

6. The role of the balance of payments in economic growth

J.S.L. McCombie and M. Roberts

INTRODUCTION

Kaldor's long insistence on the importance of both static and dynamic increasing returns to scale (broadly defined to include induced technical progress) in understanding the growth process has been largely vindicated by recent developments in neoclassical 'endogenous' growth theory. This theory assumes that there are no diminishing returns to capital (see Kaldor, 1977, where he is one of the first to make this assumption). Kaldor's argument that it is equally (or even more) important to consider the role of demand, as opposed to the supply side, in economic growth has, however, been largely ignored by the orthodoxy. The purpose of this chapter is to present an interpretative survey of some of the work that has taken forward the Kaldorian view. In particular, the role of the balance of payments in limiting economic growth below the maximum potential determined by supply-side considerations is discussed. This was implicit in Kaldor's earlier writings (see Thirlwall, 1987, pp. 284-5). It was the influential paper by Thirlwall (1979) that both formalized and popularized this approach (see Thirlwall, 1997), and it was endorsed by Kaldor (1981).

Kaldor's views on the importance of the growth of demand did not originate fully developed, but evolved over the years. Nevertheless, it is possible in his writings to distinguish between two categories of demand that play different roles in the economic growth process. The first, which applies to a largely closed economy, is the role of the growth of demand emanating from the agricultural sector in determining the overall pace of economic growth. The second, in an open economy, is the crucial role that the growth of demand originating from exports plays. In both cases it is necessary, of course, for Say's law not to hold, even in the long run. In other words, as Kaldor was fond of pointing out, Ricardo was fundamentally wrong when he asserted that 'there is no amount of capital which may not be employed in a country because demand is only limited by production'.

In the first case, it is not possible to understand growth without explicitly considering the complementary roles played by the agricultural sector, which

is subject to diminishing returns and surplus labour, and the more advanced industrial sector. Kaldor (1975, 1977, 1996) demonstrated that there may not be any set of relative prices that enables markets in both sectors to clear simultaneously ensuring the full utilization of resources, and that the growth of the industrial sector may be constrained by the lack of the growth of agricultural purchasing power and (to a certain extent) vice versa.

With economic development, the relative importance of the agricultural sector in the economy clearly declines. Nevertheless, Kaldor argued that even for the advanced countries, the growth of exogenous demand is still the key to understanding relative growth performances (see Kaldor, 1981). While the less developed countries can hardly be considered to be resource-constrained, according to Kaldor, it is difficult to argue persuasively that the growth of even advanced countries is determined by the exogenously given growth of effective employment (see Cornwall, 1977). Countries differ in their growth rates because of variations in the growth of demand for their exports. That is to say, overall economic growth is ultimately constrained by the rate of growth of exports, and it is not something that can be remedied by merely pump-priming the economy in Keynesian fashion and by boosting the growth of aggregate demand. It is not investment, as Keynes argued, that is the key element of exogenous demand, but, in an open economy, the growth of demand for a country's exports. A common theme in both the closed and the open economy Kaldorian models is the importance of the role of the (dynamic) Harrod foreign trade multiplier and the Hicks super-multiplier (Harrod, 1933; Hicks, 1950).

We first consider the question as to why other forms of demand, such as investment, cease to be the key exogenous factors that determine the rate of economic growth – a question which goes back to the North–Tiebout debate of 1956.¹ The argument that changes in the exchange rate have little effect on the growth of trade flows, and that the growth of capital flows has little effect on the balance-of-payments equilibrium growth rate is then elaborated and assessed. An extension of the balance-of-payments equilibrium growth model in which growth becomes path dependent is then outlined. Finally, we consider the degree to which this approach can explain the rapid growth of the East and Southeast Asian economies. We conclude by discussing an export-led growth strategy and the fallacy of composition.

EXPORTLED GROWTH AND THE BALANCE-OF-PAYMENTS CONSTRAINT

Kaldor was by no means the first to stress the importance of the export sector as a determinant of the overall rate of economic growth. One of the earliest

was North (1955), who used it to explain the growth of the Pacific Northwest of the USA, in the process of developing one of the earliest cumulative causation models. North was also aware of the importance of the foreign trade multiplier – 'since residuary industry depends entirely on demand within the region, it has been historically dependent upon the fate of the export base'. Tiebout (1956), however, raised two potentially damaging criticisms of export-led growth models, although, as we shall see, these turn out not to be serious.

First, 'there is no reason to assume that exports are the sole, or even the most important, autonomous variable determining regional income' (Tiebout, 1956, emphasis added). From the national income accounting identity and the consumption, investment, government expenditure and import demand functions, the growth of demand may be expressed as $y^d = \alpha a + \beta x$ where α is the growth of autonomous domestic expenditure and x is the growth of exports. The coefficients α and β denote the dynamic domestic and foreign trade multipliers (McCombie, 1993). The question is 'what is so important about the growth of exports compared with any other autonomous increase in demand?'.²

Second, the theory is spatially scale-dependent, which Tiebout saw as a disconcerting feature. At one extreme, an individual is normally wholly dependent upon exporting labour services. At the other extreme, 'obviously, for the world as a whole, there are no exports' (Tiebout, 1956).

