

# **Trade Liberalisation, the Income Elasticity of Demand for Imports and Growth in Latin America**

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## **Abstract**

This paper applies the balance of payments constrained growth model to seventeen countries of Latin America over the period 1977-2002. The crucial parameter to estimate is the income elasticity of demand for imports which is done for Latin America as a whole, as well as for individual countries. As well as estimating over the whole period, the technique of rolling regressions is also used to test whether a trend increase can be discerned as a result of trade liberalisation. A trend increase is found for Latin America as a whole and for some individual countries, and the balance of payments equilibrium growth rate is a good predictor of growth performance in nine of the seventeen countries. There is no evidence that the balance of payments equilibrium growth rate has increased in Latin America as a result of trade liberalisation.

Key words: Latin America; Trade Liberalisation; Growth; Balance of Payments.

JEL Classification: C21, C22, F13, F32, F43.

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# Trade Liberalisation, the Income Elasticity of Demand for Imports and Growth in Latin America

## 1. Introduction

The countries of Latin America have undergone extensive trade liberalisation in the last twenty years or so, but their growth record has been relatively poor, despite the promises and expectations of the advocates of liberalisation. As Rodrik (2004) remarks in his recent WIDER lecture: “Latin America [during the 1990s] grew more slowly not only compared to other parts of the world... but also compared to its own performance in the 1960s and 1970s. That is a *striking* empirical fact, the importance of which it is hard to downplay. After all, Latin America of the 1960s and 1970s was a region of import substitution, macroeconomic populism, and protectionism, while the Latin America of the 1990s is a region of openness, privatisation and liberalisation. The cold fact is that per capita economic growth performance has been abysmal during the 1990s by any standards”.

One explanation is that the process of trade liberalisation in Latin America has been too drastic and sudden without giving time, or incentives, for producers to switch to the production of tradeable goods. The consequence has been a surge of imports, without a corresponding increase in the growth of exports, and output has grown below capacity which has led in many countries to a rise in unemployment and a fall in unskilled real wages. This contrasts with the experience of South East Asia in the 1960s and 1970s where the pace of import liberalisation was much slower, and was combined with an export-led growth strategy which kept the balance of payments in

equilibrium without the necessity for income adjustment. In their survey of balance of payments liberalisation in a selection of Latin American and Caribbean countries, Vos, Taylor and Paes de Barros (2002) remark: “higher import demand and typically lagging exports meant that the trade deficit went up for a given level of output” and “higher import propensities offset the growth impacts of export expansion that nearly all countries witnessed. Although exports gained importance as a source of growth...the gains do not seem to have been so strong as originally supposed by advocates of liberalisation”.

The purpose of this paper is to examine whether trade liberalisation in seventeen Latin American countries<sup>2</sup> has led to an increase in the income elasticity of demand for imports (allowing for the effect of real exchange rate changes on the growth of imports) which would slow economic growth for any given growth of exports unless there were compensating capital inflows. This is a test for Latin America of the balance of payments constrained growth model, originally developed by Thirlwall (1979).

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<sup>2</sup> The countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru, Uruguay, and Venezuela.

## 2. The Balance of Payments Constrained Growth Model

The central proposition of the balance of payments constrained growth model is that no country can grow faster than that rate consistent with balance of payments equilibrium on current account unless it can finance ever-growing deficits, which, in general, it cannot. There is a limit to the current account deficit, or external debt, of a country relative to its gross domestic product (GDP). Thirlwall's original model assumed strict current account balance over the long term, but the model can be extended to include permanent, sustainable capital inflows (Thirlwall and Hussain, 1982) or a fixed current account deficit, or debt, to GDP ratio (McCombie and Thirlwall, 1997; Barbosa-Filho, 2001; Moreno-Brid, 1998-99). It turns out that for most countries these extensions make very little difference empirically to the long run predictions of the model which is dominated by the rate of growth of export volume ( $x$ ) of a country (determined by world income growth and the income elasticity of demand for exports) relative to the income elasticity of demand for imports ( $\pi$ ), i.e.:

$$y_b = x / \pi \quad (1)$$

where  $y_b$  is the growth of income consistent with balance of payments equilibrium on current account.<sup>3</sup> This result can be shown (Thirlwall, 1982) to be the dynamic equivalent of the static Harrod foreign trade multiplier (Harrod, 1933).

To date, there has been a paucity of studies applying the balance of payments constrained growth model to Latin American countries. There are some individual

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<sup>3</sup> With a fixed debt to GDP ratio (McCombie and Thirlwall, 1997) or a fixed export to import ratio (Moreno-Brid, 1998), the growth rate can be shown to be:  $y_b^* = \theta x / [\pi - (1-\theta)]$ .  $\theta = X/(X+F) = (X/Y)/[X/Y + F/Y]$ , where  $X/Y$  is the ratio of exports to GDP and  $F/Y$  is the current account deficit to GDP ratio financed by capital inflows ( $F$ ). This makes very little difference to the basic result for reasonable values of the ratios. Suppose, for example, that the export ratio is 30 per cent, the current account deficit is 4 per cent of GDP, and  $\pi = 1.5$ , then  $y_b^* = 0.64 x$ , compared with  $0.67 x$ , assuming balance of payments equilibrium.

case studies, which are supportive, such as for Mexico (Moreno-Brid, 1998, 1999; López and Cruz, 2000; Pacheco-López, 2005); for Brazil (Ferreira and Canuto, 2003); for five Central American countries (Moreno-Brid and Pérez, 1999); and a wider study of 34 developing countries, including some in Latin America (Perraton, 2003), but there is no study for Latin America as a whole either taking all the major countries individually, or pooling the data. We have assembled a consistent data set of GDP growth; export growth; import growth; real exchange rate changes, and ‘world’ income growth (proxied by the growth of the US economy) for seventeen countries of Latin America over the period 1977 to 2002, which we use to do a number of estimations.<sup>4</sup>

Firstly, we pool the data; estimate an income elasticity of demand for imports for the whole region, and fit the basic model of  $y_b = x / \pi$  (equation 1 above). We then compare  $y_b$  and actual GDP growth ( $y$ ) over the whole period. Secondly, we do the same exercise as above for individual countries using appropriate time series econometric techniques. The McCombie test (McCombie, 1989) is then used to see whether the estimated income elasticity of demand for imports ( $\hat{\pi}$ ) is significantly different from the income elasticity ( $\pi^*$ ) that would make the actual GDP growth ( $y$ ) equal to the balance of payments equilibrium growth rate ( $y_b$ ). If it is not significantly different, then  $y_b$  will be a good predictor of  $y$ .

Thirdly, we run rolling regressions (first used in this field by Atesoglu, 1993, 1994) using pooled data taking overlapping periods. Thirteen overlapping periods are taken starting with 1977-1990 and finishing with 1989-2002. Trade liberalisation may be

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<sup>4</sup> The data sources are: the World Development Indicators CD-Rom 2004, World Bank; Instituto de Pesquisa Econômica Aplicada ([www.ipea.gov.br](http://www.ipea.gov.br)); Banco Central de Nicaragua ([www.bcn.gob.ni](http://www.bcn.gob.ni)).

expected to gradually raise the income elasticity of demand for imports through time, and to constrain growth unless export growth improves. The basic model is then applied to each overlapping period and the predicted growth rate compared with the actual growth rate, also using the McCombie test.

Fourthly, we do the same rolling regression exercise as above for each individual country in the sample.

We conclude the paper with a brief commentary on the process of trade liberalisation in Latin America, and the lessons to be learned.

