

Is Pakistan's Growth Rate Balance-of-Payments Constrained? Policies and Implications for Development and Growth

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ABSTRACT *This paper examines the extent to which Pakistan's growth has been, or is likely to be, constrained by its balance of payments. Evidence presented suggests that Pakistan's maximum growth rate consistent with equilibrium on the basic balance is approximately 5% per annum. This is below the long-term target GDP growth rate of 7–8% per annum. This balance-of-payments constrained growth approach provides some important implications for Pakistan's development policy. Real exchange rate depreciations will not lead to an improvement in the current account. Pakistan must lift the constraints that impede higher growth in exports. In particular, it must shift its export structure towards more sophisticated products with a higher income elasticity of demand.*

1. Introduction

Pakistan's output growth rate since the 1960s has averaged 5.3% per annum, and 2.5% in terms of productivity growth. In the 1950s and 1960s Pakistan started transforming from a poor agricultural economy into a rapidly industrializing one; yet it never subsequently achieved sustained growth rates similar to those of the Asian Tigers or, more recently, China. The country's Poverty Reduction Strategy (Ministry of Finance, 2007) has targeted a GDP growth rate of 7–7.5% per annum for the next decade. The question that naturally arises is whether this is feasible, or whether it is an over-optimistic target. If the former, what are the necessary policy measures that should be taken to ensure this outcome? If the latter, what impedes higher growth?

A major problem of Pakistan's economy is its recurring crises in the current account of the balance of payments. When Pakistan's output growth rate increases, and this is not due to a rise in the growth of its exports, the result is a balance-of-payments crisis. Indeed, recent developments in Pakistan's economic conditions suggest that the main limitation is likely to come from an under-performance in the growth of exports and the consequent balance-of-payments problems (Felipe & Lim, 2008). In particular, there are concerns about the changing composition of output and the rise in substantial deficits in the current and fiscal accounts. In fiscal year 2007–08, the current account deficit rose to 8.4%

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of GDP. This has led to a serious balance-of-payments crisis. As a consequence, the rating agencies Standard and Poor's and Moody's downgraded Pakistan. This has had serious consequences for overseas borrowing.¹

The current account deficits in the past, as now, have been partly financed by short-term international borrowing, which is highly volatile and brings with it the real danger of capital flight and a collapse in the exchange rate. In previous years, net positive capital inflows have prevented a balance-of-payments crisis.² As Felipe & Lim (2008, p. 8) pointed out, a balance-of-payments deficit is not necessarily a bad thing. If the capital flows are used for productive investment, this need not be a cause for concern. In particular, if the funds are used to improve export performance and enhance the competitiveness of import-competing industries, then this may be sufficient to generate a subsequent improvement in the current account.

This is not the case, however, with Pakistan at present. As Felipe & Lim (2008, p. 8) put it: "in the case of Pakistan, the current deficit reflects low export growth ... and, ultimately export competitiveness problems. Pakistan's persistent current account deficit does not reflect a highly productive economy". The heart of the present problem lies in the collapse of the growth of exports, which does not bode well for future growth. Since the 1960s, Pakistan's export performance has been clearly substandard, with only Afghanistan, the Kyrgyz Republic, Mongolia, Sri Lanka, Turkmenistan and Uzbekistan having lower export growth rates. There is an urgent need for a radical restructuring of the economy, so that exports do not depend so heavily on textiles; and towards the production and export of manufactured goods with a higher income elasticity of demand.³

In November 2008 the problem had become so serious that Pakistan had to enter into an IMF programme and borrow US\$7.6 billion to avoid defaulting on its sovereign debt. Over the period March–November 2008, the rupee had depreciated by 20%. As a loan condition, the Fund frequently asks countries for fiscal rectitude (i.e. a lower budget deficit with a rapid move to a balanced budget). This inevitably results in a return to a slower rate of growth. In order to avoid such recurrent balance-of-payments crises, it is necessary for the growth rate be kept permanently below the growth in productive potential.

Similarly, the *Pakistan Economic Survey 2007–08* (p. xvii) recommends that the top priority of the government should be "correction of imbalances through shaving off aggregate demand by appropriate policies". In other words, in spite of the high unemployment and the damage this would do to investment, the remedy advocated for the balance-of-payments problem is to curtail economic growth. This would certainly solve the problem, as slower growth in output would reduce the rate of increase of imports, whereas growth in exports is largely determined by growth in world markets and is hence unaffected by the reduction in domestic growth. In this sense, Pakistan is heading towards, or is actually experiencing, a balance-of-payments constraint on its growth rate. However, the solution is not to reduce aggregate demand but to introduce policies that will increase the growth in exports and thereby obviate the balance-of-payments constraint.

The rest of the paper is structured as follows. In Section 2, the balance-of-payments constrained growth model is outlined and its implications discussed. In Section 3, the empirical results are presented and the extent to which Pakistan's growth rate is balance-of-payments constrained is discussed. Section 4 discusses the implications for Pakistan's development policy.

2. The Balance-of-Payments Constrained Growth Model

The basic premise of the balance-of-payments constrained growth model is that, in the long run, no country can grow faster than the rate that is consistent with balance on the current account, unless it can finance ever-growing deficits. Indeed, if imports grow faster than exports, the current account deficit has to be financed by borrowing from abroad, often to a large extent by growth in short-term capital inflows; but this cannot continue indefinitely. The seminal paper is Thirlwall (1979).

The reason this is not sustainable is straightforward. If the growth in net inward financial flows is greater than the growth in GDP, then the net overseas debt-to-GDP ratio will inevitably rise. There is a limit to the size this ratio can reach before international financial markets become nervous about the risk of private and, especially in less-developed countries, public default.⁴ If much of the borrowing is short term there is a danger of capital flight, precipitating a collapse of the exchange rate. Not only will this cause capital losses in terms of foreign currency (notably US dollars) of domestic assets owned by foreigners (the lenders), but it will also cause severe domestic liquidity problems. This is especially true of many developing countries, as overseas borrowing by banks and firms is predominantly denominated in a foreign currency, normally US dollars.⁵ As the exchange rate plummets, it becomes increasingly difficult for domestic firms to access domestic funds to finance their debt and day-to-day operations, often with disastrous consequences.

The exact size of the net overseas debt-to-GDP ratio at which it becomes difficult for a country to borrow in the world markets will vary from country to country, depending on the strength of its underlying economy and the perceived danger of government default. The USA, for example, can run a much larger deficit as a proportion of its GDP than most less-developed countries, but there are limits even to the size of the US current account deficit.

