04 (-0.60)
lib87	0.06 (1.42)	0.03 (0.55)		0.06 (1.07)	0.08 (1.16)
lib94, lib95, lib96		0.05 (0.85)		0.01 (0.24)	-0.01 (-0.27)
R2	0.78	0.79		0.78	0.78
Durbin Watson	1.60	1.56		1.60	1.61
Diagnostic Tests					
Serial Correlation	0.313	0.299		0.324	0.334
Functional Form	0.722	0.369		0.609	0.804
Normality	0.866	0.779		0.856	0.891
Heteroscedasticity	0.056	0.066		0.066	0.061

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. The diagnostic tests show probabilities.

Table A3
Diagnostic Tests

Dependent variable : m^i					
Test / m^i	*Eq.*	*Serial correlation*	*Functional Form*	*Normality*	*Heteroscedasticity*
Farming	*A3.1*	*0.117*	*0.280*	*0.561*	*0.473*
	A3.2	*0.139*	*0.454*	*0.670*	*0.427*
	A3.3	*0.168*	*0.454*	*0.728*	*0.610*
	A3.4	*0.345*	*0.679*	*0.706*	*0.509*
	A3.5	*0.357*	*0.763*	*0.761*	*0.541*
Extractive	*A3.6*	*0.469*	*0.089*	*0.950*	*0.723*
	A3.7	*0.613*	*0.827*	*0.884*	*0.409*
	A3.8	*0.901*	*0.031*	*0.767*	*0.595*
	A3.9	*0.732*	*0.073*	*0.999*	*0.185*
	A3.10	*0.964*	*0.023*	*0.885*	*0.315*
Manufacturing	*A3.11*	*0.551*	*0.144*	*0.005*	*0.842*
	A3.12	*0.888*	*0.619*	*0.372*	*0.781*
	A3.13	*0.271*	*0.125*	*0.448*	*0.723*
	A3.14	*0.969*	*0.217*	*0.355*	*0.898*
	A3.15	*0.187*	*0.159*	*0.547*	*0.798*

Note: The diagnostic tests show probabilities.

Table A4
OLS Estimation for Disaggregated Imports Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Farming							*lib94*			
	A4.1	0.02 (0.26)	-1.66 (-0.96)	-1.75 (-4.94)*	-0.46 (-3.48)*	0.07 (0.75)		-0.16 (-0.89)		*0.78*
	A4.2	0.04 (0.49)	-2.64 (-1.47)	-1.92 (-5.34)*	-0.45 (-3.51)*	0.01 (0.09)	0.14 (1.45)	-0.09 (-0.51)		*0.82*
							lib95			
	A4.3	0.06 (1.09)	-1.94 (-1.09)	-1.83 (-5.17)*	-0.46 (-3.51)*		0.08 (0.91)	-0.12 (-0.66)		*0.79*
	A4.4	0.03 (0.31)	-1.95 (-1.07)	-1.80 (-4.86)*	-0.47 (-3.41)*	0.05 (0.45)	0.06 (0.66)	-0.13 (-0.70)		*0.79*
							lib96			
	A4.5	0.08 (1.38)	-1.58 (-0.78)	-1.78 (-4.90)*	-0.46 (-3.31)*		0.00 (0.06)	-0.15 (-0.77)		*0.77*
	A4.6	0.06 (0.52)	-1.60 (-0.76)	-1.77 (-4.64)*	-0.46 (-3.19)*	0.02 (0.21)	0.00 (0.03)	-0.15 (-0.76)		*0.78*
Extractive							*lib94*			
	A4.7	-0.07 (-0.67)	1.40 (0.74)	-0.11 (-0.27)	0.06 (0.24)		0.12 (0.96)	-0.20 (-1.00)		*0.28*
	A4.8[1]	-0.06 (-0.56)	0.74 (0.36)	-0.23 (-0.54)	0.05 (0.18)	0.07 (0.57)	0.10 (0.88)	-0.15 (-0.73)		*0.32*
							lib95			
	A4.10[1]	-0.00 (-0.07)	1.12 (0.57)	-0.22 (-0.55)	0.09 (0.35)		0.09 (0.87)	-0.15 (-0.72)		*0.27*
	A4.11	-0.07 (-0.64)	1.09 (0.49)	-0.16 (-0.38)	0.02 (0.12)	0.10 (0.75)	0.07 (0.83)	-0.18 (-0.83)		*0.26*
							lib96			
	A4.12	0.01 (0.23)	1.74 (0.80)	-0.16 (-0.39)	0.18 (0.71)		-0.02 (-0.19)	-0.19 (-0.88)		*0.23*
	A4.13	-0.07 (-0.65)	1.72 (0.78)	-0.09 (-0.22)	0.08 (0.30)	0.13 (0.96)	-0.04 (-0.31)	-0.22 (-1.01)		*0.28*
Manufacturing							*lib94*			
	A4.14	-0.05 (-0.52)	1.75 (1.00)	-0.85 (-2.19)*	0.16 (0.86)	0.10 (0.85)		0.26 (1.46)		*0.73*
	A4.15	-0.05 (-0.42)	1.62 (0.78)	-0.87 (-1.92)	0.17 (0.81)	0.09 (0.61)	0.01 (0.13)	0.27 (1.39)		*0.73*
							lib95			
	A4.16	0.01 (0.27)	1.49 (0.80)	-0.97 (-2.55)*	0.24 (1.52)		0.02 (0.26)	0.27 (1.47)		*0.71*
	A4.17	-0.05 (-0.50)	1.81 (0.94)	-0.83 (-1.97)	0.15 (0.77)	0.10 (0.78)	-0.01 (-0.09)	0.25 (1.35)		*0.73*
							lib96			
	A4.18	0.02 (0.47)	2.15 (1.07)	-0.92 (-2.45)*	0.23 (1.48)		-0.06 (-0.55)	0.24 (1.30)		*0.72*
	A4.19	-0.07 (-0.68)	2.70 (1.32)	-0.75 (-1.87)	0.11 (0.59)	0.14 (1.10)	-0.10 (-0.89)	0.22 (1.19)		*0.74*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5% level. [1] The estimation fails Functional Form test.