### **3. Fitting the Balance of Payments Constrained Growth Model Using Pooled Data**

The derivation of the balance of payments equilibrium growth rate (or the dynamic Harrod trade multiplier result) of  $y_b = x / \pi$  is well known, and need not be repeated here (see the collection of essays in McCombie and Thirlwall, 2004, for the original derivation of the model and its application). The crucial parameter to be estimated for testing the model is the income elasticity of demand for imports ( $\pi$ ). To do this, we specify a conventional multiplicative import demand function of the form:

$$M_t = A_t (RER_t)^\psi Y_t^\pi \quad (2)$$

where  $M$  is the volume of imports;  $RER$  is the real exchange rate;<sup>5</sup>  $\psi$  is the price elasticity of demand for imports ( $<0$ );  $Y$  is domestic income (as a proxy for

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<sup>5</sup> Measured as the domestic price of foreign currency (the nominal exchange rate), multiplied by the ratio of foreign to domestic prices. A rise in  $RER$  represents a depreciation of the currency.

expenditure),  $\pi$  is the income elasticity of demand for imports ( $>0$ ), and  $t$  is a time subscript. Taking logs, differentiating with respect to time, and adding a constant term gives an estimating equation of the form:

$$m_t = a + \psi (\text{rer}) + \pi (y) + e_t \quad (3)$$

where lower case letters represent the rate of growth of the variables and  $e_t$  is an error term with the usual properties. Since the number of countries (17) is less than the number of time series observations (26), we use a pooled time-series/cross section estimate to determine the value of  $\pi$ , allowing for groupwise heteroscedastic and correlated regressions with group specific autocorrelation.<sup>6</sup> The fitted result with t-values in brackets is:

$$m_t = -0.32 - 0.069 \text{ rer} + 2.29 y \quad (4)$$

*t-statistic* (-0.92) (-5.74) (32.79)

*Diagnostic statistics*

Likelihood Ratio Statistic: 199.2  
 Number of Observations: 425

Both variables have the expected sign and the income elasticity of demand is well determined with an estimate of 2.29. The average growth of exports ( $x$ ) over all countries and all years is 5.49 per cent per annum. Fitting the basic model of  $y_b = x / \pi$  gives a predicted growth rate for the Latin American region as a whole of  $5.49/2.29 = 2.40$  per cent. This compares with the actual growth rate of the region of 2.67 per cent. The actual growth rate and balance of payments constrained growth rate are clearly very close. Using the McCombie test, the income elasticity of demand for imports that would make  $y = y_b$  is 2.05. This is not significantly different from the calculated  $\pi$  of 2.29.

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<sup>6</sup> Using the econometric software package LIMDEP.

#### **4. Fitting the Balance of Payments Constrained Growth Model to Individual Countries**

In this section we estimate  $\pi$  for each of the 17 countries using equation (3). First we test the order of integration of the variables using the Augmented Dickey-Fuller test. For ten countries all the variables are  $I(0)$ : Argentina, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico, Nicaragua, Paraguay, Peru, and Venezuela. For the other seven countries, some of the variables are  $I(0)$  and others are  $I(1)$ . Before proceeding to estimation for these countries we therefore use the Pesaran *et. al.* (2001) test to assess whether there is a long run relationship between the variables regardless of their order of integration. Six of the seven countries (Bolivia, Brazil, Chile, El Salvador, Guatemala, and Uruguay) pass the test either at the 95 or 90 per cent confidence level.<sup>7</sup> The exception is Colombia, and is excluded from the sample.

The results of fitting equation (3) to the data for individual countries are shown in Table 1. The real exchange rate parameter ( $\psi$ ) is significantly negative in five countries –Argentina, Chile, Costa Rica, Mexico and Peru– but the magnitude of the coefficient is very small. In the remaining countries, however, the coefficient is positive or insignificant suggesting that the exchange rate is not an efficient balance of payments adjustment weapon at least for curbing imports. By contrast, the income elasticity of demand for imports ( $\pi$ ) is a well-determined parameter in fourteen out of the sixteen countries, which enables the balance of payments constrained growth model to be fitted to these countries. The two countries where the income elasticity of

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<sup>7</sup> The F statistics for each country are available on request.

**Table 1**  
**Import Demand Equation, 1977-2002**

Country	Constant	$\pi$	$\psi$
Argentina	4.66 (1.68)	3.66 (7.58)	-0.13 (-1.91)
Bolivia	-0.16 (-0.06)	1.82 (2.25)	0.00 (0.25)
Brazil	-0.26 (-0.08)	1.59 (2.25)	-0.31 (-1.82)
Chile	0.04 (0.01)	2.03 (6.17)	-0.54 (-3.91)
Costa Rica	-1.55 (-0.80)	2.27 (6.34)	-0.20 (-3.25)
Dom. Rep.	3.16 (0.48)	0.92 (0.76)	0.04 (0.26)
Ecuador	-1.17 (-0.42)	1.83 (2.62)	0.00 (0.09)
El Salvador	1.65 (0.86)	2.47 (6.68)	0.09 (0.68)
Guatemala	-7.34 (-1.81)	3.78 (3.60)	0.18 (0.77)
Honduras	-1.69 (-0.83)	1.41 (3.22)	-0.01 (-0.12)
Mexico	0.06 (0.01)	3.17 (5.40)	-0.18 (-2.71)
Nicaragua	5.08 (1.06)	0.97 (1.59)	-0.00 (-0.28)
Paraguay	0.29 (0.04)	2.48 (2.53)	-0.24 (-0.99)
Peru	0.45 (0.22)	1.56 (4.85)	-0.37 (-2.98)
Uruguay	1.42 (1.09)	2.13 (6.27)	-0.07 (-0.79)
Venezuela	-0.39 (-0.10)	3.76 (4.59)	0.15 (0.74)

Note: t-values are in parentheses.

demand for imports is not significant are the Dominican Republic and Nicaragua. The magnitudes of the estimated elasticities are generally higher than previous studies have found for earlier time periods. Senhadji's, (1998) study of import demand functions for 66 countries contains twelve of the countries taken here and covers the period 1960 to 1993. Perraton's (2003) study of 51 developing countries found 34 countries with significant income elasticities of demand for imports over the period 1973 to 1995 and contains nine of our sample of countries. Their results and ours are compared in Table 2. Our generally higher estimates for most countries no doubt partly, if not mainly, reflect the process of trade liberalisation which gathered momentum in many countries in the 1990s.

**Table 2**  
**A Comparison of the Estimates of the Income Elasticities**  
**of Demand for Imports**

Country	Our Estimates 1977-2002	Senhadji Estimates 1960-1993 <sup>1</sup>	Perraton Estimates 1973-1995 <sup>2</sup>
Argentina	3.66	1.21	3.01
Bolivia	1.82	n.a.	0.50
Brazil	1.59	1.24	1.77
Chile	2.03	1.87	n.a.
Costa Rica	2.27	1.21	1.76
Dom. Rep.	0.92	0.86	1.15
Ecuador	1.83	n.a.	0.24
El Salvador	2.47	1.47	n.a.
Guatemala	3.78	n.a.	n.a.
Honduras	1.41	0.74	0.56
Mexico	3.17	1.31	n.a.
Nicaragua	0.97	0.57	n.a.
Paraguay	2.48	1.58	n.a.
Peru	1.56	0.50	0.94
Uruguay	2.13	5.48	n.a.
Venezuela	3.76	n.a.	2.78

Notes: <sup>1</sup> Long-run estimate using the Phillips-Hansen Fully Modified Estimator.

<sup>2</sup> Estimated using an Autoregressive Distributed Lag Model.