Consequently, there is a growth rate that a country cannot exceed for any length of time, because if it does so it will quickly run into balance-of-payments difficulties. This is the "balance-of-payments equilibrium growth rate". Simply put, an increase in a country's growth rate through domestic demand management policies, *ceteris paribus*, increases the growth in imports through the import demand function, while export growth, determined largely by growth in the country's overseas markets, remains unaffected.⁶ Thus, the only effective way to reduce a growing current account deficit quickly is to reduce the rate of GDP growth. A country is said to be "balance-of-payments constrained" if its actual growth rate (y_A) is such that the current account is in balance in the long run and y_A is below the growth in productive potential (y_P). This growth rate is termed the balance-of-payment equilibrium growth rate (y_{BP}).⁷

The approach assumes that there are underutilized resources that can be brought into production if there is a *sustained* increase in the growth in demand (in the short run, there may be supply bottlenecks that can put a brake on growth). There is either disguised unemployment or a substantial traditional sector where productivity is below that in the modern sector. In the latter case, a faster growth rate will lead to a more rapid transfer of labour from the traditional to the modern sector, and hence induce productivity gains.

To derive the balance-of-payments equilibrium growth rate (see Thirlwall & Nureldin Hussain, 1982), it is convenient to start with the definition of the balance of payments, namely:

$$P_X X + R + F = P_M M, \quad (1)$$

where: $P_X X$ is the value of exports measured in nominal domestic currency (P_X is the domestic price of exports, expressed in nominal domestic currency); R is the net flow of remittances from overseas workers measured in domestic currency; F is the value of the remaining net capital inflows (including the net change in foreign exchange reserves) in domestic currency; and $P_M M$ is the value of imports in domestic currency (P_M is the foreign price of imports, expressed in domestic currency).

The demands for exports and imports are given, respectively, by the functions:

$$X = AZ^\varepsilon (REER)^\psi \quad (2)$$

and

$$M = BY^\pi (1/REER)^\eta \quad (3)$$

where Z is world income,⁸ ε is the world income elasticity of demand for the country's exports, $\psi (< 0)$ is the price elasticity of demand for exports, Y is domestic income, π is the domestic income elasticity of demand for imports and $\eta (< 0)$ is the price elasticity of demand for imports. A and B are constants. $REER$ is the real effective exchange rate and equals the ratio of domestic-to-foreign prices (i.e. P_d/P_f), expressed in a common currency.⁹ In a growing economy, balance-of-payments equilibrium requires that the growth of exports plus net total capital flows equals that of imports.

Expressing equations (1)–(3) in growth rates and substituting the export and import demand functions into the balance-of-payments equation gives the following equation for the growth of output (lower case letters denote growth rates):

$$y = \frac{\theta_H \varepsilon Z + (\theta_X \psi + \eta)(reer) + \theta_R(r - p_x) + \theta_F(f - p_x) + (p_X - p_M)}{\pi} \quad (4)$$

where θ_X , θ_R and θ_F are the share of exports, overseas remittances and capital flows in total foreign earnings, i.e. $\theta_X = (P_X X)/(P_X X + R + F)$, $\theta_R = R/(P_X X + R + F)$ and $\theta_F = F/(P_X X + R + F)$, respectively, and $\theta_X + \theta_R + \theta_F = 1$. As capital flows tend to be volatile, the balance-of-payments constrained growth rate is the growth rate that can be achieved in the absence of capital flows, i.e. $\theta_F = 0$:

$$y_{BP} = \frac{\theta_X \varepsilon Z + (\theta_X \psi + \eta)(reer) + \theta_R(r - p_x) + (p_X - p_M)}{\pi} \quad (5)$$

If the real effective exchange rate and the relative export and import prices grow at the same rate (i.e. $reer = p_X - p_M$), and in the absence of remittances, that is, $\theta_R = 0$ (or if $r = p_x$), then equation (5) becomes:

$$y_{BP} = \frac{\varepsilon Z + (1 + \psi + \eta)(reer)}{\pi} \quad (6)$$

If either the Marshall-Lerner condition just holds (i.e. $|\psi + \eta| = 1$) or changes in the real effective exchange rate have no long-term effect on the growth of exports or imports, or both, equation (6) becomes:

$$y_{BP} = \frac{\varepsilon Z}{\pi} \quad (7)$$

which is one version of what is known as Thirlwall's law.

If the growth of the real effective exchange rate has no effect on the growth of exports (either because the rate of change of the real effective exchange rate is negligible or because $\psi = 0$), then equation (4) becomes:

$$y = \frac{\theta_X x + \eta(reer) + \theta_R(r - p_X) + \theta_F(f - p_X) + (p_X - p_M)}{\pi}, \quad (8)$$

where $x = \varepsilon z$ from equation (2); and equation (5), the balance-of-payments equilibrium growth rate, becomes:

$$y_{BP} = \frac{\theta_X x + \eta(reer) + \theta_R(r - p_X) + (p_X - p_M)}{\pi}; \quad (9)$$

and if the real exchange rate has no effect on the growth of imports, equation (9) reduces to:

$$y_{BP} = \frac{\theta_X x + \theta_R(r - p_X) + (p_X - p_M)}{\pi}. \quad (10)$$

Finally, if there is no change in the terms of trade (i.e. $p_X - p_M = 0$) and in the absence of remittances (i.e. $\theta_R = 0$), then equation (9) becomes:

$$y_{BP} = \frac{x}{\pi}, \quad (11)$$

which is the second version of Thirlwall's law.

The consequences of having balance-of-payments problems are straightforward. If a country encounters a balance-of-payments problem before short-term capacity utilization is reached, then demand will be curtailed. Disguised and open unemployment will increase and capital accumulation will decline (together with a reduction in embodied and induced technical progress). This will lead, in the long run, to a relative deterioration in the country's export potential compared with that of its main competitors. The likely result is a vicious circle, with further balance-of-payments problems. By contrast, fast export growth will facilitate the import of necessary capital goods, encourage a high rate of investment, and foster rapid structural change with labour moving from low to high productivity sectors.

In this model, emphasis is placed on the growth in exports, not just because they enable the scale of production of export-oriented industries to be larger, but also because exports are the only component of demand whose growth relaxes the balance-of-payments constraint. The approach is sometimes termed "demand-oriented". This is because when y_{BP} is below y_p an increase in the growth of exports will increase the growth of output via the dynamic Harrod foreign trade multiplier, or more generally, the Hicks super-multiplier (McCombie & Thirlwall, 1994). However, this is not to say that the supply side is unimportant. Indeed, the approach emphasizes the importance of increasing the rate of growth of exports, which will inevitably involve supply-side measures.