Table A5
OLS Estimation for Disaggregated Imports Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib87*	*lib94, lib95, lib96*	*d91*		R^2
Farming							*lib94*			
	A5.1	-0.03 (-0.38)	-2.18 (-1.35)	-1.68 (-5.17)*	-0.47 (-3.89)*	0.17 (1.83)		-0.18 (-1.07)		*0.82*
	A5.2	-0.01 (-0.95)	-2.70 (-1.58)	-1.81 (-5.14)*	-0.46 (-3.79)*	0.12 (1.12)	0.09 (0.95)	-0.13 (-0.75)		*0.83*
							lib95			
	A5.3	-0.02 (-0.33)	-2.25 (-1.32)	-1.70 (-4.88)*	-0.47 (-3.75)*	0.16 (1.50)	0.02 (0.23)	-0.17 (-0.95)		*0.82*
							lib96			
	A5.4	-0.03 (-0.38)	-1.91 (-1.01)	-1.66 (-4.86)*	-0.48 (-3.75)*	0.18 (1.79)	-0.03 (-0.31)	-0.19 (-1.08)		*0.82*
Extractive							*lib94*			
	A5.5	-0.07 (-0.70)	1.10 (0.58)	-0.08 (-0.20)	0.06 (0.27)	0.13 (1.07)		-0.21 (-1.02)		*0.29*
	A5.6[1]	-0.06 (-0.56)	0.62 (0.30)	-0.20 (-0.47)	0.05 (0.22)	0.08 (0.59)	0.09 (0.78)	-0.16 (-0.75)		*0.32*
							lib95			
	A5.7[1]	-0.06 (-0.65)	0.90 (0.45)	-0.13 (-0.31)	0.03 (0.12)	0.11 (0.80)	0.06 (0.54)	-0.18 (-0.85)		*0.30*
							lib96			
	A5.8[1]	-0.07 (-0.67)	1.40 (0.63)	-0.06 (-0.16)	0.09 (0.32)	0.14 (1.06)	-0.04 (-0.30)	-0.22 (-1.02)		*0.29*
Manufacturing							*lib94*			
	A5.9	0.00 (0.01)	1.58 (0.88)	-0.92 (-2.31)*	0.22 (1.24)	0.03 (0.26)		0.26 (1.43)		*0.71*
	A5.10	0.01 (0.16)	1.17 (0.57)	-1.03 (-2.19)*	0.26 (1.30)	-0.01 (-0.08)	0.05 (0.49)	0.29 (1.47)		*0.72*
							lib95			
	A5.11	0.00 (0.04)	1.50 (0.78)	-0.94 (-2.15)*	0.23 (1.20)	0.02 (0.14)	0.01 (0.15)	0.27 (1.38)		*0.71*
							lib96			
	A5.12	-0.00 (-0.05)	2.20 (1.06)	-0.86 (-2.05)*	0.20 (1.06)	0.05 (0.41)	-0.07 (-0.62)	0.23 (1.21)		*0.72*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. [1] The estimation fails Functional Form test.

Table A6
Diagnostic Tests

Dependent variable : m^i					
Test / m^i	*Eq.*	*Serial correlation*	*Functional Form*	*Normality*	*Heteroscedasticity*
Consumer Goods	*A6.1*	*0.732*	*0.250*	*0.588*	*0.946*
	A6.2	*0.380*	*0.659*	*0.780*	*0.936*
	A6.3	*0.293*	*0.681*	*0.941*	*0.841*
	A6.4	*0.393*	*0.560*	*0.740*	*0.914*
	A6.5	*0.176*	*0.584*	*0.953*	*0.875*
Intermediate Goods	*A6.6*	*0.376*	*0.394*	*0.142*	*0.910*
	A6.7	*0.499*	*0.467*	*0.953*	*0.774*
	A6.8	*0.562*	*0.329*	*0.142*	*0.436*
	A6.9	*0.797*	*0.120*	*0.931*	*0.435*
	A6.10	*0.584*	*0.234*	*0.190*	*0.405*
Capital Goods	*A6.11*	*0.949*	*0.289*	*0.682*	*0.347*
	A6.12	*0.588*	*0.917*	*0.934*	*0.296*
	A6.13	*0.075*	*0.355*	*0.896*	*0.796*
	A6.14	*0.599*	*0.614*	*0.986*	*0.313*
	A6.15	*0.016*	*0.389*	*0.737*	*0.647*

Note: The diagnostic tests show probabilities.