The results of fitting the balance of payments growth model for each of the 16 countries are shown in Table 3. The first column gives the growth of exports ( $x$ ); the second column gives the estimated income elasticity of demand for imports ( $\pi$ ); the third column gives the estimated balance of payments equilibrium growth rate ( $y_b$ ); the fourth column gives the actual growth rate ( $y$ ) for comparison; the fifth column gives the deviation between the actual and balance of payments equilibrium growth rate; the sixth column gives the calculated income elasticity of demand for imports ( $\pi^*$ ) that makes  $y = y_b$ ; and the last column gives the McCombie test of whether the estimated  $\pi$  is equal to  $\pi^*$ . It can be seen that the McCombie test is passed for nine countries, and fails for seven. For the countries that pass the test the actual growth rate is very close to the balance of payments equilibrium growth rate. For those that fail the test, some have growth rates below  $y_b$ , suggesting the accumulation of balance of

**Table 3**  
**Actual vs. Predicted Growth Rate, 1977-2002**

Country	Export Growth Rate x	Income Elasticity of Demand for Imports $\pi^a$	Balance of Payments Equilibrium Growth Rate $y_b = x/\pi$	Actual Growth Rate y	Deviation between y and $y_b$	Calculated Income Elasticity of Demand to make $y = y_b$ $\pi^*$	Absolute value of the t- test <sup>b</sup>
Argentina	6.07	3.66 (7.58)	1.66	1.33	-0.33	4.57	1.89*
Bolivia	3.46	1.82 (2.25)	1.90	1.89	0.00	1.82	0.00
Brazil	8.07	1.59 (2.25)	5.08	2.70	-2.38	2.99	1.99*
Chile	8.62	2.03 (6.17)	4.24	5.50	1.25	1.57	1.41
Costa Rica	7.38	2.27 (6.34)	3.25	3.94	0.69	1.87	1.11
Dom. Rep.	7.84	0.92 (0.76)*	8.52	4.23	-4.29	1.85	0.77
Ecuador	5.38	1.83 (2.62)	2.94	2.57	-0.37	2.09	0.38
El Salvador	5.03	2.47 (6.68)	2.04	1.66	-0.37	3.02	1.50
Guatemala	2.14	3.78 (3.60)	0.57	2.93	2.36	0.73	2.90*
Honduras	2.44	1.41 (3.22)	1.73	3.41	1.68	0.72	1.58
Mexico	11.38	3.17 (5.40)	3.59	3.30	-0.29	3.45	0.47
Nicaragua	1.40	0.97 (1.59)*	1.44	0.45	-0.99	3.09	3.45*
Paraguay	7.01	2.48 (2.53)	2.83	3.73	0.91	1.88	0.61
Peru	5.25	1.56 (4.85)	3.37	1.93	-1.44	2.72	3.59*
Uruguay	4.05	2.13 (6.27)	1.90	1.43	-0.47	2.84	2.08*
Venezuela	1.74	3.76 (4.59)	0.46	1.13	0.66	1.54	2.70*

Notes: <sup>a</sup> The asterisk shows that  $\pi$  is not statistically significant at the 95 per cent confidence level. <sup>b</sup> The t-statistic is based on the null hypothesis that  $\pi = \pi^*$ . The asterisk (\*) denotes that  $\pi$  differs significantly from  $\pi^*$  at the 95 per cent confidence level.

payments surpluses (e.g. Argentina, Brazil, Nicaragua, Peru and Uruguay) and the others have growth rates above  $y_b$ , indicating cumulative deficits (e.g. Guatemala and Venezuela).

## **5. Estimating the Income Elasticity of Demand for Imports ( $\pi$ ) using Rolling Regressions with Pooled Data**

We now turn to estimating the income elasticity of demand for imports ( $\pi$ ) for the Latin American region as a whole using rolling regressions taking 13 overlapping periods starting from 1977-1990 and finishing in 1989-2002. The technique was first used by Atesoglu (1993, 1994) for Germany and the US, respectively, and has also been used by Hieke (1997) and McCombie (1997). The technique enables us to see the evolution of  $\pi$  over time against a background of trade liberalisation in all the countries under review. The reduction of tariffs, import quotas and licenses might be expected to raise the income elasticity of demand for imports through time. With knowledge of export growth in the same overlapping periods we can calculate  $y_b$  for each period and then compare actual  $y$  with  $y_b$ , using the McCombie test. Since the number of countries is greater than the number of time series observations, we use a fixed effects panel data model (including the real exchange rate) to estimate  $\pi$ .<sup>8</sup> The results are shown in Table 4.

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<sup>8</sup> Using the econometric software package LIMDEP. The full equations for each sub-period are available on request.

**Table 4**  
**Actual vs. Predicted Growth Rate using Rolling Regressions for**  
**Latin America as a Whole**

Time Period	Export Growth Rate x	Income Elasticity of Demand for Imports $\pi$	Balance of Payments Equilibrium Growth Rate $y_b = x/\pi$	Actual Growth Rate y	Calculated Income Elasticity of Demand to make $y = y_b$ $\pi'$	Absolute value of the t- test <sup>a</sup>
1977-1990	5.38	2.04 (8.60)	2.64	2.17	2.48	1.84*
1978-1991	5.17	2.24 (9.22)	2.31	2.04	2.53	1.21
1979-1992	4.98	2.48 (9.69)	2.01	2.10	2.37	0.42
1980-1993	4.56	2.34 (9.00)	1.95	2.13	2.14	0.76
1981-1994	5.37	2.45 (9.41)	2.19	2.21	2.43	0.08
1982-1995	6.00	2.31 (8.52)	2.60	2.36	2.54	0.86
1983-1996	6.78	2.05 (7.27)	3.31	2.83	2.40	1.22
1984-1997	7.11	2.25 (9.30)	3.16	3.35	2.12	0.53
1985-1998	6.97	2.34 (9.82)	2.98	3.38	2.06	1.17
1986-1999	6.96	2.53 (10.82)	2.75	3.32	2.10	1.85*
1987-2000	7.00	2.39 (10.47)	2.93	3.33	2.10	1.26
1988-2001	6.81	2.74 (11.73)	2.49	3.13	2.18	2.41*
1989-2002	6.26	2.82 (11.76)	2.22	3.00	2.09	3.06*

Notes: Numbers within parentheses are t-values. <sup>a</sup> The t-statistic is based on the null hypothesis that  $\pi = \pi^*$ . The asterisk (\*) denotes that  $\pi$  differs significantly from  $\pi^*$  at the 95 per cent confidence level. Diagnostic statistics for each sub-period are available on request.

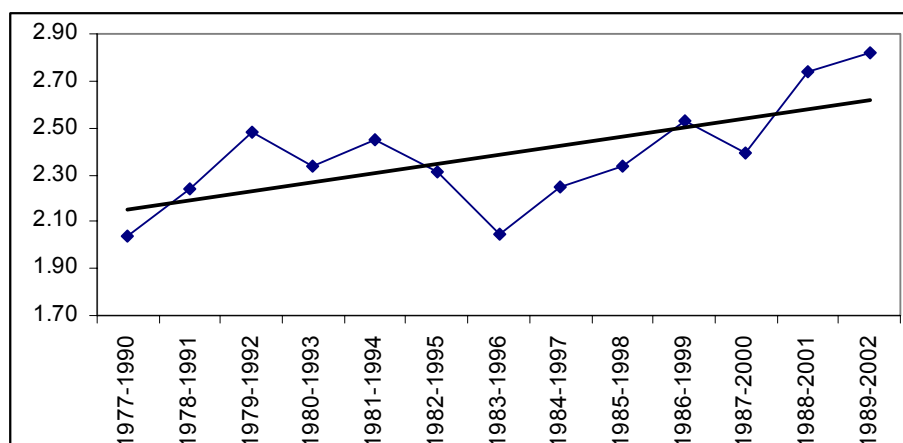
The estimated  $\pi$  is significant for each sub-period, and can be seen to have a trend increase, starting at 2.04 in 1977-1990 and finishing at 2.82 in 1989-2002 (see Graph

1). The estimated trend equation is:

$$\pi = 2.10 + 0.039 t \quad R^2 = 0.44$$

t-statistic (20.04)      (2.94)

**Graph 1**  
**Estimation of  $\pi$  for Latin America as a Whole**



Columns 5 and 6 of Table 4 show the McCombie test of the basic model for each of the sub-periods. In only four sub-periods (1977-90, 1986-99, 1988-01 and 1989-02) is the hypothesis rejected that  $y_b$  is a good predictor of  $y$ .