Given the assumption (and empirical evidence) that the change in relative prices has little effect on the growth of exports and imports (i.e. $\psi \cong 0$ and $\eta \cong 0$), it is important to put forward a number of caveats. The first is not to confuse this argument with the neoclassical "law of one price". This states that arbitrage ensures that the price of traded goods will be equalized in the long run. A necessary postulate that underlies the law of one price is that the goods must be homogeneous, which, together with the small country

assumption, implies that the price elasticities of exports are infinite. Hence, there can be no balance-of-payments constraint, as small relative price changes will be sufficient to bring the current account into equilibrium. The law of one price is one of the most widely empirically refuted propositions in economics. For example, Rogoff (1996, p. 647) argued that the long run has to be defined as 75 years or longer.

Second, it is important not to overstate the argument and, as we shall see, exchange rate changes in Pakistan do have some effect on the current account. Nevertheless, the existing literature indicates that there does not seem to be any strong evidence that Pakistan's prices are affected by exchange rate changes (see Haque & Montiel, 1992; Siddiqui & Akhtar, 1999; Choudhri & Khan, 2002). A sharp deterioration in the exchange rate may, after J-curve effects have worked themselves out, improve the current account for any *given* growth of output, but it will not increase the growth rate *per se*. For example, Aftab & Aurangzeb (2002) and Rehman & Afzal (2003) found J-curve effects. Furthermore, there is evidence that for many developing countries, exchange rate depreciations are actually contractionary (e.g. in the case of Pakistan, at times the depreciation of the rupee has led to substantial imported inflation) and a floating exchange rate, far from relaxing the balance-of-payments constraint, could actually be destabilizing (see Diaz Alejandro, 1963; Cooper, 1971; Krugman & Taylor, 1978; Edwards, 1989; Kamin & Rogers, 2000).

There have been a number of studies for Pakistan exploring the possibility that currency devaluation will improve the trade balance (a level adjustment) rather than leading to a sustained rise in the growth rates of imports and exports. Most of these have focused on the values of the price elasticities and on whether or not the Marshall-Lerner condition is satisfied (i.e. whether $(|\eta + \psi| > 1)$); but it must be emphasized that even if the Marshall-Lerner condition were satisfied, it would still require a *continuous* real depreciation of the exchange rate to influence the *sustained growth* of exports and imports. Moreover, if the absolute values of the price elasticities are low, the size of the continuous devaluation would have to be large to have any significant effect.

An early study by Khan (1994) using quarterly data found a "modified version of a Marshall-Lerner condition barely satisfied for Pakistan, suggesting little or no positive effect on the external balance due to devaluation. This finding is reinforced by disaggregate export demand functions". Khan & Aftab (1995) concluded that the Marshall-Lerner condition was not satisfied and at the disaggregated level a depreciation did not improve export performance. Afzal (2001) used a simultaneous equation framework over the period 1960–99, which included import supply and demand functions, and found that the coefficients of the relative price terms in both equations were small and statistically insignificant. Rehman (2007) estimated an import demand function using annual data for the period 1975–2005. He found that the absolute values of the price elasticities were small and statistically insignificant. The long-run coefficient of the import price term was -0.50, statistically significant, and that of the domestic price level -0.36, statistically insignificant. Akhtar & Malik (2000) found that the effect differed depending on who the trading partners were. A real devaluation improved the trade balance vis-à-vis the UK and Japan but not vis-à-vis the USA and Germany. Aftab & Aurangzeb (2002), however, found higher absolute values for the price elasticities. The long-run maximum likelihood estimate of the relative price (ratio of import prices to domestic prices) in the import demand function was -0.87, statistically significant. And the maximum likelihood estimate of the relative price in the export demand function was -0.62 (ratio of domestic

export prices to the trade-weighted price of exports of the major trading partners), also statistically significant. This indicates that the Marshall-Lerner condition was satisfied.

The picture that emerges is one in which the absolute values of price elasticities are generally low, regardless of whether or not the Marshall-Lerner condition is met. As Sakib (2000) points out, while Pakistan's main exports have increased in both volume and value, this increase has been very small compared with the fall in the value of the rupee. Zaidi (2005, p. 181, original emphasis) concludes that "it seems that the costs associated with a depreciation of the rupee are *significant* while the benefits are *uncertain*." In the next section we present some new evidence on this issue.¹⁰

3. Is Pakistan's Growth Rate Balance-of-Payments Constrained?

In this section, we test whether or not Pakistan's growth rate can be considered to be balance-of-payments constrained over the period 1980–2007. Since this model was first proposed by Thirlwall (1979), there have been many studies that have tested it. Generally, the results have provided compelling evidence in favour of the hypothesis that many countries' growth rates are balance-of-payments constrained (see McCombie & Thirlwall, 1994, 1997, 2004).

Clearly, however, not all countries can be simultaneously balance-of-payments constrained. In some countries, the growth of productive potential is below the balance-of-payments equilibrium growth rate. This was, for example, the case in Japan after World War II, when it ran substantial current account surpluses. The reason is that the country grew so fast that it encountered capacity constraints. Countries in this position are termed *resource constrained*. Some countries, on the other hand, are constrained to grow below their balance-of-payments equilibrium growth rate in order to reduce the rate of inflation. These countries are *policy constrained* (McCombie, 1993).

Many of the tests of the balance-of-payments constrained growth mode involve estimating the import and export demand functions and then calculating the hypothetical balance-of-payments equilibrium growth as $y_{BP} = x/\pi$ (equation (11)). If a country is at, or near, its balance-of-payments equilibrium growth rate, then y_{BP} should be a good predictor of the actual growth rate y_A (when both growth rates are calculated over, for example, 10 years). This is referred to as the "weak test". The "strong test" uses the equation for balance-of-payments constrained growth in the form $y_{BP} = \varepsilon z/\pi$ (equation (7)).¹¹ The analysis of Pakistan requires that we incorporate unrequited remittances from workers overseas as these are an important source of foreign exchange.

3.1 The Demand for Pakistan's Imports and the Weak Test of Thirlwall's Law

The first test that we discuss involves estimating the standard import demand function given by equation (3), $M = BY^\pi(1/REER)^\eta$. Regression analysis was used to obtain an estimate of π , which was then used to calculate the weak form of Thirlwall's law by using the growth of exports. The balance-of-payments equilibrium growth rate is then compared with the actual growth rate. A more formal test, first proposed by McCombie (1989), is to calculate the hypothetical income elasticity of demand (π_h) that exactly equates the balance-of-payments equilibrium growth rate with the actual growth rate and to test whether π_h is statistically different from π .

As indicated above, for the purposes of estimating equation (3), we proxy the relative price term by the real effective exchange rate.¹² It should be noted that Khan (1994) makes a plausible case for using real effective exchange rates.¹³

Recent developments in time-series econometrics have raised the problem of non-stationarity of the variables and spurious regressions. Empirically, the variables in the export and import equations are often found to be $I(1)$. Bairam (1993) found that using first differences for a sample of advanced countries did not lead to any significant differences in the estimates (compared with the estimates in logarithm form). Subsequent analyses using more appropriate and recent econometric techniques have generally found that the variables in the import and export demand equations are cointegrated (see the empirical studies in McCombie & Thirlwall, 2004).