Tiebout came to the conclusion that the export-base theory may be a useful explanation of the *short-run* growth of a region; but it is not the complete story, especially in a long-term context. In particular, he notes that 'since a region must optimize the use of factors and residential outputs, a decline in export activity may even be accompanied by rising regional income'.

North's (1956) reply is not particularly convincing, merely asserting that the exogenous growth rates of categories such as investment have only a short-term effect. The most effective rebuttal to Tiebout, which North does not make, is that there is a major difference between the growth of exports and other components of autonomous demand, in that only the former automatically generates foreign earnings to pay for imports. Once this is taken into account, the growth of exports is revealed as the crucial exogenous component of demand growth (although there may be some feedback from the growth of output to that of exports. In this sense, the growth of exports is weakly exogenous). An increase in the growth rate of exports has two effects on the growth of income. First, it increases the growth rate of income through the dynamic Harrod foreign trade multiplier. Second, by relaxing the balance-of-payments constraint, it permits the growth of other 'autonomous' components of demand. That is to say, the growth of other supposedly autonomous expenditures is actually endogenous to export growth. The combination of these

effects represents a working of the Hicks 'super-multiplier' (McCombie, 1985; McCombie and Thirlwall, 1994, chapter 6). This answers not only Tiebout's first but also his second criticism. Even though the value of exports may be small in comparison to total income, the balance-of-payments constraint and the super-multiplier mean that export growth is still the determining factor of total growth. Of course, Tiebout is perfectly correct to say that, for the world as a whole, growth cannot be export-led. Likewise, all countries cannot be simultaneously balance-of-payments-constrained. However, all that is required is for one trading bloc to be 'policy-constrained' (the deliberate restriction of growth due, for example, to the fear of inflation) or 'supply-constrained' (there may be a limit to the rate at which labour can be transferred between sectors or capacity can be increased). This, through the operation of the balance-of-payments constraint, will limit the growth rates that other countries can achieve, even though domestic conditions could sustain a faster growth rate (see McCombie, 1993).

The implications of this are far-reaching, as Kaldor has noted:

This doctrine [of the foreign trade multiplier and the super-multiplier] asserts the very opposite of Say's law: the level of production will *not* be confined by the availability of capital and labour; on the contrary, the amount of capital accumulated, and the amount of labour effectively employed at any one time, will be the resultant of the growth of external demand over a long series of past periods which permitted the capital accumulation to take place that was required for enabling the amount of labour to be employed and the level of output to be reached which was (or could be) attained in the current period (Kaldor, 1977).

Following the seminal work of Thirlwall (1979), what may be termed the 'standard' balance-of-payments-constrained growth model consists of the following equations (where all variables are expressed as growth rates):³

$$\text{Export demand equation: } x = \varepsilon z + \eta(p_d - p_f - \varepsilon r) \quad [6.1]$$

$$\text{Import demand equation: } m = \pi y - \psi(p_d - p_f - \varepsilon r) \quad [6.2]$$

$$\text{Balance-of-payments identity: } \omega x + (1 - \omega)f = m + p_f + \varepsilon r - p_d \quad [6.3]$$

where x , m , y and z are the growth rates of exports, imports, domestic income and the income of the rest of the world, respectively, f is the growth of real capital flows expressed in terms of the domestic currency and εr is the growth of the nominal exchange rate ($\varepsilon r > 0$ representing a continuous appreciation of the currency). The subscripts d and f denote 'domestic' and 'foreign', respectively. The parameters ε and π are the income elasticities of demand for exports and imports, while ω is the share of exports in total foreign exchange

receipts. The parameters η (< 0) and ψ (< 0) are the price elasticities of demand for exports and imports (for ease of exposition, the own and cross-price elasticities are assumed to have the same absolute values).

One of the key differences between the Thirlwall model and the Solow neoclassical model of growth is the former's emphasis on the importance, especially in highly oligopolistic markets, of non-price competition, such as quality improvements, product innovation, etc.⁴ This is (imperfectly) captured by the differences between countries in the values of their income elasticities of demand for imports, as well as international differences in the income elasticities of demand for exports.⁵ We are not in a world where trade flows respond rapidly to small changes in relative prices. This allows the development of a simple model, which gives some illuminating insights into the growth process, but clearly further work (such as that of Greenhalgh, 1990) is needed to model more explicitly the non-price factors that determine the growth of demand for imports and exports. The other difference between the Thirlwall and Solow models is that growth in the former is essentially demand-determined.⁶

Underlying this model is a theory of the firm where prices are determined by a constant mark-up over unit costs. The firm sets the price and is prepared to meet demand at this price. An element of excess capacity is maintained to meet short-term increases in demand and a generally Keynesian approach is adopted in that investment is determined by the rate of growth of expected future sales. (See Blecker, 1998, for an elaboration of the possible microfoundations underlying this approach.)