Another way of testing whether trade liberalisation has increased the sensitivity of imports to domestic income growth is by interacting domestic income growth with the year of trade liberalisation in each country using the estimating equation:

$$m_t = \alpha + \psi (\text{rer}) + \pi (y) + \beta (D y) + e_t \quad (5)$$

where  $D = 1$  from the year of liberalisation in each country and zero otherwise;  $\pi$  is the income elasticity of demand for imports before trade liberalisation and  $\pi + \beta$  is the income elasticity after liberalisation. The estimated equation using pooled/time series cross section data is:

$$m_t = -0.74 - 0.066 (\text{rer}) + 2.08 (y) + 0.55 (Dy) \quad (6)$$

*t-statistic* (-2.21) (-5.56) (25.07) (4.44)

*Diagnostic statistics*

Likelihood Ratio: 195.84

Number of observations: 425

The slope coefficients of  $y$  and  $Dy$  are positive and statistically significant. The income elasticity before trade liberalisation is 2.08 and after trade liberalisation is 2.63. This alternative test confirms the earlier result from the rolling regressions (Table 4) that the period of trade liberalisation has been associated with a rise in the income elasticity of demand for imports. If we take the growth of exports before and after trade liberalisation in all the countries, the predicted growth rate before trade liberalisation is:

$$y_b = \frac{4.61}{2.08} = 2.22$$

and, after trade liberalisation is:

$$y_b = \frac{5.93}{2.63} = 2.25$$

The two growth rates hardly differ. Export growth has been 1.32 per cent per annum higher post-liberalisation but this has been offset by an increase in  $\pi$ . These results compare with the actual growth of output of 2.02 and 3.23 per cent, in the pre- and post-liberalisation periods, respectively. The higher growth rate than predicted after liberalisation is associated with higher trade deficits financed by capital inflows (Pacheco-López and Thirlwall, 2005).

## **6. Estimating the Income Elasticity of Demand for Imports using Rolling Regressions for Individual Countries**

We use the same technique of rolling regressions for estimating the income elasticity of demand for imports and its evolution through time for each individual country. The results are given in Table 5 (which also gives the year in which trade liberalisation took place in a significant way). The income elasticity of demand for each sub-period is not always significant, but for the vast majority of countries the estimated  $\pi$  is significant for the majority of sub-periods.<sup>9</sup> The estimated  $\pi$  is plotted for each country in Graph 2. Some interesting patterns of behaviour are exhibited. For some countries, there is a gradual increase in the elasticity over the whole period e.g. in Argentina, Brazil and Peru. In several countries there seems to have been a sudden increase from the mid-1980s, as in Bolivia, Chile, the Dominican Republic,

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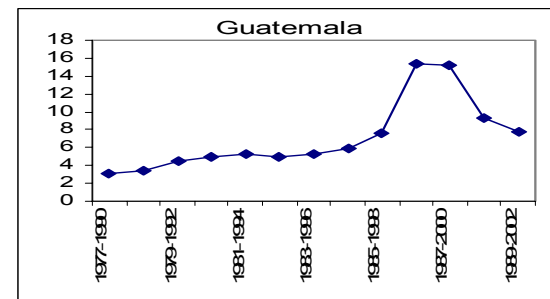
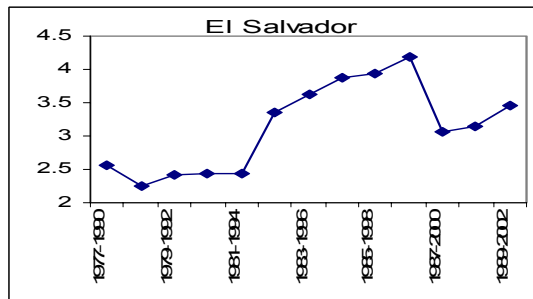
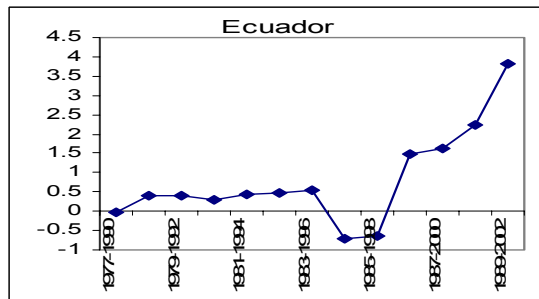
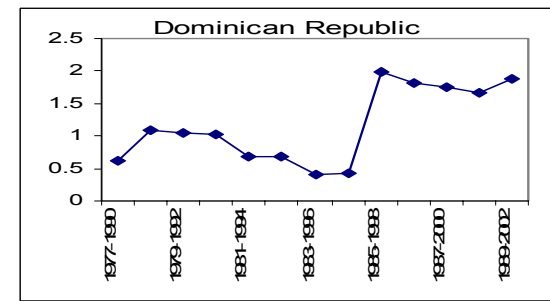
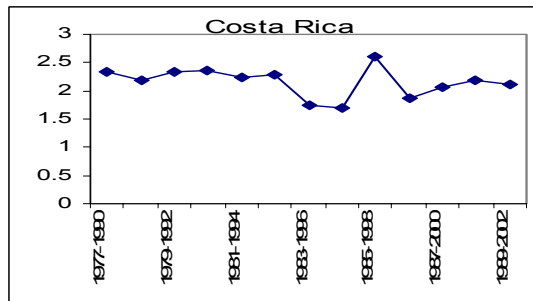
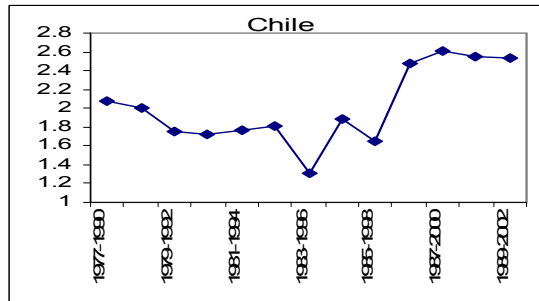
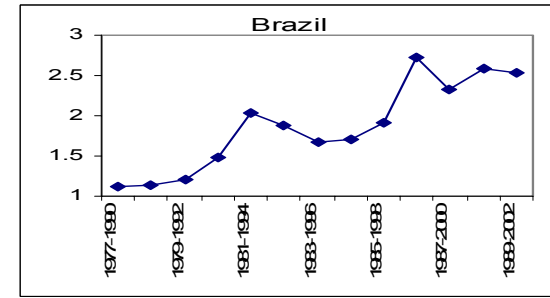
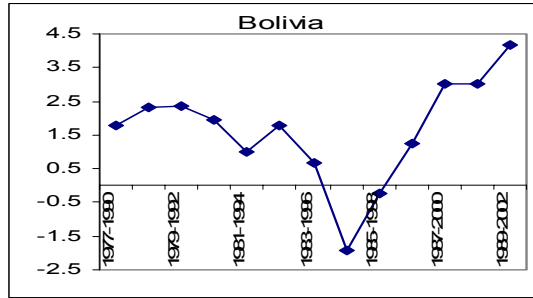
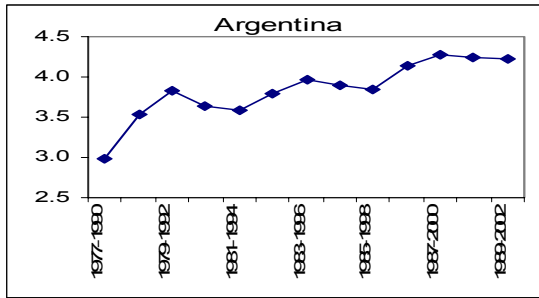
<sup>9</sup> We also tried to test for a structural break in the income elasticity of demand for imports for each country by interacting the growth rate ( $y$ ) with the year of trade liberalisation, but only in three countries (Brazil, Ecuador and Guatemala) was the slope dummy significant. This suggests that the effect of liberalisation on the income elasticity of demand for imports is more gradual in most countries and is difficult to pick up using a sudden structural break dummy.