We use the autoregressive distributed lag (ARDL) modelling approach to cointegration analysis to estimate both import and export demand functions. Although there are other approaches to estimating cointegrating relationships, such as those of Engle & Granger (1987) and Johansen (1991), all these testing procedures require that the underlying variables be integrated in the same degree. The ARDL method avoids the pre-testing issues associated with standard cointegration analyses and the classification of variables into $I(1)$ or $I(0)$.

The ARDL framework allows us to test for the presence of a long-run relationship among the variables under investigation by employing the F -statistic. Pesaran *et al.* (2001) provide the asymptotic critical values of the bounds for the F -test to be used for cointegration analysis under various assumptions. Empirically, we started with a sufficiently general model in log levels that included five lags of all variables. This was written in growth rate form following Bårdsen's (1989) parameterization and it was estimated using OLS. Then we tested the statistical significance of the short-run dynamics (i.e. the growth rate terms) following the general-to-specific methodology. The selected ARDL model for aggregate imports is as follows:

$$\begin{aligned} \Delta \ln M = & \beta_0 + \varphi_1 \Delta \ln Y_{-1} + \varphi_3 \Delta \ln Y_{-3} + \sigma_3 \Delta \ln REER_{-3} + \delta_1 \ln M_{-1} \\ & + \delta_2 \ln Y_{-1} + \delta_3 \ln REER_{-1} + vdum, \end{aligned} \quad (12)$$

where M , Y and $REER$ are real imports, GDP and the real effective exchange rate, respectively. The variable dum is a dummy variable that equals one from 2001 onwards and zero otherwise. This captures the structural break corresponding to the date Pakistan became "open" according to Wacziarg & Welch (2003).

We tested the null hypothesis $\delta_1 = \delta_2 = \delta_3 = 0$ (i.e. no long-run relationship) using Pesaran *et al.*'s (2001) F -statistic. The calculated F -statistic was 5.20, above the interval of critical values (3.79–4.85) at the 95% significance level, thereby rejecting the null hypothesis of no long-run relationship between the three variables. The results of the ARDL model for Pakistan's aggregate imports are given in Table 1.

The long-run elasticities can easily be derived from the estimated ARDL model (Bårdsen, 1989). The income elasticity of imports with respect to Pakistan's GDP (π) is 0.91 (calculated as $-(\delta_2/\delta_1)$ or $-(0.79/-0.87)$) and the price elasticity (η) is -0.24 (calculated as $-(\delta_3/\delta_1)$ or $-(-0.21)/(-0.87)$). The error correction term δ_1 is significant and indicates that the speed of adjustment to steady state is high (-0.87).¹⁴

Before testing whether Pakistan's growth rate is balance-of-payments constrained, two important points arise. The first is that Pakistan has continuously run a substantial trade

Table 1. ARDL model for import demand: equation (12) dependent variable: $\Delta \ln(M)$

Coefficient	Estimate	t-Ratio
β_0	-0.58	-0.43
φ_1	1.32	1.82
φ_3	0.17	0.24
σ_3	0.11	0.52
δ_1	-0.87	-3.87
δ_2	0.79	3.15
δ_3	-0.21	-1.18
ν	0.15	3.38

Notes: No. of observations: 24. $R^2=0.55$. Wald F -statistic=5.20. Interval of critical values for cointegration: 3.79 - 4.85.

deficit over the period concerned. This has largely been offset by the large net flows of unrequited private remittances. Remittances (part of the current account) accounted for 37% of total foreign exchange receipts in 1981, and 27% in 2007, with an average over the period of 33%. A substantial proportion of these remittances came from expatriate workers. However, it is not clear that they are related to the growth either of Pakistan's domestic income or that of its major trading partners; and they are undoubtedly influenced by political factors in the form of foreign countries' willingness to have overseas workers. Table 2 shows how workers' remittances grew considerably from US\$136 million in 1973 to US\$5494 million in 2007. It can also be seen that the distribution of the countries

Table 2. Pakistan: expatriate workers' remittances by country of origin (%)

	FY 1973	FY 1980	FY 2007
Total Middle East	25.54	78.06	48.18
Abu-Dhabi	0	6.02	3.65
Bahrain	1.81	1.89	2.48
Dubai	0	4.98	11.57
Iran	0.49	0.95	0
Iraq	0.09	0	0
Kuwait	5.18	6.4	5.26
Libya	1.63	2.94	0
Qatar	1.6	3.62	3.11
Saudi Arabia	5.79	45.61	18.64
Sharjah	0	1.43	0.53
Sultanate of Oman	8.97	4.22	2.94
Germany	0.97	3.29	1.4
Norway	0.49	0.83	0.04
UK	53.04	8.85	7.83
Canada	1.56	0.42	1.59
USA	7.34	3.52	26.58
Others	11.06	5.29	13.94
Total	100	100	100
US\$ million	136	1744	5494

Note: FY is the fiscal year 1 July to 30 June.

Source: Federal Bureau of Statistics, Pakistan.

Table 3. The balance-of-payments equilibrium growth rate: growth rates and parameter values, Pakistan 1980–2007

Variable		Value
y_A	Growth of GDP	5.31% p.a.
z	Weighted growth of trading partners	3.00% p.a.
x	Growth of exports	6.45% p.a.
$r - p_X$	Growth of remittances (real)	5.79% p.a.
$p_X - p_M$	Growth of terms of trade	-2.15% p.a.
$reer$	Rate of change of real effective exchange rate	-2.48% p.a.
π	Import income elasticity	0.91
η	Import price elasticity	-0.24
ε	Export income elasticity	1.42
ψ	Export price elasticity	-0.35
θ_X	Average export share in foreign currency receipts	0.665
θ_R	Average remittance share in foreign currency receipts	0.335

Sources: International Financial Statistics database (International Monetary Fund); Pakistan Federal Bureau of Statistics; *Asian Development Outlook* (Asian Development Bank).

of origin of the remittances has also changed markedly over the last quarter of a century. We treated these earnings as exogenous for the purposes of this exercise.