Substituting equations [6.1] and [6.2] into [6.3], we obtain an equation for what might be termed the 'extended' balance-of-payments equilibrium growth rate of the country under consideration:⁷

$$y_{B1} = \frac{\omega \varepsilon z + (1 + \omega \eta + \psi)(p_d - p_f - \varepsilon r) + (1 - \omega)f}{\pi} \quad [6.4]$$

If changes in relative prices have no effect on the growth of income and the weighted growth rate of capital flows is relatively insignificant (both of which are generally the case, as we see below), the balance-of-payments equilibrium growth rate becomes $\varepsilon z / \pi = x / \pi$, which has come to be known as 'Thirlwall's law' (Thirlwall, 1979). (We denote this growth rate simply by y_B .) If the growth of productive potential (y_P) exceeds the balance-of-payments equilibrium growth rate, the actual growth rate (y_A) will be equal to the latter. It is the growth of income that adjusts to make $y_A = y_B < y_P$. The neoclassical approach, however, has the rate of change in relative prices relaxing the balance-of-payments constraint, allowing y_B to increase until it reaches y_P .^{8,9}

PRICE AND NON-PRICE COMPETITION IN INTERNATIONAL TRADE

As we have noted, a central tenet of this approach is that the rate of change in relative prices does not have a significant impact on increasing the balance-of-payments equilibrium growth rate, and hence the growth rate is given by Thirlwall's law. This is not to say that exchange rate adjustments have no effect on the current account at a given growth rate.¹⁰ What the empirical evidence does suggest is that it is implausible that a devaluation can affect the long-run growth rates of exports and imports and thereby remove the balance-of-payments constraint. Relative prices are unimportant in spite of the fact that they may change in the short run, either because these changes do not translate into sustained real exchange rate movements or, even if they do, they have little impact on trade flows. The reason for the former, especially in the short run, may be pricing to market and, in the longer term, the effect of real wage resistance.¹¹ Knoester (1995) provides evidence of real wage resistance for the advanced countries, which goes a long way to answering the criticism that this is an *ad hoc* assumption of the model. Even if there are changes in the real exchange rate (and this has been the case post-1972, although often in response to capital rather than trade flows), these have little impact because of the importance of non-price competitiveness and the fact that the price elasticities of demand for imports and exports are low. (The ineffectiveness of floating exchange rates after the breakdown of Bretton Woods soon became apparent. A floating exchange rate did not prevent the UK's sterling crisis of 1976, which resulted in the International Monetary Fund (IMF) being called in and subsequent deflationary policies being imposed. Nor did floating exchange rates prevent balance-of-payments crises in, for example, Italy in 1980-1 and France in 1982.)¹²

Moreover, changes in the real exchange rate are often reversed in the medium to long term. The success of a country in world markets is due to product innovation, namely, developing products for which world demand will rapidly grow. It is unlikely that merely reducing the prices of existing products by squeezing costs and real wages will be a successful long-term strategy. In other words, in the context of the long run, outward shifts of a producer's demand curve are more important than shifts down the demand curve.

There are now numerous studies estimating import and export demand functions as part of a test of Thirlwall's law, and these generally report estimated price elasticities that are either statistically insignificant, low or have a *priori* unexpected signs (see the discussion in McCombie and Thirlwall, 1994, chapter 3). For example, Alonso and Garcimartin (1998-9) estimated import and export demand functions for ten advanced countries using a disequilibrium approach. They found that although the individual price elasticities were

statistically significant in many cases, the sums of the absolute values of these price elasticities were not large, ranging from 1.41 (Canada) to 0.57 (Sweden) (excluding Japan, which had an exceptional value of 2.43). The Marshall-Lerner condition was satisfied in only 4 out of 10 cases. Moreover, with traditional multiplicative import and export demand functions, an increase in the balance-of-payments equilibrium growth rate requires a sustained rate of change of relative prices. For example, if $\omega = 1$, $\pi = 1.5$ and $|\eta + \psi| = 1.2$, relative prices must fall by 7.5 per cent per annum to bring about a permanent increase in the rate of output growth of one percentage point. (This is the same order of magnitude that was found for the UK using the National Institute of Economic and Social Research forecasting model – see McCombie and Thirlwall, 1994, chapter 10.) For the advanced countries at least, the rate of change in relative prices necessary to raise the equilibrium growth rate by one or two percentage points is likely to be much too large to be plausible.