**Table 5**  
**Rolling Regressions of the Income Elasticity of Demand for Imports**  
(year of liberalisation in brackets)

	Argentina (1991)	Bolivia (1985)	Brazil (1991)	Chile (1985)	Costa Rica (1986)	Dom. Rep. (1991)	Ecuador (1991)	El Salvador (1989)
1977-1990	2.99 (3.88)	1.80 (1.29)	1.12 (1.83)	2.08 (5.57)	2.34 (5.34)	0.61 (0.29)	-0.03 (-0.03)	2.57 (4.51)
1978-1991	3.54 (4.34)	2.31 (1.71)	1.13 (1.79)	2.01 (5.39)	2.19 (4.59)	1.08 (0.50)	0.40 (0.49)	2.26 (3.96)
1979-1992	3.82 (4.68)	2.36 (1.73)	1.21 (1.89)	1.75 (5.14)	2.34 (5.37)	1.04 (0.52)	0.41 (0.47)	2.41 (4.64)
1980-1993	3.63 (4.22)	1.96 (1.47)	1.49 (1.81)	1.73 (5.25)	2.35 (5.97)	1.03 (0.51)	0.29 (0.33)	2.44 (4.93)
1981-1994	3.58 (4.59)	0.98 (0.79)	2.03 (2.48)	1.76 (5.31)	2.24 (5.59)	0.69 (0.34)	0.43 (0.46)	2.44 (4.14)
1982-1995	3.79 (5.00)	1.77 (0.85)	1.88 (1.83)	1.81 (5.36)	2.29 (5.95)	0.69 (0.35)	0.46 (0.50)	3.36 (4.76)
1983-1996	3.97 (5.29)	0.66 (0.65)	1.68 (1.68)	1.31 (3.11)	1.74 (2.91)	0.41 (0.23)	0.53 (0.52)	3.62 (3.45)
1984-1997	3.90 (6.19)	-1.94 (-1.68)	1.70 (1.48)	1.88 (3.35)	1.70 (2.35)	0.42 (0.25)	-0.70 (-0.76)	3.88 (3.92)
1985-1998	3.85 (6.03)	-0.22 (-0.14)	1.92 (1.77)	1.65 (3.33)	2.60 (3.59)	1.98 (3.40)	-0.64 (-0.71)	3.93 (3.74)
1986-1999	4.13 (6.62)	1.26 (0.74)	2.72 (2.57)	2.47 (4.69)	1.88 (2.12)	1.81 (2.94)	1.49 (1.63)	4.18 (3.55)
1987-2000	4.28 (7.55)	3.03 (2.18)	2.32 (1.91)	2.61 (4.10)	2.07 (2.59)	1.76 (3.01)	1.63 (1.69)	3.06 (2.91)
1988-2001	4.25 (7.88)	3.03 (2.02)	2.59 (2.36)	2.55 (4.74)	2.19 (3.30)	1.67 (2.76)	2.22 (2.32)	3.15 (3.09)
1989-2002	4.23 (7.63)	4.16 (3.03)	2.53 (2.01)	2.53 (4.72)	2.12 (3.20)	1.87 (3.20)	3.80 (5.53)	3.46 (3.28)

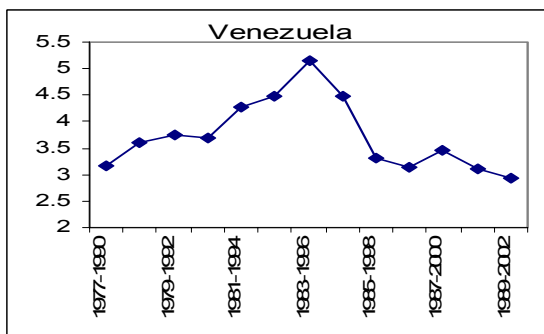
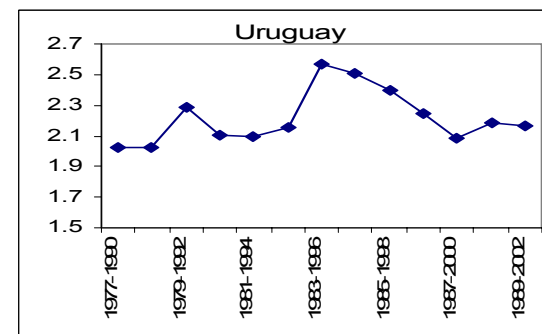
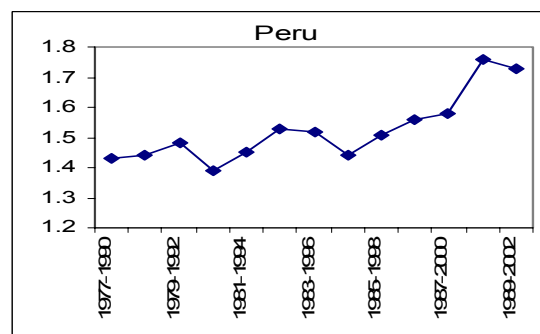
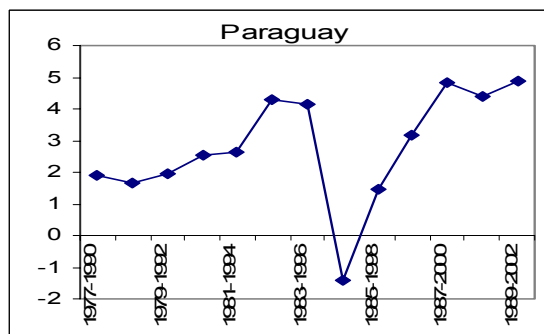
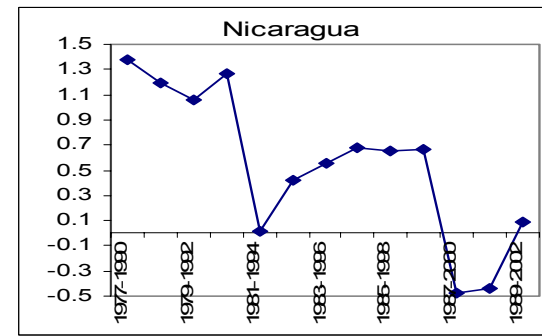
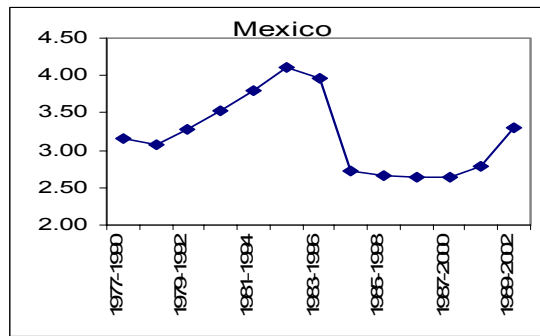
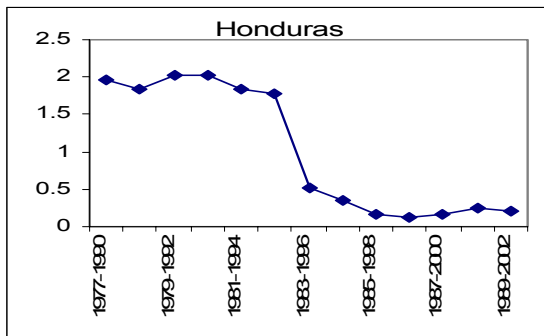
	Guatemala (1986)	Honduras (1991)	Mexico (1986)	Nicaragua (1991)	Paraguay (1989)	Peru (1991)	Uruguay (1990)	Venezuela (1989)
1977-1990	3.15 (2.41)	1.97 (2.96)	3.15 (3.27)	1.38 (1.51)	1.92 (1.29)	1.43 (2.98)	2.02 (3.70)	3.17 (2.17)
1978-1991	3.49 (2.35)	1.83 (2.31)	3.08 (3.98)	1.19 (1.23)	1.66 (1.10)	1.44 (2.95)	2.02 (3.41)	3.60 (2.58)
1979-1992	4.51 (2.67)	2.03 (2.05)	3.29 (4.11)	1.06 (1.12)	1.93 (1.22)	1.48 (3.26)	2.29 (3.95)	3.74 (2.75)
1980-1993	5.02 (3.16)	2.03 (2.18)	3.52 (3.96)	1.27 (0.70)	2.56 (1.49)	1.39 (3.14)	2.11 (3.51)	3.68 (2.82)
1981-1994	5.29 (3.62)	1.83 (2.04)	3.80 (3.52)	0.01 (0.01)	2.61 (1.05)	1.45 (3.64)	2.10 (3.81)	4.27 (3.23)
1982-1995	5.02 (3.47)	1.78 (2.22)	4.11 (4.34)	0.42 (0.34)	4.30 (1.62)	1.53 (3.73)	2.16 (4.30)	4.47 (3.33)
1983-1996	5.23 (2.85)	0.52 (1.07)	3.96 (4.68)	0.56 (0.56)	4.13 (1.22)	1.52 (3.70)	2.57 (4.26)	5.14 (4.09)
1984-1997	5.91 (2.41)	0.36 (0.55)	2.72 (4.11)	0.68 (0.67)	-1.43 (-0.34)	1.44 (3.15)	2.51 (7.36)	4.47 (3.36)
1985-1998	7.57 (3.05)	0.16 (0.37)	2.67 (4.11)	0.65 (0.67)	1.47 (0.49)	1.51 (4.02)	2.40 (7.31)	3.32 (3.79)
1986-1999	15.32 (3.52)	0.13 (0.38)	2.65 (4.02)	0.67 (0.71)	3.19 (1.07)	1.56 (3.84)	2.25 (7.15)	3.14 (4.20)
1987-2000	15.26 (2.56)	0.17 (0.51)	2.64 (3.65)	-0.47 (-0.54)	4.83 (1.79)	1.58 (3.66)	2.08 (6.12)	3.47 (5.20)
1988-2001	9.34 (2.74)	0.25 (0.79)	2.79 (3.92)	-0.44 (-0.50)	4.39 (1.69)	1.76 (3.87)	2.19 (6.54)	3.11 (4.37)
1989-2002	7.73 (2.61)	0.21 (0.63)	3.30 (10.82)	0.09 (0.07)	4.86 (2.10)	1.73 (3.18)	2.17 (6.46)	2.93 (3.99)