The expression for the augmented balance-of-payments growth rate was given by equation (8). Table 3 reports the growth rates and the various estimated elasticities for Pakistan over the period 1980–2007. Using these data, the balance-of-payments equilibrium growth rate given by equation (8) is 5.05% per annum, marginally below Pakistan's actual average growth rate for the period, 5.31% per annum. This suggests that, over this period, Pakistan was growing at, or very near to, its balance-of-payments equilibrium growth rate. The estimates of the price elasticities show that the demand for Pakistan's exports is price inelastic.¹⁵

If the growth of the real effective exchange rate is close to the rate of change of the terms of trade (i.e. $reer \cong (p_X - p_M)$), then the constraint implies, from the Marshall-Lerner condition, that a depreciation of the exchange rate would have no beneficial effect on the balance of payments, provided that the current account is in equilibrium. This is confirmed by testing whether the hypothetical value of the income elasticity of demand for imports that would bring y_{BP} and y_A into strict equality (π_h) is statistically different from the value of the estimated elasticity (π). The value of the hypothetical elasticity is 0.88, compared with the estimated value of 0.91. The difference is not statistically significant with a t -value of 0.41.

All this serves to demonstrate just how dependent Pakistan is on the performance of the various components of the balance of payments, and even though the growth of exports (and imports) may be steady, a relatively small short-run deterioration in the growth of remittances, in the real effective exchange rate, or in the terms of trade, could plunge Pakistan into a balance-of-payments crisis.

3.2 *The Demand for Pakistan's Exports and the Strong Test of Thirlwall's Law*

The approach in Section 3.1 suffers from the shortcoming that it assumes, rather than tests, that the growth in exports is unaffected by the rate of change in relative prices. The strong test requires estimating the export demand function and using ez , as in equation (5), instead of x ,

and then testing whether y_{BP} is statistically different from the observed growth rate, y_A . As the estimates of both ε and π have associated standard errors, it is not possible to test this hypothesis as in the case of the weak test. Estimation of the export demand function followed the same method as that of the import demand function.

3.2.1 ARDL model for the export demand function. We started with a general ARDL model with five lags in log levels and through successive tests (in the estimated growth rate form) ended up with the specific export demand function:

$$\begin{aligned} \Delta \ln X = & \alpha_0 + \delta_1 \ln X_{-3} + \beta_1 \Delta \ln Z + \beta_2 \Delta \ln Z_{-1} + \beta_3 \Delta \ln Z_{-4} \\ & + \phi_1 \Delta \ln REER_{-2} + \phi_2 \Delta \ln REER_{-3} + \lambda_1 \ln X_{-1} + \lambda_2 \ln Z_{-1} \\ & + \lambda_3 \ln REER_{-1} + \gamma dum, \end{aligned} \quad (13)$$

where X and Z are the volume of exports and the level of GDP of Pakistan's trading partners, weighted by their trade shares. The variable dum is a dummy introduced to capture the structural break in the data. It takes a value of zero for 1992–99 and one otherwise.¹⁶ The coefficients δ_s , β_s and ϕ_s represent the short-term dynamics while the terms with λ_s in the second part of the equation correspond to the long-run relationship.

The calculated F -statistics corresponding to the null hypothesis $\lambda_1 = \lambda_2 = \lambda_3 = 0$ turn out to be 4.90, which is greater than the interval of critical values (3.79–4.85) under the assumption of an intercept and no trend. This leads to the rejection of the null hypothesis of no cointegration (at the 95% significance level). The results of the estimated ARDL model for exports are reported in Table 4.

On the basis of the estimated ARDL model, income and price elasticities of export demand were derived. The estimate of the export demand elasticity with respect to the trading partners' GDP (ε) turned out to be $-(\lambda_2/\lambda_1) = 1.41$, and the price elasticity (ψ) was $-(\lambda_2/\lambda_1) = -0.34$.¹⁷ This implies that Pakistan's exports are relatively sensitive to foreign countries' GDP, while they are unaffected by the real exchange rate.

Table 4. ARDL model for export demand: equation (13) dependent variable: $\Delta \ln(X)$

Coefficient	Estimate	t -Ratio
α_0	0.12	0.04
δ_1	0.13	0.48
β_1	-2.95	-0.99
β_2	-2.02	-0.60
β_3	-1.99	-0.75
ϕ_1	0.09	0.15
ϕ_2	0.76	1.16
λ_1	0.55	-3.33
λ_2	0.78	1.88
λ_3	-0.19	-0.50
γ	0.02	1.94

Notes: No. of observations: 23, $R^2 = 0.68$, Wald F -statistic = 4.90. Interval of critical values for cointegration: 3.79 – 4.85.

The sum of the price elasticities of the demand for imports and exports is -0.59 , which implies that the Marshall-Lerner condition for a successful devaluation is not satisfied.¹⁸ It is likely that the relative price terms in both the import and the export demand functions are subject to measurement errors, but it is not possible to determine a priori the direction of the bias.

The error correction term carries the correct negative sign and it is statistically significant. The coefficient shows that about 55% of the discrepancy between the actual and the equilibrium value of the log of exports is corrected within a year.

For the whole period, the balance-of-payments constrained growth rate given by equation (5) is 4.06% per annum, which is over one percentage point below the actual growth rate of 5.31% per annum. This suggests that Pakistan's actual growth was substantially above its balance-of-payments constrained growth rate, and the difference was covered by net inward capital flows. However, if the estimates of the price elasticities are both constrained to take a value of -0.5 , then the balance-of-payments constrained growth rate rises to 5.07% annum, which is only marginally below the actual growth rate. The results are not very different from those obtained using the weak form of Thirlwall's law.

3.3 The Separate Contributions of the Components of the Balance-of-Payments Growth Rate

Table 5 reports the contributions of the various components of the balance-of-payments to the actual growth of GDP. This is an *ex post* analysis because it includes the growth of total capital flows (see equations (4) and (8)).¹⁹ Consequently, we used the shares of exports (θ_X), remittances (θ_R) and capital inflows (θ_F) in total foreign earnings.

Column A reports the contributions calculated using equation (8). The growth of exports contributes nearly 88% of the growth of GDP, which is equivalent to a growth rate of GDP of 4.66% per annum (the figure in parentheses). This is perhaps not too surprising. The importance of the growth of remittances is also readily apparent. This accounts for 40% of the growth of GDP, equivalent to 2.11 percentage points. It can also be seen that the deterioration in the terms of trade imposes a heavy cost on the growth rate, reducing it by the equivalent of 2.34 percentage points, although this is partially offset by the rate of change of the real

Table 5. Contribution of the components of the *ex post* balance-of-payments growth rate to the actual growth rate: Pakistan, 1980–2007

Component	(A) equation (8) weak test	(B) equation (4) strong test
Exports: $\frac{\theta_X X}{\pi}, \frac{\theta_X EZ}{\pi}$	88% (4.66 pp)	58% (3.06 pp)
Unrequited remittances: $\frac{\theta_X(r-p_X)}{\pi}$	40% (2.11 pp)	40% (2.11 pp)
Real effective exchange rate: $\frac{\eta(reer)}{\pi}, \frac{(\eta+\theta_X\psi)(reer)}{\pi}$	12% (0.65 pp)	24% (1.26 pp)
Terms of trade: $\frac{(p_X-p_M)}{\pi}$	-44% (-2.34 pp)	-44% (-2.34 pp)
Financial flows: $\frac{\theta_F(f-p_X)}{\pi}$	5% (0.26 pp)	24% (1.25 pp)
Total:	100% (5.30)	100% (5.30)

Notes: The figures in parentheses are the contributions expressed as a percentage point growth rate (pp). Columns may not sum to the value of the totals because of rounding errors. The first expression in exports and real effective exchange rate is from equation (8), while the second one is from equation (4).

exchange rate. The growth of capital flows also raises the growth rate by about 0.26 percentage points. If the price elasticities of demand for imports (η) and exports (ψ) are once again constrained each to be -0.5 (rather than the estimated -0.24 and -0.34 , respectively), this increases the contribution the rate of change that the real effective exchange rate makes and reduces the contribution of capital flows.