Table A7
OLS Estimation for Disaggregated Imports Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Consumer Goods							*lib94*			
	A7.1	-0.02 (-0.15)	2.65 (1.09)	-1.65 (-3.11)*	0.26 (1.62)	0.05 (0.35)		-0.26 (-1.03)		*0.77*
	A7.2	-0.06 (-0.39)	3.67 (1.30)	-1.43 (-2.33)*	0.20 (1.12)	0.14 (0.70)	-0.11 (-0.73)	-0.30 (-1.14)		*0.78*
							lib95			
	A7.3	0.03 (0.46)	3.06 (1.23)	-1.64 (-3.20)*	0.28 (2.02)*		-0.07 (-0.62)	-0.29 (-1.13)		*0.77*
	A7.4	-0.05 (-0.35)	3.42 (1.32)	-1.48 (-2.62)*	0.22 (1.26)	0.13 (0.71)	-0.12 (-0.87)	-0.30 (-1.16)		*0.78*
							lib96			
	A7.5	0.03 (0.45)	3.99 (1.48)	-1.61 (-3.23)*	0.27 (1.93)		-0.15 (-1.03)	-0.31 (-1.25)		*0.78*
	A7.6	-0.06 (-0.44)	4.51 (1.61)	-1.46 (-2.69)*	0.19 (1.15)	0.13 (0.80)	-0.20 (-1.24)	-0.33 (-1.29)		*0.80*
Intermediate Goods							*lib94*			
	A7.7	-0.01 (-0.17)	0.39 (0.29)	-0.86 (-3.01)*	0.09 (0.62)	0.09 (1.09)		0.41 (2.92)*		*0.78*
	A7.8	0.00 (0.08)	-0.26 (-0.17)	-0.99 (-3.13)*	0.14 (0.90)	0.04 (0.45)	0.07 (0.96)	0.45 (3.07)*		*0.79*
							lib95			
	A7.9	0.04 (0.95)	-0.01 (-0.00)	-0.98 (-3.43)*	0.17 (1.26)		0.06 (0.88)	0.44 (3.11)*		*0.77*
	A7.10	-0.00 (-0.08)	0.17 (0.12)	-0.90 (-2.94)*	0.11 (0.69)	0.07 (0.77)	0.03 (0.48)	0.42 (2.87)*		*0.78*
							lib96			
	A7.11	0.05 (1.26)	0.42 (0.26)	-0.93 (-3.18)*	0.17 (1.20)		-0.01 (-0.12)	0.42 (2.80)*		*0.76*
	A7.12	-0.02 (-0.25)	0.82 (0.50)	-0.82 (-2.72)*	0.07 (0.44)	0.11 (1.17)	-0.04 (-0.51)	0.38 (2.59)*		*0.78*
Capital Goods							*lib94*			
	A7.13	-0.13 (-1.40)	3.27 (1.72)	-0.85 (-1.92)	0.12 (0.68)	0.13 (1.04)		-0.02 (-0.11)		*0.75*
	A7.14	-0.15 (-1.18)	3.77 (1.67)	-0.74 (-1.40)	0.09 (0.43)	0.17 (1.08)	-0.05 (-0.43)	-0.03 (-0.18)		*0.76*
							lib95			
	A7.15	-0.02 (-0.39)	3.08 (1.52)	-1.02 (-2.37)*	0.23 (1.43)		-0.01 (-0.12)	-0.04 (-0.20)		*0.73*
	A7.16	-0.15 (-1.20)	3.67 (1.78)	-0.77 (-1.60)	0.10 (0.52)	0.16 (1.17)	-0.06 (-0.60)	-0.04 (-0.21)		*0.76*
							lib96			
	A7.17	-0.02 (-0.38)	3.46 (1.59)	-1.01 (-2.35)*	0.23 (1.42)		-0.05 (-0.45)	-0.05 (-0.28)		*0.74*
	A7.18	-0.15 (-1.25)	4.15 (1.88)	-0.76 (-1.65)	0.09 (0.51)	0.16 (1.22)	0.09 (-0.80)	-0.05 (-0.27)		*0.77*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level.