**Graph 2**  
**Income Elasticity of Demand for Imports Using Rolling Regressions**



(Graph 2 continue overleaf)

(Graph 2 continues)



Guatemala and Paraguay. On the other hand, in Honduras, Nicaragua and Venezuela there seems to have been a decline in the elasticity, while in Costa Rica and Uruguay the elasticity seems to have been relatively constant.

With the rolling regression estimates, the balance of payments constrained growth model can be tested for each individual country, again using the McCombie test. The results are reported in full in Appendix 1. Table 6 show the number of sub-periods (out of thirteen) in which the test is passed.

**Table 6**  
**The McCombie Test for Sub-Periods using Rolling Regressions**

Country	Number of sub-periods in which $y_b$ is a good predictor of $y$	Country	Number of sub-periods in which $y_b$ is a good predictor of $y$
Argentina	4	Guatemala	0
Bolivia	7	Honduras	7
Brazil	8	Mexico	8
Chile	9	Nicaragua	6
Costa Rica	13	Paraguay	12
Dom. Rep.	10	Peru	2
Ecuador	1	Uruguay	4
El Salvador	3	Venezuela	2

It can be seen that  $y_b$  is a good predictor of output growth in the majority of sub-periods in eight of the countries in the sample, all of which (except Brazil) passed the McCombie test when applying the model over the whole period 1977-2002 (see Table 3). These countries are Bolivia, Chile, Costa Rica, Dominican Republic, Honduras, Mexico and Paraguay. In the countries where the test is not passed in the majority of sub-periods, they also fail the test over the whole period, except Ecuador and El Salvador. These two countries remain a puzzle.

## 7. Conclusion

The broad purpose of trade liberalisation is to improve the overall macroeconomic performance of a country; in particular to achieve a faster rate of growth of output and living standards consistent with a sustainable balance of payments. If the balance of payments deteriorates with liberalisation, there are only three choices: an increase in capital inflows; adjustment of the exchange rate, or slower growth of GDP. Capital inflows create problems of indebtedness if the flows are not in the form of concessional aid or foreign direct investment. Depreciation of the nominal exchange rate may not translate into a fall of the real exchange rate because of domestic inflation, but even if it does it will not be effective in reconciling the conflict between output growth and the balance of payments if the Marshall-Lerner condition is not satisfied. The only alternative may be slower growth to adjust import demand to export growth. This is the central message of the balance of payments constrained growth model. In another paper (Pacheco-López and Thirlwall, 2005), we explicitly test whether trade liberalisation in the seventeen Latin American countries analysed here has improved or worsened the growth/balance of payments trade-off, and we find that only in Chile and Venezuela is it possible to say with some confidence that the trade-off has improved.<sup>10</sup> In the other countries there has either been a significant deterioration in the trade-off or no change. It is true that nine of the seventeen countries grew faster post-liberalisation than pre-liberalisation, but at the expense of a wider trade or current account deficit.

What we show explicitly in this paper is that the growth performance of many of the Latin American countries can be approximated by their balance of payments

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<sup>10</sup> In Chile the process of trade liberalisation was more gradual, and Venezuela has been helped by oil.

equilibrium growth rate which has not changed significantly over the years. Using the rolling regression estimates for Latin America as a whole (Table 4) shows no trend increase in the rate from 1977-1990 to 1989-2002. The rate stays at roughly 2.5 per cent per annum. The experience of individual countries is mixed (Appendix 1). For some countries the calculations are erratic, and some countries show a marked trend decrease in  $y_b$  (e.g. Brazil, the Dominican Republic and Paraguay). Other countries are static: Mexico, Chile and Uruguay. Only in Costa Rica, El Salvador, Honduras, Peru and Venezuela does there seem to be some improvement. Trade liberalisation will only raise substantially the growth of GDP if it raises export growth by more than in proportion to the rise in the income elasticity of demand for imports, but this has not occurred in the vast majority of countries including the big ones of Argentina, Brazil, Mexico and Chile. By this criterion, trade liberalisation has not been a success.

These results have implications for the practice and sequencing of trade liberalisation. In Latin America, liberalisation has taken place too quickly without time for the domestic economy to adjust to exporting and competing with imports. Trade liberalisation, if it is to be successful, needs to be implemented with a trade strategy. The process of liberalisation has also been inequitable. All the studies show that wage inequality and the personal distribution of income (measured by the Gini ratio or the percentage of total income received by the bottom quartile of the population) has become more unequal in the period since liberalisation because employment and real wages have fallen in the import-competing sectors, while the demand for labour with skills and schooling has increased because of increases in capital-good imports and foreign direct investment (see Vos, *et.al.* 2003; Goldberg and Pavcnik, 2004; Milanovic, 2005). At the same time, governments have lost tax revenue from the

reduction in import duties. There is a strong equity and tax argument (as well as a balance of payments protection argument) for retaining high duties on luxury consumption-good imports. These lessons and arguments need heading in future discussions in the Latin American region.