Column B reports the contribution of the various components to the actual growth rate in equation (4). Once again, the contribution of the growth of capital flows has been calculated as a residual. The contribution of the growth in world income, plus that of the rate of change of the effective exchange rate, amounts to 4.32 percentage points of the growth of GDP. This compares with a contribution of 5.31 percentage points from the volume of exports and the rate of change of the real effective exchange rate in the weak form.

These results once again confirm the ineffectiveness of relative prices in generating export growth because of the low absolute value of the price elasticities. Given the difficulty in attracting substantial capital flows, these results confirm that a relatively small decline in export growth, together with a fall in remittances, is sufficient to present Pakistan with serious balance-of-payments problems.

4. Implications for Pakistan's Development Policy

Thirlwall's law suggests that the maximum sustainable rate of growth of many countries is given by the simple rule $y_{BP} = \varepsilon z / \pi$, although in the case of Pakistan this has to be augmented by the growth in overseas workers' remittances. Of course, it should be emphasized that the rule is not a theory of the determinants of growth from the supply side *per se*, but a hypothesis of what is likely to be a major impediment to growth should there be an expansion in the rate of growth unaccompanied by an improvement in export performance. Having said this, though, the implication is that any successful development strategy needs to concentrate on improving exports; specifically, increasing the ratio ε/π . In other words, the supply characteristics are important. This is because it follows from the balance-of-payments growth rule that the key parameters that determine the maximum growth of an economy, consistent with balance-of-payments equilibrium, are the income elasticity of demand for exports (ε) and the domestic income elasticity of demand for imports (π). Given scarce resources, it is the factors affecting these values on which the policy-maker should focus. Policies designed to increase ε and reduce π should also improve the supply side of the economy in general.

Regarding ε , disparities in the world income elasticity of demand for exports can arise for two reasons. The first concerns differences in non-price competitiveness. These include such factors as quality, delivery times and the effectiveness of the country's overseas distribution networks. The second reason applies to many developing countries, and it is that the composition of exports is unfavourable, in that their world income elasticities are low. This is true of many less-developed countries, whose exports tend to concentrate on primary commodities or very low-tech labour-intensive manufactured goods, such as textiles. These are generally commodities for which world demand is growing slowly or where there is fierce international competition.

Differences in the income elasticity of demand for imports (π) are the consequence of similar factors. In the case of the developing countries' imports, the values of π partly reflect the degree of dependence of the country on imported capital and intermediate goods necessary for domestic production. This elasticity can also be affected by the degree of

income inequality and, as a consequence, the demand for sophisticated and expensive consumer goods.²⁰

This discussion suggests that for a country to grow rapidly it must specialize in those commodities with a relatively high income elasticity of demand. These are commodities that, in some sense, can be deemed more “sophisticated”. Hausmann *et al.* (2007) provide empirical evidence in support of this proposition. They calculated a measure of the productivity associated with a country’s export basket (*EXPY*), which could be regarded as a measure of the sophistication or “quality” of the exported goods. To calculate this index, they first calculated the overall level of productivity associated with a particular export k ($PRODY_k$). This is the sum of the exporting countries’ income per capita weighted by the index of revealed comparative advantage of the corresponding commodity (i.e. the relative share of good k in the country’s total export basket, divided by the world share of good k in world exports). This gives a measure of the “average” world productivity of export k . To obtain the productivity level of the exports of a specific country (i.e. *EXPY*), the “average” productivity of an export k ($PRODY_k$) is multiplied by the share of that export in the country’s total exports and then all the values summed.

Intuitively, this gives a measure of the degree of sophistication of a country’s total basket of exports in terms of the productivity level of all countries producing those exports. So it is possible for a less-developed country to be exporting a basket of high productivity goods if those exports are also predominantly exported by relatively advanced countries. The converse is, of course, equally true. Exports with low productivity tend to be primary products that are produced predominantly by developing countries. Hausmann *et al.* (2007), not surprisingly, found that there is a strong correlation between a country’s level of productivity and *EXPY*, but what is more interesting is that after controlling for a number of “fundamentals” (e.g. initial per capita income, human capital levels), countries with a higher level of initial *EXPY* have faster growth rates.

Hausmann *et al.* (2007) explained these findings in terms of “cost discovery” and presented a formal model of the process. Entrepreneurs in developing countries engaged in breaking into new export markets undertake a detailed analysis of the cost structure of the possible production process. This has considerable positive externalities because, if it is successful, additional entrepreneurs can take advantage of this without having to incur all the expenses of the discovery process. Consequently, some traded goods are associated with higher productivity levels than others and countries that latch on to higher productivity goods (through cost discovery) will perform better.

This provides one micro-foundation (but not the only one) of the observed disparities in the world income elasticity of demand for a country’s exports (ϵ). It is likely that high productivity exports have higher income elasticity than low productivity exports and, hence, the former will grow more quickly than the latter. This is confirmed by the fact that countries with initially high levels of *EXPY* experience high rates of growth of exports. Hausmann *et al.* concluded that the evidence shows that, *ceteris paribus*, an economy is better off producing goods that the more advanced countries export. Standard models of comparative advantage indicate that pushing specialization up the product scale in this fashion would be bad for an economy’s health: it would simply distort production and create efficiency losses. Hausmann *et al.*’s (2007) results suggest, however, that countries that produce a set of goods that are higher on this quality spectrum tend to perform better.