Table A8
OLS Estimation for Disaggregated Imports Growth: 1980-2000

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib87*	*lib94, lib95, lib96*	*d91*		R^2
Consumer Goods							*lib94*			
	A8.1	0.05 (0.38)	2.68 (1.10)	-1.74 (-3.27)*	0.31 (1.98)	-0.04 (-0.26)		-0.26 (-1.02)		*0.77*
	A82	0.03 (0.24)	3.04 (1.09)	-1.64 (-2.56)*	0.29 (1.61)	-0.00 (-0.02)	-0.05 (-0.30)	-0.28 (-1.03)		*0.77*
							lib95			
	A8.3	0.03 (0.23)	3.07 (1.18)	-1.63 (-2.78)*	0.28 (1.68)	0.00 (0.04)	-0.08 (-0.54)	-0.29 (-1.08)		*0.77*
							lib96			
	A8.4	0.03 (0.23)	3.99 (1.43)	-1.60 (-2.90)*	0.27 (1.64)	0.00 (0.02)	-0.15 (-0.96)	-0.31 (-1.20)		*0.78*
Intermediate Goods							*lib94*			
	A8.5	0.00 (0.04)	0.17 (0.12)	-0.86 (-2.97)*	0.12 (0.79)	0.08 (0.97)		0.41 (2.91)*		*0.77*
	A8.6	0.02 (0.30)	-0.40 (-0.27)	-1.01 (-3.10)*	0.17 (1.07)	0.02 (0.25)	0.08 (0.99)	0.45 (3.08)*		*0.79*
							lib95			
	A8.7	0.00 (0.12)	0.00 (0.00)	-0.91 (-2.89)*	0.13 (0.85)	0.06 (0.62)	0.04 (0.48)	0.43 (2.86)*		*0.78*
							lib96			
	A8.8	0.00 (0.00)	0.47 (0.29)	-0.83 (-2.70)*	0.10 (0.66)	0.09 (1.01)	-0.03 (-0.39)	0.39 (2.61)*		*0.78*
Capital Goods							*lib94*			
	A8.9	-0.01 (-0.11)	3.03 (1.55)	-1.06 (-2.30)*	0.24 (1.35)	-0.02 (-0.18)		-0.04 (-0.19)		*0.73*
	A8.10	0.00 (0.02)	2.68 (1.19)	-1.17 (-2.08)*	0.27 (1.34)	-0.05 (-0.35)	0.04 (0.35)	-0.02 (-0.12)		*0.74*
							lib95			
	A8.11	-0.01 (-0.11)	3.06 (1.45)	-1.05 (-2.07)*	0.24 (1.26)	-0.02 (-0.13)	-0.00 (-0.04)	-0.04 (-0.19)		*0.74*
							lib96			
	A8.12	-0.01 (-0.15)	3.44 (1.52)	-1.02 (-2.09)*	0.23 (1.23)	-0.01 (-0.07)	-0.05 (-0.40)	-0.05 (-0.27)		*0.74*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level.

Table A9
Diagnostic Tests

Dependent variable : m^i					
Test / m^i	*Eq.*	*Serial correlation*	*Functional Form*	*Normality*	*Heteroscedasticity*
Food Products, Beverages and Tobacco	*A9.1*	*0.774*	*0.871*	*0.338*	*0.608*
	A9.2	*0.064*	*0.782*	*0.534*	*0.514*
	A9.3	*0.034*	*0.722*	*0.747*	*0.448*
	A9.4	*0.074*	*0.782*	*0.543*	*0.494*
	A9.5	*0.006*	*0.799*	*0.768*	*0.353*
Textiles and Leather Products	*A9.6*	*0.747*	*0.635*	*0.001*	*0.682*
	A9.7	*0.560*	*0.670*	*0.001*	*0.688*
	A9.8	*0.455*	*0.018*	*0.961*	*0.184*
	A9.9	*0.617*	*0.316*	*0.000*	*0.849*
	A9.10	*0.223*	*0.010*	*0.920*	*0.168*
Wood Products	*A9.11*	*0.955*	*0.813*	*0.830*	*0.659*
	A9.12	*0.379*	*0.707*	*0.987*	*0.566*
	A9.13	*0.385*	*0.523*	*0.895*	*0.489*
	A9.14	*0.290*	*0.806*	*0.935*	*0.556*
	A9.15	*0.378*	*0.815*	*0.895*	*0.372*
Paper Products, Publishing and Printing	*A9.16*	*0.272*	*0.766*	*0.266*	*0.419*
	A9.17	*0.684*	*0.040*	*0.975*	*0.272*
	A9.18	*0.588*	*0.032*	*0.798*	*0.384*
	A9.19	*0.694*	*0.042*	*0.968*	*0.271*
	A9.20	*0.651*	*0.023*	*0.890*	*0.284*
Chemicals, Rubber and Plastic Products	*A9.21*	*0.869*	*0.072*	*0.465*	*0.659*
	A9.22	*0.936*	*0.239*	*0.726*	*0.607*
	A9.23	*0.636*	*0.924*	*0.631*	*0.292*
	A9.24	*0.947*	*0.920*	*0.864*	*0.357*
	A9.25	*0.649*	*0.903*	*0.637*	*0.288*
Non-Metallic Mineral Products	*A9.26*	*0.873*	*0.061*	*0.043*	*0.682*
	A9.27	*0.572*	*0.269*	*0.212*	*0.758*
	A9.28	*0.097*	*0.600*	*0.540*	*0.793*
	A9.29	*0.469*	*0.966*	*0.188*	*0.872*
	A9.30	*0.102*	*0.730*	*0.583*	*0.928*
Basic Metals	*A9.31*	*0.670*	*0.135*	*0.893*	*0.314*
	A9.32	*0.529*	*0.197*	*0.890*	*0.329*
	A9.33	*0.316*	*0.884*	*0.732*	*0.933*
	A9.34	*0.385*	*0.925*	*0.957*	*0.814*
	A9.35	*0.311*	*0.808*	*0.797*	*0.671*
Machinery and Equipment	*A9.36*	*0.635*	*0.133*	*0.007*	*0.954*
	A9.37	*0.928*	*0.891*	*0.297*	*0.958*
	A9.38	*0.204*	*0.082*	*0.625*	*0.675*
	A9.39	*0.988*	*0.244*	*0.310*	*0.743*
	A9.40	*0.134*	*0.112*	*0.736*	*0.763*
Other Manufactures	*A9.41*	*0.755*	*0.775*	*0.100*	*0.949*
	A9.42	*0.848*	*0.656*	*0.355*	*0.900*
	A9.43	*0.672*	*0.063*	*0.942*	*0.867*
	A9.44	*0.846*	*0.850*	*0.279*	*0.605*
	A9.45	*0.349*	*0.180*	*0.975*	*0.340*

Note: The diagnostic tests show probabilities.