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**Appendix 1**  
**Actual vs. Predicted Growth Rates using Rolling Regressions<sup>1</sup>**

<b>Argentina</b>	x	y	y <sub>b</sub>	π	π*	t
1977-1990	5.93	0.21	1.98	2.99	27.76	32.17*
1978-1991	3.72	0.62	1.05	3.54	5.97	2.98*
1979-1992	3.01	1.80	0.79	3.82	1.67	2.63*
1980-1993	3.52	1.49	0.97	3.63	2.36	1.47*
1981-1994	4.98	1.61	1.39	3.58	3.09	0.62
1982-1995	6.22	1.81	1.64	3.79	3.43	0.48
1983-1996	6.48	2.56	1.63	3.97	2.53	1.92*
1984-1997	7.17	2.86	1.84	3.90	2.50	2.22*
1985-1998	8.11	2.98	2.11	3.85	2.72	1.77*
1986-1999	6.91	3.28	1.67	4.13	2.11	3.24*
1987-2000	7.84	2.66	1.83	4.28	2.94	2.36*
1988-2001	8.28	2.14	1.95	4.25	3.87	0.70
1989-2002	7.17	1.54	1.69	4.23	4.64	0.74

<b>Bolivia</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	1.40	0.78	0.53	1.80	2.65	0.60
1978-1991	2.07	0.90	0.55	2.31	3.75	1.06
1979-1992	2.36	1.00	0.52	2.36	4.52	1.58*
1980-1993	2.63	1.34	0.82	1.96	3.21	0.94
1981-1994	4.05	4.13	1.25	0.98	3.24	1.81*
1982-1995	4.61	2.60	1.56	1.77	2.95	0.85
1983-1996	5.84	8.84	2.16	0.66	2.71	2.01*
1984-1997	5.55	-2.86	2.80	-1.94	1.98	3.41*
1985-1998	6.45	-29.30	3.17	-0.22	2.03	1.49*
1986-1999	6.87	5.45	3.32	1.26	2.07	0.47
1987-2000	6.43	2.12	3.67	3.03	1.75	0.92
1988-2001	7.16	2.36	3.60	3.03	1.99	0.70
1989-2002	7.57	1.82	3.59	4.16	2.11	1.50*

<b>Brazil</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	8.73	7.79	2.87	1.12	3.04	3.13*
1978-1991	9.22	8.16	2.63	1.13	3.50	3.74*
1979-1992	9.02	7.45	2.37	1.21	3.81	4.07*
1980-1993	9.08	6.09	2.23	1.49	4.07	3.13*
1981-1994	8.01	3.95	2.00	2.03	4.00	2.41*
1982-1995	6.39	3.40	2.62	1.88	2.44	0.54
1983-1996	7.09	4.22	2.77	1.68	2.56	0.88
1984-1997	6.86	4.04	3.25	1.70	2.11	0.36
1985-1998	5.56	2.90	2.88	1.92	1.93	0.01
1986-1999	5.72	2.10	2.37	2.72	2.41	0.29
1987-2000	7.23	3.12	2.11	2.32	3.42	0.91
1988-2001	6.66	2.57	1.96	2.59	3.40	0.74
1989-2002	6.28	2.48	2.07	2.53	3.03	0.40

<b>Chile</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	8.19	3.94	5.18	2.08	1.58	1.33
1978-1991	8.23	4.09	5.12	2.01	1.61	1.08
1979-1992	8.43	4.82	5.47	1.75	1.54	0.61
1980-1993	7.67	4.43	5.35	1.73	1.43	0.90
1981-1994	7.49	4.25	5.17	1.76	1.45	0.94
1982-1995	8.91	4.92	5.59	1.81	1.59	0.64
1983-1996	9.41	7.19	6.86	1.31	1.37	0.15
1984-1997	10.04	5.34	7.66	1.88	1.31	1.02
1985-1998	9.98	6.05	7.37	1.65	1.35	0.60
1986-1999	9.97	4.04	6.78	2.47	1.47	1.89*
1987-2000	9.79	3.75	6.69	2.61	1.46	1.80*
1988-2001	10.00	3.92	6.42	2.55	1.56	1.84*
1989-2002	9.58	3.79	6.05	2.53	1.58	1.76*

(Table 6 continued)

<b>Costa Rica</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	6.08	2.60	3.28	2.34	1.85	1.11
1978-1991	6.09	2.78	2.80	2.19	2.17	0.03
1979-1992	6.60	2.82	3.01	2.34	2.19	0.34
1980-1993	6.94	2.95	3.19	2.35	2.18	0.44
1981-1994	7.52	3.36	3.47	2.24	2.17	0.18
1982-1995	7.52	3.28	3.91	2.29	1.92	0.96
1983-1996	8.35	4.80	4.50	1.74	1.86	0.20
1984-1997	9.06	5.33	4.69	1.70	1.93	0.32
1985-1998	10.16	3.91	4.72	2.60	2.15	0.62
1986-1999	11.97	6.37	5.25	1.88	2.28	0.45
1987-2000	11.69	5.65	4.98	2.07	2.35	0.34
1988-2001	9.53	4.35	4.72	2.19	2.02	0.26
1989-2002	9.38	4.42	4.69	2.12	2.00	0.18

<b>Ecuador</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	5.50	-183.17	2.84	-0.03	1.93	2.28*
1978-1991	7.00	17.50	3.05	0.40	2.30	2.33*
1979-1992	7.24	17.67	2.67	0.41	2.72	2.66*
1980-1993	6.42	22.15	2.32	0.29	2.77	2.82*
1981-1994	7.22	16.78	2.33	0.43	3.09	2.86*
1982-1995	7.89	17.15	2.22	0.46	3.56	3.32*
1983-1996	8.27	15.60	2.43	0.53	3.40	2.80*
1984-1997	9.01	-12.86	2.90	-0.70	3.10	4.08*
1985-1998	7.91	-12.36	2.78	-0.64	2.85	3.87*
1986-1999	7.53	5.06	2.12	1.49	3.55	2.25*
1987-2000	6.26	3.84	2.03	1.63	3.08	1.51*
1988-2001	7.12	3.21	2.55	2.22	2.79	0.60
1989-2002	5.27	1.39	2.19	3.80	2.40	2.03*

<b>Dom. Rep.</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	10.52	17.24	3.14	0.61	3.35	1.31
1978-1991	8.74	8.09	2.85	1.08	3.06	0.92
1979-1992	10.05	9.67	3.27	1.04	3.07	1.02
1980-1993	9.92	9.63	3.17	1.03	3.13	1.05
1981-1994	9.70	14.06	3.03	0.69	3.20	1.25
1982-1995	8.97	13.00	3.09	0.69	2.90	1.13
1983-1996	11.57	28.23	3.50	0.41	3.31	1.61*
1984-1997	11.99	28.54	3.76	0.42	3.19	1.63*
1985-1998	5.42	2.73	4.26	1.98	1.27	1.22
1986-1999	5.90	3.26	4.74	1.81	1.24	0.92
1987-2000	7.16	4.07	5.01	1.76	1.43	0.56
1988-2001	5.49	3.29	4.50	1.67	1.22	0.74
1989-2002	4.14	2.21	4.64	1.87	0.89	1.71*

<b>El Salvador</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	-0.06	-0.02	-0.48	2.57	0.12	4.29*
1978-1991	0.70	0.31	-0.71	2.26	-0.99	5.68*
1979-1992	-0.21	-0.09	-0.55	2.41	0.38	3.91*
1980-1993	-0.40	-0.16	0.27	2.44	-1.46	7.88*
1981-1994	1.45	0.59	1.55	2.44	0.94	2.54*
1982-1995	3.84	1.14	2.75	3.36	1.40	2.78*
1983-1996	5.56	1.54	3.32	3.62	1.67	1.86*
1984-1997	5.53	1.43	3.52	3.88	1.57	2.33*
1985-1998	6.97	1.77	3.69	3.93	1.89	1.94*
1986-1999	7.85	1.88	3.89	4.18	2.02	1.84*
1987-2000	9.98	3.26	4.03	3.06	2.48	0.55
1988-2001	9.08	2.88	3.97	3.15	2.29	0.85
1989-2002	10.14	2.93	3.99	3.46	2.54	0.87

(Table 6 continued)

<b>Guatemala</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	0.85	0.27	2.17	3.15	0.39	2.11*
1978-1991	-0.24	-0.07	1.87	3.49	-0.13	2.44*
1979-1992	0.44	0.10	1.86	4.51	0.23	2.53*
1980-1993	0.20	0.04	1.80	5.02	0.11	3.09*
1981-1994	0.07	0.01	1.82	5.29	0.04	3.60*
1982-1995	1.99	0.40	2.13	5.02	0.94	2.82*
1983-1996	3.22	0.62	2.59	5.23	1.24	2.18*
1984-1997	4.57	0.77	3.09	5.91	1.48	1.81*
1985-1998	4.98	0.66	3.41	7.57	1.46	2.46*
1986-1999	5.08	0.33	3.73	15.32	1.36	3.21*
1987-2000	6.35	0.42	3.98	15.26	1.60	2.30*
1988-2001	5.67	0.61	3.89	9.34	1.46	2.31*
1989-2002	5.04	0.65	3.77	7.73	1.34	2.16*