There is also a good deal of other evidence that suggests that price competition is relatively unimportant. Kravis and Lipsey (1971), for example, found that few firms in Germany or the USA attributed their success in exporting to their price competitiveness. McCombie and Thirlwall (1994, chapter 4) discuss this and other evidence on the importance of non-price competitiveness in more detail.

The price elasticities of homogeneous products are likely to be significantly higher than for goods characterized by significant product differentiation. There is some evidence that a devaluation, by encouraging the production of more homogeneous goods, may actually switch production away from the more sophisticated products for which the world income elasticity of demand is high (Brech and Stout, 1981). Thus, paradoxically, a devaluation may harm the prospects for future export growth.

THE IMPACT OF THE GROWTH OF CAPITAL FLOWS

With increasing liberalization of international financial flows over the last couple of decades, it is important to see to what extent this has relaxed the balance-of-payments constraint. The answer, as we shall see, is not to any great degree.

International financial markets become increasingly nervous if the net foreign debt to income ratio approaches a certain critical maximum, although this value is likely to vary between countries. In the international debt crisis that began in 1982, the debt to GDP ratio of the 'Baker 15' less developed countries reached 46.6 per cent in 1984 (see Toye, 1992, Table 1.4, p. 27). We may therefore infer that any figure over about 40 per cent is likely to present

Table 6.1 *The relationship between the growth of income, the maximum net debt to income ratio and the maximum current account deficit to income ratio*

Growth of income (% per annum)	Current Account Deficit to Income Ratio (%)	(40)	(50)	(60)
1	(40)	0.4	0.5	0.6
2	0.4	0.8	1.0	1.2
3	1.2	1.2	1.5	1.8
4	1.6	2.0	2.0	2.4
5	2.0	2.5	2.5	3.0
6	2.4	3.0	3.0	3.6

Notes: Figures in parentheses are the net foreign debt to income ratios (percentage).

a less developed country (and some advanced countries) with serious financial problems. Let this maximum debt to income ratio be denoted by $D/Y = \theta_{max}$ where D and Y are the stock of real net foreign debt and the level of real income. Differentiating D/Y with respect to time gives $d(D/Y)/dt = \mu - \gamma(D/Y)$ where μ denotes the current account deficit expressed as a proportion of income. Setting $d(D/Y)/dt = 0$ it follows that $\mu_{max} = \gamma\theta_{max}$. In other words, for any given γ , θ_{max} implies that there is a maximum sustainable ratio of the current account deficit to income, and vice versa (see McCombie and Thirlwall, 1997b and Moreno-Brid, 1998-9 for an alternative derivation of this relationship). Table 6.1 reports the values of μ_{max} and θ_{max} for given growth rates of income.

What is interesting is that the balance-of-payments equilibrium growth rate need not necessarily imply that the current account should exactly balance, if financial markets are prepared to tolerate a certain persistent net debt to income ratio. Moreover, the faster the growth of income (and exports), the larger is the current account deficit that will be sustainable for any given debt to income ratio. Nevertheless, after an allowance is made for this, the effect on the balance-of-payments equilibrium growth rate is negligible.

To see this, first assume that there is no growth in real capital flows. From equation [6.4] (assuming that the weighted changes in relative prices are unimportant), the expression for the balance-of-payments equilibrium growth rate becomes $\gamma_{B2} = \omega x/\pi$. For a relatively open economy where the ratio of exports to income is, say, 30 per cent and the initial current account deficit is, for example, 2 per cent of income, $\omega = 0.94$. In other words, if we assume that $\pi = 1.5$, the balance-of-payments equilibrium growth rate will be given by

$\gamma_{B2} = 0.63x$ instead of by $\gamma_B = 0.67x$.¹³ Thus, for any given growth rate of exports, an initial balance-of-payments deficit on current account reduces the equilibrium growth rate. Or to put it another way, for any given growth rate of income, the growth rate of exports has to be commensurately higher if there is an initial current account deficit. But the differences are negligible. If $x = 4$ per cent per annum, γ_B equals 2.67 per cent per annum when the current account is in equilibrium. If however, the current account deficit equals 2 per cent of income, γ_B is reduced slightly as $\gamma_{B2} = 2.50$ per cent per annum.

What happens if we instead assume that the ratio of the current account deficit to income does not alter? Again assuming no changes in relative prices, the equation for the balance-of-payments equilibrium growth rate when $f = \gamma$ becomes:

$$\gamma_{B3} = \omega x/(\pi - 1 + \omega) \quad [6.5]$$

It can be seen that this growth of capital flows is unlikely to substantially affect the balance-of-payments equilibrium growth rate.¹⁴ If π is greater than unity, as is generally the case, the balance-of-payments equilibrium growth rate will be reduced. It will be unaffected if $\pi = 1$. For illustrative purposes, consider again our economy where exports are 30 per cent of income, $\pi = 1.5$, and the foreign exchange markets consider that a current account deficit of 2 per cent of income is sustainable. It follows that the equilibrium growth rate is given by $\gamma_{B3} = 0.65x$, whereas if there is no growth in capital flows and the current account is in equilibrium, $\gamma_B = 0.67x$. This result proves insensitive to the exact share of exports in income. If the figure is 10 per cent instead of 30 per cent, for a current account deficit equal to 2 per cent of GDP, $\gamma_{B3} = 0.63x$ and if the share of exports in income is 50 per cent, γ_{B3} only increases to 0.66x.