Table 6 presents data on the sophistication and composition of Pakistan’s top 20 exports (which in 2006 accounted for almost 75% of the country’s total exports). What is immediately

Table 6. Pakistan's exports ranked by *PRODY* (SITC Rev2 4-digit level) and share (%) in total exports

Commodity	Sophistication product-level (<i>PRODY</i>)	Export share (%)							
		1980	1985	1990	1995	2000	2005	2006	
Medical instruments and appliances, not elsewhere specified	20 814	1.25	1.23	0.95	0.89	0.88	0.97	1.00	
Other sporting goods and fairground amusements, etc.	15 712	1.66	1.22	1.87	2.00	1.85	1.76	1.94	
Furniture for medical, surgical, dental or veterinary practice	13 534	0.01	0.00	0.09	0.07	0.31	0.91	0.98	
Cotton fabrics, woven, bleached, dyed, etc. or otherwise finished	11 214	1.44	3.46	4.11	6.02	3.61	4.78	4.48	
Leather of other bovine cattle and equine leather	10 168	0.91	2.21	2.04	1.31	0.92	1.17	1.14	
Clothing accessories, knitted or crocheted, not elsewhere specified	9429	0.14	0.23	0.36	0.73	0.90	1.65	1.95	
Fabrics, woven, less 85% of discontinuous synthetic fibres	8683	0.04	0.10	2.49	3.09	4.00	3.48	3.17	
Women's, girls', infants' underwear; textile, not knitted or crocheted; other outer garments of textile fabrics, not knitted, crocheted	8585	0.31	1.24	2.59	1.90	2.44	2.59	2.77	
Other made-up articles of textile materials, not elsewhere specified	8359	0.28	0.89	0.93	1.60	2.86	2.79	2.72	
Outerwear knitted or crocheted, not elastic or rubberized; jerseys, pullovers, slipovers, cardigans, etc.	8199	0.17	0.16	1.16	1.65	3.79	3.23	3.05	
Articles of apparel, clothing accessories of leather	8176	1.26	2.11	4.49	4.80	4.61	2.96	2.73	
Outerwear knitted or crocheted, not elastic or rubberized; other clothing accessories, non-elastic, knitted or crocheted	8119	0.06	0.28	0.96	1.63	1.70	2.18	2.17	
Linen and furnishing articles of textile, not knitted or crocheted	7345	1.93	3.66	5.45	5.94	9.30	12.63	13.38	
Undergarments, knitted or crocheted; of cotton, not elastic or rubberized	7122	1.01	1.00	2.27	4.27	3.62	3.55	3.87	
Men's and boys' underwear, textile fabrics not knitted or crocheted; trousers, breeches and the like	6798	0.03	0.28	0.64	1.25	2.75	2.96	3.15	
Copper and copper alloys, refined or not, unwrought	6556				0.01		0.60	0.95	
Cotton yarn	5728	10.74	10.32	16.91	18.91	13.21	10.14	10.53	
Carpets, carpeting and rugs, knotted	5309	14.14	4.57	3.86	1.82	2.33	1.93	1.74	
Rice, semi-milled or wholly milled	5060	6.69	8.63	4.64	5.55	5.71	5.82	6.46	
Cotton fabrics, woven, unbleached, not mercerized	4578	6.91	5.07	5.15	6.88	6.16	5.15	5.20	
Subtotal:		48.98	46.66	60.96	70.32	70.95	71.25	73.38	
Sophistication, country-level (<i>EXPY</i>)		6998	7231	7693	8268	8362	8833	8728	

Note: Authors' calculations. The units of *PRODY* and *EXPY* are in 2005 constant US dollars, PPP adjusted.

Source of the raw data: United Nations Commodity Trade Statistics Database.

apparent is that many of them are relatively unsophisticated goods.²¹ The table shows the *PRODY* values of the top export categories in 2006 (with a share of at least 1%). The information in this table is revealing. Pakistan has not been able to increase the export shares of products with relatively high sophistication (*PRODY*) in its export basket. For example, the share in exports of medical instruments and appliances, the product with the highest *PRODY* in Pakistan's export basket (with a share of at least 1%), has remained stagnant, at about 1% (even lower than the share in 1980). On the other hand, the share of linens and furnishing articles of textiles, with a much lower level of sophistication, increased from less than 2% in 1980 to over 13% in 2006. Likewise, the share of exports of men's and boy's outerwear has increased from 0.03 to 3.15% of total exports. This indicates that Pakistan is specializing at the lower end of the textile range. Indeed, using constant-market-share analysis to study the changes in export performance between 1984–85 and 1988–89 and between 1988–89 and 1992–93, Mahmood & Aktar (1996) found that the market distribution of Pakistan's exports improved over time and that exports became more competitive; but this "was offset to a large extent by the concentration of exports in the traditional commodities whose world demand is very sluggish" (Mahmood & Aktar, 1996, p. 701). This is still very much the position today.

The implication of the shift to products with a lower *PRODY* is that the income level of Pakistan's exports (*EXPY*) has shown a minimal increase, contrary to what can be seen in countries that are undergoing the kind of structural transformation that leads to faster growth (seen in economies that promote exports of more sophisticated goods, such as Indonesia, Malaysia, the Philippines or Thailand). The 1980 index (at US\$6998) was marginally lower than that in 2006 (at US\$8728), and was stagnant over the last decade.

If the balance-of-payments constraint is binding, it can be seen that one way of relaxing it is by restricting certain imports through quotas and tariffs. This will reduce the domestic income elasticity of demand for imports (π). However, the income elasticity of demand for exports (ε) and π are not independent. The introduction of tariffs may well lead to an increase in the price of essential imports necessary for exporting. Moreover, to the extent that this reduces competitive pressures on domestic firms, this could reduce their efficiency, which in turn could be detrimental to export growth. A long period of import restriction, especially without a sunset clause specifying when it will end, can lead to rent-seeking and more concern with the distribution of a given level of output than with incentives to increase output. Given the prevalence of increasing returns and information and coordination failures, the implications of our analysis is that what Pakistan needs is private–public collaboration to break into the production of more sophisticated exports.²²

Pakistan, like many other developing countries today, needs to shift rapidly into the production and export of more sophisticated goods such as machinery, chemicals, automobiles, or pharmaceuticals. This is the dilemma of development. Whether or not this happens soon will depend on whether it can quickly develop the capabilities necessary to produce and export these products successfully. The experiences of countries such as Japan, Korea or Singapore show that this is possible, provided there is a conscious effort to do so, and successful public–private collaboration.

5. Conclusions

This paper has provided estimates of Pakistan's balance-of-payments equilibrium growth rate. It has been shown that this growth rate is likely to be below Pakistan's maximum

potential growth rate. As a consequence, economic policy needs to be focused primarily on supply-side improvements that will raise the growth of, in particular, sophisticated exports. In other words, Pakistan needs to move out of its traditional export areas and shift the structure of its trade towards the export of more sophisticated manufactured goods, which have a higher income elasticity of demand. In a growth context, static comparative advantage is unlikely to be a good guide to a development strategy for the country. Furthermore, it is unlikely that trade liberalization *alone* is the optimal strategy for Pakistan. The results of this paper suggest that the country requires a strategy, guided by an analysis of the country's capabilities, that emphasizes the new niches (exports) in which Pakistan can succeed and, hence, relax the balance-of-payments constraint.