<b>Mexico</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	11.57	3.67	3.57	3.15	3.24	0.09
1978-1991	10.63	3.45	3.63	3.08	2.93	0.20
1979-1992	9.36	2.85	3.25	3.29	2.88	0.51
1980-1993	8.61	2.45	2.70	3.52	3.19	0.37
1981-1994	8.29	2.18	2.36	3.80	3.52	0.26
1982-1995	9.64	2.34	1.29	4.11	7.48	3.56*
1983-1996	9.33	2.36	1.70	3.96	5.48	1.80*
1984-1997	9.08	3.34	2.49	2.72	3.65	1.41*
1985-1998	9.53	3.57	2.59	2.67	3.68	1.56*
1986-1999	10.74	4.05	2.66	2.65	4.04	2.10*
1987-2000	11.59	4.39	3.40	2.64	3.41	1.07
1988-2001	10.65	3.82	3.24	2.79	3.29	0.70
1989-2002	10.34	3.13	3.22	3.30	3.22	0.27

<b>Honduras</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	2.92	1.48	3.59	1.97	0.81	1.74*
1978-1991	2.79	1.52	3.08	1.83	0.91	1.17
1979-1992	1.89	0.93	2.77	2.03	0.68	1.36*
1980-1993	0.64	0.31	2.88	2.03	0.22	1.94*
1981-1994	0.30	0.16	2.74	1.83	0.11	1.92*
1982-1995	1.06	0.60	2.85	1.78	0.37	1.76*
1983-1996	2.37	4.55	3.20	0.52	0.74	0.44
1984-1997	2.41	6.69	3.63	0.36	0.66	0.46
1985-1998	2.55	15.95	3.52	0.16	0.72	1.25
1986-1999	1.22	9.36	3.09	0.13	0.39	0.78
1987-2000	1.61	9.49	3.45	0.17	0.47	0.87
1988-2001	1.81	7.22	3.20	0.25	0.56	0.91
1989-2002	2.02	9.62	3.06	0.21	0.66	1.36*

<b>Nicaragua</b>	x	y <sub>b</sub>	y	π	π*	t
1977-1990	-0.64	-0.47	-2.41	1.38	0.27	1.22
1978-1991	-1.53	-1.28	-3.02	1.19	0.50	0.71
1979-1992	-0.73	-0.69	-2.44	1.06	0.30	0.80
1980-1993	-1.44	-1.14	-0.57	1.27	2.51	0.69
1981-1994	0.97	96.64	-0.67	0.01	-1.45	1.22
1982-1995	0.92	2.18	-0.74	0.42	-1.24	1.34
1983-1996	1.98	3.54	-0.34	0.56	-5.81	6.31*
1984-1997	2.93	4.30	-0.31	0.68	-9.58	10.09*
1985-1998	4.91	7.56	0.10	0.65	50.83	51.24*
1986-1999	6.35	9.48	0.91	0.67	6.95	6.71*
1987-2000	6.23	-13.26	1.90	-0.47	3.28	4.34*
1988-2001	7.01	-15.93	2.17	-0.44	3.24	4.13*
1989-2002	6.85	76.09	3.13	0.09	2.19	1.59*

(Table 6 continued)

<b>Paraguay</b>	x	y <sub>b</sub>	y	$\pi$	$\pi^*$	t
1977-1990	14.93	7.78	5.49	1.92	2.72	0.54
1978-1991	13.70	8.25	4.89	1.66	2.80	0.75
1979-1992	11.97	6.20	4.21	1.93	2.85	0.58
1980-1993	9.21	3.60	3.69	2.56	2.50	0.04
1981-1994	12.52	4.80	2.85	2.61	4.39	0.72
1982-1995	13.54	3.15	2.58	4.30	5.25	0.36
1983-1996	12.05	2.92	2.93	4.13	4.10	0.01
1984-1997	10.08	-7.05	3.34	-1.43	3.02	1.07
1985-1998	10.50	7.14	3.09	1.47	3.40	0.65
1986-1999	8.54	2.68	2.84	3.19	3.01	0.04
1987-2000	3.82	0.79	2.81	4.83	1.36	1.29
1988-2001	3.46	0.79	2.70	4.39	1.28	1.20
1989-2002	0.06	0.01	2.08	4.86	0.03	2.09*

<b>Uruguay</b>	x	y <sub>b</sub>	y	$\pi$	$\pi^*$	t
1977-1990	4.89	2.42	1.46	2.02	3.36	2.44*
1978-1991	4.58	2.27	1.61	2.02	2.85	1.40*
1979-1992	4.92	2.15	1.79	2.29	2.75	0.79
1980-1993	5.07	2.40	1.54	2.11	3.30	1.97*
1981-1994	5.89	2.80	1.64	2.10	3.59	2.71*
1982-1995	5.32	2.46	1.42	2.16	3.73	3.12*
1983-1996	6.80	2.65	2.52	2.57	2.70	0.21
1984-1997	6.63	2.64	3.61	2.51	1.83	1.98*
1985-1998	6.77	2.82	4.02	2.40	1.68	2.18*
1986-1999	5.81	2.58	3.71	2.25	1.57	2.17*
1987-2000	5.44	2.62	2.98	2.08	1.83	0.74
1988-2001	5.42	2.48	2.17	2.19	2.50	0.93
1989-2002	4.14	1.91	1.29	2.17	3.20	3.06*

<b>Peru</b>	x	y <sub>b</sub>	y	$\pi$	$\pi^*$	t
1977-1990	2.96	2.07	0.34	1.43	8.64	14.98*
1978-1991	2.45	1.70	0.47	1.44	5.22	7.75*
1979-1992	1.84	1.24	0.42	1.48	4.39	6.42*
1980-1993	0.55	0.40	0.34	1.39	1.60	0.48
1981-1994	2.84	1.96	1.04	1.45	2.73	3.19*
1982-1995	3.17	2.07	1.14	1.53	2.78	3.05*
1983-1996	3.05	2.00	1.36	1.52	2.24	1.74*
1984-1997	4.75	3.30	2.69	1.44	1.76	0.71
1985-1998	4.65	3.08	2.28	1.51	2.04	1.41*
1986-1999	4.84	3.10	2.14	1.56	2.26	1.73*
1987-2000	6.09	3.85	1.63	1.58	3.74	4.99*
1988-2001	7.14	4.06	1.07	1.76	6.65	10.73*
1989-2002	8.35	4.82	2.04	1.73	4.09	4.34*

<b>Venezuela</b>	x	y <sub>b</sub>	y	$\pi$	$\pi^*$	t
1977-1990	0.65	0.21	1.01	3.17	0.64	1.73*
1978-1991	1.40	0.39	1.26	3.60	1.11	1.79*
1979-1992	1.62	0.43	1.53	3.74	1.06	1.97*
1980-1993	1.90	0.52	1.49	3.68	1.28	1.84*
1981-1994	3.65	0.85	1.64	4.27	2.23	1.55*
1982-1995	4.50	1.01	1.95	4.47	2.31	1.61*
1983-1996	5.72	1.11	2.08	5.14	2.75	1.91*
1984-1997	6.62	1.48	2.81	4.47	2.36	1.59*
1985-1998	5.78	1.74	2.72	3.32	2.13	1.36*
1986-1999	5.30	1.69	2.27	3.14	2.34	1.07
1987-2000	4.82	1.39	2.03	3.47	2.37	1.65*
1988-2001	4.85	1.56	1.98	3.11	2.45	0.92
1989-2002	4.01	1.37	0.93	2.93	4.33	1.90*

Note: <sup>1</sup> An asterisk (\*) denotes that  $\pi$  differs significantly from  $\pi^*$  at the 95 per cent confidence level (i.e. the McCombie test fails).