A small complication is that, as may be seen from Table 6.1, a current account deficit of 2 per cent of income will lead to a stabilization of the debt to income ratio at different values, depending on the growth rate. If financial markets set a maximum debt to income ratio, then the maximum current account deficit as a proportion of income will vary according to the growth rate. But once again, this does not significantly alter the balance-of-payments equilibrium growth rate. Suppose that $\theta_{max} = 50$ per cent. Then assuming exports account for 30 per cent of income, the growth of exports necessary for income growth of 2 per cent per annum is 3.1 per cent per annum, instead of 3 per cent when the current account balances.¹⁵ If the growth rate of income rises to 6 per cent per annum (which, as may be seen from Table 6.1, will lead to a sustainable current account deficit to an income ratio of 3 per cent), the necessary growth rate of exports is 9.3 per cent per annum (compared with 9 per cent per annum when the current account is balanced). Again, this result proves relatively insensitive to the degree of openness of the economy. The

overall picture is clear – even if there is a sustainable current account deficit, the quantitative impact on the equilibrium growth rate is so small that $y = x/\pi = \varepsilon z/\pi$, i.e. Thirlwall's law, will give a very good approximation to the balance-of-payments-constrained growth rate.

However, this is not to say that a rapid inflow of capital such as some less developed countries have experienced, even though unsustainable in the long run, may not temporarily enable the growth rate to exceed that predicted by Thirlwall's law (see Thirlwall and Hussain, 1982). This may be illustrated by a final numerical example. Suppose we have a less developed country with exports equal to 30 per cent of income, $\pi = 1.5$, its current account in balance and its net foreign debt equal to zero. Its exports are growing at a rapid rate of 8 per cent per annum and so y_B equals 5.33 per cent per annum. Let us further suppose that in year 1, there are capital inflows equivalent to 4 per cent of income and these grow at twice the rate of exports for the next ten years. The growth of income will increase by nearly one percentage point to 6.26 per cent per annum. However, by year 10, the debt to income ratio will have risen to 66 per cent and the ratio of the current account deficit to income will have increased to just over 10 per cent, which is likely to be unsustainable.

RECENT TESTS OF THE BALANCE-OF-PAYMENTS-CONSTRAINED EQUILIBRIUM GROWTH MODEL

Since the publication of Thirlwall's (1979) seminal article, there have been numerous attempts to test the balance-of-payments-constrained growth model. In this section, we briefly consider some of the studies that have been undertaken since those surveyed in McCombie and Thirlwall (1994), although no claim is made for completeness. The more recent studies use modern time-series analysis, such as testing for stationarity and cointegration, but these results have largely confirmed the results of earlier studies. For example, Andersen (1993) took a sample of 16 OECD countries and using pooled data for 1960–73, 1973–80 and 1980–90 concluded that having estimated the values of ε and π using an error correction model, there was a close relationship between y and y_B 'merely' in the long run. But, of course, it is precisely in the long run when the law is expected to hold.

In the spring edition of the 1997 *Journal of Post Keynesian Economics*, there was a mini symposium on Thirlwall's Law. Hieke (1997) showed that the model performed well for the USA over the period 1950–90, even though it has been able to run current account deficits for long periods. However, in the light of the discussion on capital flows above, and the fact that the current account deficit did not increase as a percentage of GDP, this

is not particularly surprising. During the period 1967–90, there was a substantial slowdown in the growth rate of the US economy, resulting from an increase in the income elasticity of demand for imports, which reduced y_B . This result was also found by Atesoglu (1995). Atesoglu (1997) showed that the USA's exports and income were cointegrated over the period 1924–94.¹⁶ This relationship broke down in the post-Bretton Woods era, but only due to increased capital flows that made it easier to finance current account deficits, rather than any relaxation of the balance-of-payments constraint resulting from the increased flexibility of nominal exchange rates.

McCombie (1997) surveyed the various methods for testing Thirlwall's law and revisited the law for the USA, Japan and the UK, explicitly allowing for structural breaks in the estimation of the import demand function. Japan has always been treated as an outlier, with y_A significantly below y_B . This has been accompanied by the accumulation of large trade surpluses. However, it was found that when the import demand function was estimated using first differences of the logarithms of the levels of variables, rather than the log levels themselves, the possibility that Japan was growing at its balance-of-payments-constrained growth rate could not be ruled out. Turner (1999) found that the post-1973 slowdown in the growth of the G7 countries could be explained in terms of the fall in the growth rate of world trade, together with the growing internationalization of the world economy.