Notes

- ¹ In December 2008, both Pakistan's foreign currency long-term debt and local currency long-term debt were rated CCC+ by Standard and Poor's. In August 2009 both were upgraded to B-.
- ² In the past, Pakistan has been able to run current account deficits that have been largely covered by overseas development assistance and expatriate workers' remittances.
- ³ Even though Pakistan's exports experienced a growth of 16% per annum between 2002-03 and 2005-06, this is dwarfed by a growth in imports of 29% over the same period. Moreover, a continued devaluation of the rupee may actually reduce the incentive and impetus for structural change (i.e. the shift of production and exports towards more sophisticated products). Protecting the profit margins of producers of low-value-added goods, such as yarn and grey cloth, reduces the incentive for moving up the value-added chain (Sakib, 2000, cited by Zaidi, 2005).
- ⁴ The financial markets also carefully scrutinize the ratio of the current account deficit to GDP.
- ⁵ The Asian financial crisis of 1997 bears testimony to this, and the Argentinean and Russian crises demonstrate the possibility of government default.
- ⁶ It is worth emphasizing at this stage that this assumes that the standard adjustment mechanisms through changes in the exchange rate and the relative prices of imports and exports are, for a variety of reasons, largely ineffective at ensuring external equilibrium. This is discussed further below.
- ⁷ Some countries are able to run a current account deficit almost indefinitely as capital inflows are in the form of long-term investments that help to develop their resource base and thereby increase the rate of growth of their exports. Consequently, in these circumstances the balance-of-payments constrained growth rate is defined as that growth rate that is compatible with the "basic balance" being in equilibrium.
- ⁸ Strictly speaking, this is the country's trading partners' incomes, each weighted by its export share.
- ⁹ The real effective exchange rate is used in preference to the ratio of the prices of exports and imports because exports and imports are not close substitutes.
- ¹⁰ There are also now numerous cross-sectional studies that have found a close correlation between export and output growth (see the survey in Shirazi & Manap, 2004). This is, of course, the same relationship that the balance-of-payments constrained growth predicts, but for different reasons. Granger causality tests provide more mixed evidence, but these tests largely capture the relationship between exports and output fluctuating around the trend rate of growth. The balance-of-payments equilibrium growth rate suggests that the relationship is between faster *trend* rates of growth of exports and output. Consequently, Granger tests are unlikely to be very informative and, indeed, it is not hard to think of reasons why GDP may increase prior to an increase in exports. For example, multiplier effects will occur from the increased demand for inputs for exports before the latter are sold. Nevertheless, Shirazi & Manap (2004) found that Granger causality tests show causality from exports to output but not in the reverse direction. They concluded from this that Pakistan should follow an export-led growth strategy.
- ¹¹ The "weak test" is so-called because it is derived by using the observed growth of exports (x) directly rather than the weighted growth of the output of a country's trading partners, and assumes that changes in the real exchange rate have no effect on the growth of exports. The "strong test" uses the weighted growth of overseas markets in the form ez and takes into account the effect of the real exchange rate on export growth.

- ¹² There is a further problem in the use of the “prices” of imports (and exports). These are usually proxied by unit values of imports and exports, but there are serious measurement errors in this procedure (see e.g. the IMF discussion (2008), available at: <http://www.imf.org/external/np/sta/tegeipi>).
- ¹³ Houthakker & Magee (1969) is the seminal study of import and export demand functions. Houthakker and Magee used the ratio of the price index of imports to the domestic wholesale price index to proxy the relative price term in Thirlwall’s model. (Aftab & Aurangzeb (2002) used a similar measure in their analysis of Pakistan.) Although these indices have the advantage of being readily available, their use assumes that imports are substitutes for domestically produced goods, including non-tradables. This is implausible, especially for developing countries. Ideally, the denominator should be an index of prices of a basket of similar goods produced by other competing exporters, weighted by the country’s import shares. This assumes that the elasticity of substitution of imports and domestically produced goods is low; but the data requirements for construction of such an index are substantial.
- ¹⁴ Notwithstanding the above comment, the model was also estimated using the Johansen method of cointegration. This gave virtually identical results, with an estimate of the income elasticity of imports of -0.93 and the import price elasticity of demand of -0.26 .
- ¹⁵ The balance-of-payments equilibrium growth rate when the values of the price elasticities are each constrained to -0.5 is 5.78%. These values of the price elasticities were used instead of the econometric estimates to examine the extent to which any downward bias on the latter would have an effect on the calculation of the balance-of-payments constrained growth rate.
- ¹⁶ The reason why the dummy variable affects only these specific years is that during this period the data show a break. Exports were adversely affected by the deceleration in industrial growth due to supply bottlenecks and political instability. As a consequence, during 1992–99 exports remained below the historical average. During this period, large-scale manufacturing grew at an average rate of 4.1% per annum (11% per annum during 1981–92). Similarly, the overall industrial sector registered a growth rate of 3.8% per annum during 1992–99, compared with 9% during 1981–92. Exports of primary commodities registered meagre growth of 1.1% per annum (15.2% per annum during 1981–92). Likewise, the growth rate of other exports, including those of manufactured goods, declined significantly.
- ¹⁷ These results are close to those obtained using the Johansen method.
- ¹⁸ This is strictly true only if the growth of the real effective exchange rate is the same as the rate of change of the terms of trade. It also assumes that trade is initially balanced, which is not the case here.
- ¹⁹ These are measured as the residual after all other contributions have been included. It is not possible to measure the growth of capital flows directly because the annual values include both negative and positive values.
- ²⁰ It is important to emphasize that the balance-of-payments constrained growth model has policy elements in common with the export-led growth theory, for example the importance of increasing the growth in exports. However, there are two important differences: (1) as indicated in Section 2, the emphasis on exports in the balance-of-payments constrained growth model lies in the fact that exports are the component of demand whose growth relaxes the balance-of-payments constraint; and (2) the balance-of-payments constrained growth model emphasizes exports of products with a high income elasticity of demand.
- ²¹ For reference, we calculated the level of sophistication of the 775 commodities that appear in SITC-Rev.2 4-digit level. The product with the highest sophistication level is “furnace burners”, with an index of almost 40 000; and the product with the lowest level is “tin ores”, with an index of 955.
- ²² A word of caution is needed here. We are not advocating the use of industrial policy, understood as the selective intervention or government policy that attempts to alter the sectoral structure of production towards sectors that are expected to offer better prospects for economic growth than would occur in the absence of such intervention. What we argue is that Pakistan needs to find “new” products that can export successfully, and this can only be done through public–private collaboration with the objective of identifying missing public inputs necessary to export successfully. Although this may require government support, it is very different from a strategy of “picking winners” (Hausmann & Rodrik, 2006).

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