Table A10
OLS Estimation for Disaggregated Imports Growth: 1980-1999

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Food Products, Beverages and Tobacco							*lib94*			
	A10.1	-0.02 (-0.14)	-1.15 (-0.51)	-1.43 (-3.14)*	0.17 (0.88)	0.16 (1.09)		-0.29 (-1.27)		*0.67*
	A10.2	-0.07 (-0.50)	0.00 (0.00)	-1.20 (-2.42)*	0.07 (0.32)	0.27 (1.51)	-0.15 (-1.07)	-0.35 (-1.49)		*0.70*
							lib95			
	A10.3	0.12 (1.54)	-0.91 (-0.38)	-1.49 (-3.20)*	0.26 (1.50)		-0.07 (-0.64)	-0.31 (-1.30)		*0.65*
	A10.4	-0.06 (-0.45)	-0.34 (-0.15)	-1.27 (-2.78)*	0.08 (0.42)	0.26 (1.63)	-0.17 (-1.35)	-0.34 (-1.53)		*0.72*
							lib96			
	A10.5	0.11 (1.44)	-0.76 (-0.29)	-1.51 (-3.22)*	0.26 (1.40)		-0.06 (-0.39)	-0.30 (-1.25)		*0.64*
	A10.6	-0.05 (-0.40)	0.12 (0.04)	-1.32 (-2.82)*	0.08 (0.38)	0.22 (1.39)	-0.15 (-0.95)	-0.34 (-1.44)		*0.69*
Textiles and Leather Products							*lib94*			
	A10.7[1]	-0.30 (-0.96)	6.69 (1.23)	-0.39 (-0.34)	-0.12 (-0.50)	0.41 (1.16)		0.36 (0.66)		*0.45*
	A10.8	-0.38 (-1.18)	8.99 (1.53)	0.11 (0.09)	-0.21 (-0.78)	0.61 (1.51)	-0.32 (-1.00)	0.21 (0.37)		*0.49*
							lib95			
	A10.9[2]	0.01 (0.08)	6.57 (1.12)	-0.74 (-0.63)	0.01 (0.04)		-0.04 (-0.16)	0.39 (0.68)		*0.39*
	A10.10	-0.35 (-1.08)	7.87 (1.38)	-0.10 (-0.08)	-0.19 (-0.71)	0.55 (1.37)	-0.25 (-0.78)	0.26 (0.46)		*0.48*
							lib96			
	A10.11	0.03 (0.18)	8.45 (1.38)	-0.66 (-0.57)	-0.00 (-0.04)		-0.28 (-0.80)	0.31 (0.54)		*0.42*
	A10.12[1]	-0.37 (-1.20)	10.24 (1.74)	-0.06 (-0.05)	-0.22 (-0.85)	0.56 (1.57)	-0.46 (-1.32)	0.17 (0.32)		*0.32*
Wood Products							*lib94*			
	A10.13	-0.03 (-0.20)	4.10 (1.59)	-1.13 (-2.10)*	0.15 (0.94)	0.01 (0.07)		0.57 (2.12)*		*0.76*
	A10.14	-0.08 (-0.53)	5.37 (1.91)	0.84 (-1.42)	0.06 (0.32)	0.13 (0.67)	-0.18 (-1.07)	0.52 (1.89)		*0.78*
							lib95			
	A10.15	0.00 (0.08)	4.70 (1.84)	-1.05 (-2.05)*	0.13 (0.93)		-0.13 (-0.99)	0.54 (2.06)*		*0.78*
	A10.16	-0.06 (-0.45)	4.87 (1.85)	-0.94 (-1.70)	0.07 (0.44)	0.11 (0.62)	-0.18 (-1.14)	0.53 (1.95)		*0.78*
							lib96			
	A10.17	-0.00 (-0.04)	5.44 (1.97)	-1.06 (-2.09)*	0.11 (0.80)		-0.17 (-1.06)	0.53 (2.01)*		*0.78*
	A10.18	-0.07 (-0.46)	5.70 (1.97)	-0.98 (-1.80)	0.06 (0.39)	0.09 (0.52)	-0.21 (-1.15)	0.52 (1.90)		*0.78*

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(continued)

Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Paper Products, Publishing and Printing							*lib94*			
	A10.19[1]	-0.08 (-0.86)	1.15 (0.71)	-0.49 (-1.46)	0.14 (0.70)	0.14 (1.23)		0.36 (2.11)		*0.67*
	A10.20[1]	-0.10 (-0.96)	1.51 (0.84)	-0.41 (-1.10)	0.09 (0.40)	0.19 (1.30)	-0.06 (-0.55)	0.33 (1.81)		*0.68*
							lib95			
	A10.21[1]	0.02 (0.37)	1.36 (0.78)	-0.55 (-1.56)	0.28 (1.61)		-0.02 (-0.31)	0.37 (2.03)*		*0.63*
	A10.22[1]	-0.10 (-1.05)	1.49 (0.90)	-0.40 (-1.18)	0.07 (0.34)	0.20 (1.56)	-0.10 (-1.01)	0.32 (1.83)		*0.70*
							lib96			
	A10.23[1]	0.02 (0.46)	1.89 (1.02)	-0.53 (-1.56)	0.25 (1.48)		-0.09 (-0.81)	0.34 (1.93)		*0.65*
	A10.24[1]	-0.11 (1.25)	2.34 (1.37)	-0.39 (-1.22)	0.01 (0.06)	0.22 (1.83)	-0.17 (-1.56)	0.29 (1.73)		*0.73*
Chemicals, Rubber and Plastic Products							*lib94*			
	A10.25	0.02 (0.28)	1.79 (1.28)	-0.58 (-2.02)*	0.09 (0.55)	0.01 (0.17)		0.30 (2.18)*		*0.73*
	A10.26	0.03 (0.42)	1.40 (0.90)	-0.66 (-2.07)*	0.13 (0.70)	-0.01 (-0.16)	0.05 (0.65)	0.33 (2.22)*		*0.74*
							lib95			
	A10.27	0.02 (0.54)	1.62 (1.16)	-0.61 (-2.21)*	0.11 (0.71)		0.04 (0.58)	0.32 (2.30)*		*0.73*
	A10.28	0.02 (0.34)	1.62 (1.10)	-0.62 (-2.03)*	0.11 (0.62)	-0.00 (-0.04)	0.04 (0.53)	0.32 (2.18)*		*0.73*
							lib96			
	A10.29	0.03 (0.84)	2.05 (1.35)	-0.58 (-2.08)*	0.10 (0.69)	-0.03 (-0.44)		0.29 (2.07)*		*0.73*
	A10.30	0.01 (0.21)	2.13 (1.33)	-0.55 (-1.84)	0.08 (0.43)	0.02 (0.30)	-0.04 (-0.49)	0.28 (1.91)		*0.73*
Non-Metallic Mineral Products							*lib94*			
	A10.31	-0.21 (-1.26)	2.48 (0.85)	-0.89 (-1.50)	-0.03 (-0.18)	0.26 (1.43)		0.37 (1.33)		*0.64*
	A10.32	-0.21 (-1.18)	2.54 (0.76)	-0.88 (-1.30)	-0.04 (-0.18)	0.26 (1.21)	-0.00 (-0.04)	0.37 (1.22)		*0.64*
							lib95			
	A10.32	-0.02 (-0.22)	1.89 (0.59)	-1.15 (-1.85)	0.09 (0.48)		0.06 (0.40)	0.42 (1.35)		*0.59*
	A10.33	-0.21 (-1.21)	2.55 (0.82)	-0.87 (-1.37)	-0.04 (-0.19)	0.27 (1.31)	-0.01 (-0.11)	0.37 (1.22)		*0.64*
							lib96			
	A10.34	-0.00 (-0.00)	2.73 (0.80)	-1.09 (-1.76)	0.09 (0.47)		-0.08 (-0.45)	0.37 (1.18)		*0.59*
	A10.35	-0.24 (-1.39)	3.84 (1.18)	-0.78 (-1.28)	-0.08 (-0.38)	0.31 (1.64)	-0.17 (-0.95)	0.31 (1.06)		*0.67*

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(Continued)

Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Basic Metals							*lib94*			
	A10.36	-0.01 (-0.04)	3.07 (0.81)	-1.29 (-1.65)	0.04 (0.22)	0.00 (0.00)		0.34 (0.88)		*0.54*
	A10.37	0.02 (0.10)	1.97 (0.48)	-1.53 (-1.79)	0.08 (0.36)	-0.09 (-0.34)	0.17 (0.76)	0.42 (1.04)		*0.57*
							lib95			
	A10.38	-0.03 (-0.25)	2.71 (0.71)	-1.34 (-1.76)	0.04 (0.20)		0.10 (0.54)	0.37 (0.97)		*0.55*
	A10.39	0.00 (0.00)	2.66 (0.67)	-1.38 (-1.68)	0.05 (0.25)	-0.05 (-0.19)	0.12 (0.55)	0.39 (0.95)		*0.55*
							lib96			
	A10.40	0.00 (0.01)	3.84 (0.94)	-1.26 (-1.66)	0.04 (0.24)		-0.11 (-0.48)	0.30 (0.77)		*0.55*
	A10.41	-0.01 (-0.08)	3.88 (0.91)	-1.24 (-1.52)	0.04 (0.18)	0.02 (0.11)	-0.12 (-0.47)	0.29 (0.71)		*0.55*
Machinery and Equipment							*lib94*			
	A10.42	-0.08 (-0.68)	2.35 (1.11)	-0.75 (-1.60)	0.14 (0.68)	0.12 (0.91)		0.27 (1.33)		*0.69*
	A10.43	-0.07 (-0.56)	2.14 (0.86)	-0.80 (-1.46)	0.16 (0.68)	0.11 (0.63)	0.02 (0.19)	0.28 (1.28)		*0.69*
							lib95			
	A10.44	0.00 (0.03)	1.94 (0.88)	-0.92 (-2.05)*	0.24 (1.36)		0.04 (0.40)	0.29 (1.35)		*0.68*
	A10.45	-0.08 (-0.64)	2.33 (1.01)	-0.75 (-1.48)	0.14 (0.64)	0.12 (0.78)	0.00 (0.03)	0.27 (1.26)		*0.69*
							lib96			
	A10.46	0.01 (0.25)	2.46 (1.04)	-0.88 (-1.97)	0.24 (1.34)		-0.05 (-0.38)	0.26 (1.19)		*0.68*
	A10.47	-0.10 (-0.78)	3.10 (1.28)	-0.67 (-1.38)	0.10 (0.50)	0.16 (1.07)	-0.09 (-0.69)	0.24 (1.11)		*0.71*
Other Manufactures							*lib94*			
	A10.48	-0.07 (-0.30)	6.92 (1.72)	-1.10 (-1.26)	0.15 (0.74)	0.04 (0.16)		0.13 (0.32)		*0.62*
	A10.49	-0.11 (-0.45)	7.98 (1.77)	-0.85 (-0.86)	0.10 (0.46)	0.14 (0.45)	-0.15 (-0.60)	0.06 (0.15)		*0.63*
							lib95			
	A10.50	-0.01 (-0.09)	7.41 (1.83)	-1.07 (-1.28)	0.17 (0.93)		-0.12 (-0.60)	0.10 (0.24)		*0.63*
	A10.51	-0.10 (-0.43)	7.64 (1.81)	-0.91 (-0.99)	0.11 (0.50)	0.14 (0.46)	-0.17 (-0.72)	0.07 (0.16)		*0.64*
							lib96			
	A10.52	-0.00 (-0.07)	9.16 (2.20)*	-1.02 (-1.29)	0.15 (0.86)		-0.31 (-1.29)	0.03 (0.08)		*0.67*
	A10.53	-0.12 (-0.55)	9.58 (2.21)*	-0.85 (-0.99)	0.08 (0.38)	0.16 (0.61)	-0.36 (-1.38)	-0.00 (-0.00)		*0.68*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. [1] The estimation fails Functional Form test. [2] The estimation fails normality test.