Bairam (1997) found that for a small sample of less developed countries (LDCs), ε is negatively related to the level of per capita income while π showed no correlation (the latter is not surprising, given the prevalence of various forms of import controls in the LDCs). On the face of it, this would suggest that the less developed a country is, the less likely it is to be balance-of-payments-constrained. While the possibility of a relationship between the income elasticities of demand and the level of development is worth pursuing, Thirlwall (1997) suggests that Bairam's sample is too small for any firm conclusions to be drawn.

Hussain (1995) has examined the relevance of Thirlwall's law for the developing countries and suggests that the balance-of-payments constraint is more severe for the low-income African countries than for the more developed Southeast Asian countries. However, in many cases the estimates of the import demand functions are implausible, which is no doubt due to the existence of serious errors in the measurement of income for these countries arising from their large informal economies and their rudimentary collection of national income statistics. This indicates that care must be taken when testing Thirlwall's law for countries that are in the very early stages of development.

León-Ledesma (1999) tested Thirlwall's law for the Spanish economy over

the period 1965–93. Having estimated the import demand function and obtained a value of π , he used this together with mean decennial growth rates of exports in overlapping periods to calculate y_g . A close correspondence between y_A and y_g for most years was found and where there was a divergence, this was the result of a sudden change in capital flows (which were not incorporated into the formal model). León-Ledesma concludes that 'although for the periods that cover the two energy crises, the movement of relative prices and long-run capital flows could have been expected to have played a role, the long run regularly shows that the adjustment to balance-of-payments equilibrium came via income'.

Moreno-Brid and Perez (1999) and Perez and Moreno-Brid (1999) considered the applicability of the model to the long-term growths of countries in Central America (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and two Caribbean countries, namely the Dominican Republic and Haiti) over the period 1950–97. These countries have had a turbulent post-war experience, including stagnation during the 1980s (coincident with the debt crisis), and periods of political instability and repression. Both studies found that growth conformed to Thirlwall's law, with the exception of Haiti, where other factors had led to a growth rate below the balance-of-payments equilibrium growth rate. 'Its [Thirlwall's law's] empirical adequacy may be grounded on these developing countries' key dependence on imported machinery, equipment and other inputs from abroad so that the availability of foreign exchange puts a ceiling on the rate of domestic production'. A significant long-term relationship between the growth of exports and that of GDP is found, with no evidence of any significant effect of changes in the terms of trade on growth. Moreno-Brid (1999) also considered the degree to which Mexico's growth could be explained in terms of the balance-of-payments-constrained growth model. The results confirmed a positive and statistically significant cointegrating relationship between real GDP and exports over the period 1950–96. Interestingly, Mexico experienced sustained and rapid growth until the debt crisis of 1982 and a subsequent period of slow growth punctuated by balance-of-payments crises. The latter period was not accompanied by any marked slowdown in the growth rate of exports (their growth rate actually increased). Instead, there was a marked increase in the income elasticity of demand for imports from 1.04 over the period 1950–81 to 2.47 for 1982–96. This reduced the balance-of-payments equilibrium growth rate and is attributed by Moreno-Brid to the end of import substitution policies in Mexico and the liberalization of trade.

These studies suggest that, at the very least, explanations of long-run growth that ignore the role of demand and economic openness are likely to be incomplete.

CUMULATIVE CAUSATION, THE BALANCE-OF-PAYMENTS EQUILIBRIUM GROWTH RATE AND STRUCTURAL CHANGE

A major theme in Kaldor's later writings is that growth is a historical, rather than an equilibrium, process. It is to be understood not by reference to unexplained, exogenously determined data as in, say, the Solow model, but by reference to the growth path that has previously been traversed. Probably the clearest statement of this is Kaldor (1972) and, although this emphasis is usually contrasted with his attempts to model the growth process prior to his 1966 inaugural lecture, Setterfield (1998) has persuasively argued that the origins of Kaldor's interest in path dependency may be traced back much further, in particular, to one of his earliest papers, 'A classificatory note on the determinateness of equilibrium', published in 1934.

However, despite this, the 'standard' cumulative causation model of Dixon and Thirlwall (1975) that is often taken as providing a formal representation of Kaldor's post-1966 views on the growth process is essentially a model of equilibrium growth.¹⁷ This is equally true of Thirlwall's law.

These models are not, therefore, completely in accord with Kaldor's views of the growth process. Setterfield (1997) has suggested that perhaps the transitional dynamics of the Dixon–Thirlwall model are so slow that, in fact, all we generally observe is disequilibrium growth. If this were so, it would mitigate the seriousness of the problem, although not entirely remove it. This is because during the disequilibrium phase of growth in the standard cumulative causation model, an economy's growth rate is a function of its assumed initial growth rate. However, as has been shown by Roberts (2001a), for reasonable parameter and exogenous variable values, the model's transitional dynamics operate extremely rapidly – indeed, much more quickly than in standard neoclassical growth models.