Table A11
OLS Estimation for Disaggregated Imports Growth: 1980-1999

Dependent variable : m^i										
Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib87*	*lib94, lib95, lib96*	*d91*		R^2
Food Products, Beverages and Tobacco							*lib94*			
	A11.1	0.06 (0.53)	-1.34 (-0.56)	-1.49 (-3.11)	0.24 (1.23)	0.05 (0.35)		-0.29 (-1.21)		*0.64*
	A11.2	0.03 (0.25)	-0.76 (-0.29)	-1.33 (-2.37)	0.18 (0.76)	0.13 (0.65)	-0.09 (-0.60)	-0.32 (-1.29)		*0.65*
							lib95			
	A11.3	0.03 (0.26)	-0.90 (-0.37)	-1.34 (-2.64)	0.17 (0.80)	0.14 (0.81)	-0.14 (-0.96)	-0.33 (-1.36)		*0.67*
							lib96			
	A11.4	0.05 (0.39)	-0.66 (-0.24)	-1.43 (-2.81)	0.19 (0.88)	0.08 (0.52)	-0.09 (-0.54)	-0.32 (-1.26)		*0.65*
Textiles and Leather Products							*lib94*			
	A11.5[2]	-0.13 (-0.47)	6.00 (1.06)	-0.55 (-0.45)	-0.05 (-0.20)	0.22 (0.61)		0.38 (0.67)		*0.40*
	A11.6[2]	-0.20 (-0.65)	7.46 (1.23)	-0.09 (-0.06)	-0.11 (-0.42)	0.40 (0.92)	-0.26 (-0.74)	0.25 (0.43)		*0.43*
							lib95			
	A11.7[2]	-0.17 (-0.56)	6.63 (1.12)	-0.30 (-0.23)	-0.10 (-0.36)	0.34 (0.79)	-0.19 (-0.54)	0.30 (0.51)		*0.42*
							lib96			
	A11.8[2]	-0.16 (-0.57)	8.58 (1.39)	-0.29 (-0.23)	-0.11 (-0.43)	0.32 (0.87)	-0.37 (-1.01)	0.24 (0.41)		*0.46*
Wood Products							*lib94*			
	A11.9	0.08 (0.68)	4.55 (1.82)	-1.27 (-2.46)	0.21 (1.43)	-0.16 (-1.07)		0.58 (2.24)		*0.78*
	A11.10	0.07 (0.53)	4.79 (1.74)	-1.19 (-1.94)	0.19 (1.08)	-0.13 (-0.65)	-0.04 (-0.25)	0.56 (2.05)		*0.78*
							lib95			
	A11.11	0.07 (0.53)	4.78 (1.82)	-1.18 (-2.09)	0.18 (1.09)	-0.11 (-0.61)	-0.08 (-0.49)	0.56 (2.06)		*0.78*
							lib96			
	A11.12	0.07 (0.56)	5.45 (1.93)	-1.18 (-2.18)	0.16 (-0.75)	-0.12 (-0.75)	-0.13 (-0.74)	0.54 (2.02)		*0.79*
Paper Products, Publishing and Printing							*lib94*			
	A11.13[1]	-0.00 (-0.05)	1.15 (0.65)	-0.54 (-1.51)	0.25 (1.19)	0.03 (0.28)		0.37 (2.08)		*0.63*
	A11.14[1]	-0.00 (-0.04)	1.15 (0.60)	-0.54 (-1.29)	0.25 (1.02)	0.03 (0.21)	0.00 (0.00)	0.37 (1.89)		*0.63*
							lib95			
	A11.15[1]	-0.01 (-0.18)	1.26 (0.69)	-0.47 (-1.24)	0.20 (0.88)	0.08 (0.52)	-0.06 (-0.53)	0.35 (1.82)		*0.64*
							lib96			
	A11.16[1]	-0.01 (-0.20)	1.85 (0.97)	-0.47 (-1.29)	0.17 (0.77)	0.08 (0.61)	-0.11 (-0.96)	0.32 (1.75)		*0.66*