More interestingly, Setterfield (1997) has suggested that an alternative approach to overcoming the inconsistency is to acknowledge that the exogenous parameters of the standard cumulative causation model are, in reality, 'deeply endogenous'.¹⁸ That is to say, they are not data that are fixed independently of an economy's past growth performance. Rather, there is a feedback from an economy's past growth performance to the values of the model's parameters, thereby rendering them dependent on its historical growth path. Thus, for example, Setterfield suggests that the income elasticity of demand for an economy's exports is a function of its past growth rates of output: that is, $\epsilon_x = f(y_0, y_1, \dots, y_{t-1})$ where $\partial \epsilon_x / \partial y_t \neq 0$.¹⁹ In particular, he argues that, at least for mature economies, previous fast growth rates of output are likely to have a negative effect on the income elasticity of demand for an economy's exports. This is because, if a country is to succeed in international

markets, it must, over time, keep up with the movement of international consumer demand through a commodity hierarchy. However, to do so requires a continual adaptation of the structure of production. Fast growth rates in previous periods might make this difficult because they tend to encourage the lock-in of a production structure that subsequently becomes outmoded.²⁰

One problem, formally speaking, is that specifying the income elasticity of demand for exports to be a negative function of previous growth rates is not a sufficient condition for removing the equilibrium properties of the standard cumulative causation model. Indeed, such a specification actually makes the equilibrium of the standard model more stable. This implicitly follows from Roberts's (2001a) demonstration that specifying the income elasticity of demand for exports to be a positive function of the previous period's growth rate slows down the transitional dynamics of the standard model. What is needed to transform the standard model into a truly historical model of growth is not only to specify the income elasticity of demand as a function of past growth rates, but as a *strongly non-linear* function of past growth rates (see Roberts, 2001b). In particular, while high values of previous growth rates may be allowed to have the negative impact on the income elasticity postulated by Setterfield, low values of previous growth rates must have a positive impact. This can be justified on the grounds that while high values of previous growth rates may be expected to give rise to the forces for lock-in that Setterfield describes, low values cannot. Rather, one would expect poor previous growth performance to give rise to a sense of dissatisfaction and thus to pressure for reform of an economy's production structure. This dissatisfaction can be expected to arise at two levels. The first is at the political level as the electorate becomes dissatisfied with poor growth rates, and the high levels of unemployment and low rates of real wage growth that inevitably accompany such a poor performance. The second is at the level of production itself, as shareholders become dissatisfied with the rates of return being earned on their investments.

However, our concern in this study is not with the standard cumulative causation model, but with the balance-of-payments-constrained growth model. Yet, identical considerations to those discussed above apply here. In this model, an economy's growth rate is traditionally specified as independent of its past growth performance. This is because the income elasticities of demand for imports and exports have been assumed to be exogenous. However, the income elasticities of demand do in fact change, albeit generally slowly, as relative non-price competitiveness changes. It therefore follows that while the model captures the Kaldor–Thirlwall idea that the balance-of-payments acts as a constraint on growth, it is inconsistent with Kaldor's wider views concerning the historical nature of the long-run growth process. Furthermore, it follows that one can overcome this problem by re-specifying the exogenous

parameters in this model as deeply endogenous functions of previous growth rates, with the functional forms being assumed to be strongly non-linear. In particular, for expositional purposes assume that:

$$(\varepsilon/\pi)_t = \gamma_1 + \gamma_2(\phi - \gamma_{t-1})\gamma_{t-1} \quad \gamma_1 > 0, \quad \gamma_2 > 0 \quad [6.6]$$

Where γ_1 , γ_2 and ϕ are constants, equation [6.6] specifies that the current ratio of the income elasticity of demand for an economy's exports to its income elasticity of demand for imports is a strongly non-linear function of its past growth performance, as represented by the growth rate of income in the previous period, γ_{t-1} . It should be noted that the non-linearity is such that the ratio of ε to π is increasing with γ_{t-1} at low levels of γ_{t-1} , but decreasing with γ_{t-1} at high levels of γ_{t-1} . This reflects the intuition outlined above that poor previous growth rates can be expected to give rise to pressure for reform, while high growth rates can be expected to encourage lock-in. Also, note that it has been assumed that it is the *ratio* of ε to π rather than just ε that is deeply endogenous here. This is plausible because, given that they both reflect an economy's non-price competitiveness, ε and π tend to be jointly determined. Thus, reform of an economy's production structure can be expected to not only increase its value of ε , but also reduce its value of π . Conversely, lock-in of a production structure that subsequently becomes outmoded can be expected not only to reduce its value of ε , but also increase its value of π .