(Continue overleaf)

(Continued)

Variable / m^i	*Eq.*	*Constant*	*ym*	*p*	m^i_{-1}	*lib86*	*lib94, lib95, lib96*	*d91*		R^2
Chemicals, Rubber and Plastic Products							*lib94*			
	A11.17	0.01 (0.28)	1.73 (1.23)	-0.57 (-2.00)*	0.09 (0.59)	0.02 (0.27)		0.30 (2.18)*		*0.73*
	A11.18	0.02 (0.40)	1.45 (0.96)	-0.65 (-2.03)*	0.12 (0.71)	-0.01 (-0.10)	0.05 (0.61)	0.33 (2.21)*		*0.74*
							lib95			
	A11.19	0.02 (0.33)	1.63 (1.11)	-0.61 (-2.00)*	0.10 (0.63)	0.00 (0.01)	0.04 (0.49)	0.32 (2.16)*		*0.73*
	A11.20[1]	-0.01 (-0.20)	1.85 (0.97)	-0.47 (-1.29)	0.17 (0.77)	0.08 (0.61)	-0.11 (-0.96)	0.32 (1.75)		*0.66*
Non-Metallic Mineral Products							*lib94*			
	A11.21	-0.11 (-0.68)	1.97 (0.64)	-0.97 (-1.52)	0.02 (0.12)	0.15 (0.77)		0.38 (1.29)		*0.60*
	A11.22	-0.10 (-0.56)	1.72 (0.50)	-1.04 (-1.40)	0.04 (0.18)	0.12 (0.49)	0.04 (0.21)	0.40 (1.25)		*0.60*
							lib95			
	A11.23	-0.11 (-0.63)	1.94 (0.59)	-0.98 (-1.42)	0.02 (0.12)	0.14 (0.63)	0.01 (0.06)	0.39 (1.22)		*0.60*
							lib96			
	A11.24	-0.12 (-0.73)	2.90 (0.84)	-0.89 (-1.34)	-0.00 (-0.00)	0.18 (0.90)	-0.13 (-0.66)	0.34 (1.07)		*0.62*
Basic Metals							*lib94*			
	A11.25	-0.05 (-0.30)	2.86 (0.75)	-1.24 (-1.58)	0.03 (0.15)	0.07 (0.33)		0.32 (0.85)		*0.55*
	A11.26	-0.03 (-0.17)	2.18 (0.53)	-1.44 (-1.65)	0.05 (0.24)	-0.00 (-0.03)	0.14 (0.60)	0.39 (0.96)		*0.56*
							lib95			
	A11.27	-0.04 (-0.24)	2.66 (0.67)	-1.32 (-1.58)	0.03 (0.16)	0.02 (0.11)	0.09 (0.42)	0.36 (0.89)		*0.55*
							lib96			
	A11.28	-0.06 (-0.31)	3.69 (0.87)	-1.18 (-1.45)	0.02 (0.13)	0.10 (0.42)	-0.13 (-0.54)	0.27 (0.67)		*0.56*
Machinery and Equipment							*lib94*			
	A11.29	-0.00 (-0.06)	2.07 (0.95)	-0.86 (-1.80)	0.22 (1.11)	0.03 (0.21)		0.27 (1.29)		*0.67*
	A11.30	0.01 (0.13)	1.53 (0.64)	-1.04 (-1.84)	0.27 (1.24)	-0.03 (-0.19)	0.08 (0.62)	0.31 (1.37)		*0.68*
							lib95			
	A11.31	-0.00 (-0.00)	1.94 (0.84)	-0.92 (-1.75)	0.24 (1.12)	0.00 (0.02)	0.04 (0.32)	0.29 (1.28)		*0.68*
							lib96			
	A11.32	-0.01 (-0.10)	2.50 (1.02)	-0.82 (-1.63)	0.21 (0.99)	0.04 (0.31)	-0.06 (-0.43)	0.25 (1.12)		*0.68*
Other Manufactures							*lib94*			
	A11.33	0.00 (0.03)	7.07 (1.74)	-1.21 (-1.39)	0.19 (0.98)	-0.07 (-0.28)		0.14 (0.35)		*0.62*
	A11.34	-0.01 (-0.06)	7.53 (1.70)	-1.06 (-1.04)	0.17 (0.77)	-0.01 (-0.03)	-0.08 (-0.33)	0.10 (0.24)		*0.63*
							lib95			
	A11.35	-0.01 (-0.06)	7.41 (1.75)	-1.07 (-1.13)	0.17 (0.79)	0.00 (0.00)	-0.12 (-0.50)	0.09 (0.22)		*0.63*
							lib96			
	A11.36	-0.01 (-0.07)	9.16 (2.11)*	-1.01 (-1.16)	0.14 (0.04)	0.01 (0.04)	-0.31 (-1.20)	0.03 (0.07)		*0.67*

Notes: Values in parenthesis correspond to "t"-statistics. The asterisk (*) for the "t" statistics denotes significance of the coefficient at the 5 percent level. [1] The estimation fails Functional Form test. [2] The estimation fails normality test.