Upon substituting equation [6.6] into Thirlwall's law, growth emerges as a historical process for plausible parameter and exogenous variable values. For example, assume $\gamma_1 = 0.70$, $\gamma_2 = 746.123$, $\phi = 0.10$ and that the growth rate of world income is constant at 4 per cent per annum. These values imply that ε/π is bounded from above by the value 2.565 and from below by the value 0.50 – values that are very similar to those experienced by Japan and the UK, respectively, during the period 1955–65 (see Houthakker and Magee, 1969; McCombie and Thirlwall, 1994; Krugman, 1989). The emergence of growth as a historical process in the model is depicted in Figure 6.1, which illustrates a growth path that commences from point A.

Examining Figure 6.1, it makes more sense to think of the periods t not as calendar years, but as growth eras. The figure shows the model economy evolving through a seemingly random series of growth eras, each growth era giving rise to the forces that bring about eventually, for better or for worse, its own demise. The seeming randomness of the growth era changes reflects the fact that the depicted dynamics are chaotic in nature, and it is this that makes the model a truly historical one of the growth process. This is because the chaotic dynamics rule out the existence of a determinate equilibrium growth rate at which the economy will settle down. Furthermore, they mean that it is not possible to predict an economy's future pattern of growth era changes without knowing its

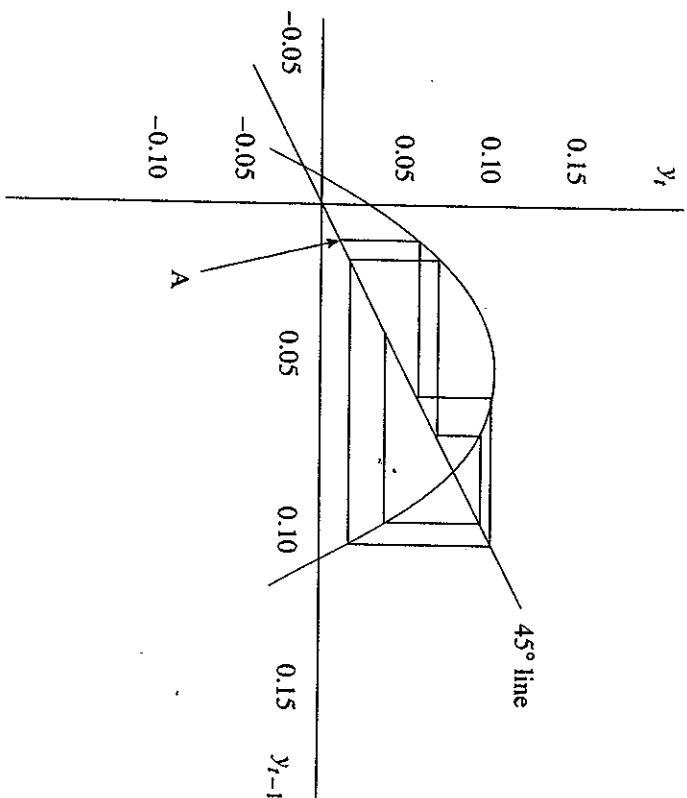


Figure 6.1 The balance-of-payments equilibrium growth rate when ϵ/π changes endogenously

growth rate during the current era with infinite precision, something that measurement and sample errors in data collection make impossible. This, in turn implies that the behaviour of the economy is strongly path dependent.

This approach is suggestive of the way future research may go, rather than being a definitive method. But it certainly accords with Kaldor's views on growth, according to which the state of the economy 'cannot be predicted except as a result of [perfect knowledge of] the sequence of events in previous periods [eras] which led up to it' (Kaldor, 1972).²¹

THE EAST ASIAN MIRACLE AND THIRLWALL'S LAW

We now briefly consider the implications of Thirlwall's law for economic development. We do not undertake any new statistical testing but show that the balance-of-payments-constrained growth approach can be a useful one for understanding development strategies.

The term 'economic miracle' has been justifiably used in the case of a number of East Asian countries that have achieved unprecedented high rates of both total and per capita output growth over the last three decades. The most notable successes are what have come to be known as the four 'Asian Tigers' (Hong Kong, South Korea, Singapore and Taiwan). Over the period 1965–96, the Tigers averaged growth rates of output per capita in excess of 6 per cent per annum. This is truly remarkable, given that these growth rates were sustained for more than 30 years. The Southeast Asian economies (Indonesia, Malaysia, the Philippines and Thailand) also grew rapidly on the coat-tails of the Tigers. Over the same 30-year period their average per capita growth rates were around 4 per cent per annum.²²

The causes of the rapid growth of the East Asian Tigers are still unresolved, but there are two main explanations. The first, stemming from the detailed growth accounting approach of Young (1992, 1995), and popularized by Krugman (1994), suggests that growth was largely the result of the rapid increase of factor inputs. On the other hand, the 'assimilationists' stress the role of the diffusion of innovations from the more advanced countries (see Nelson and Pack, 1999, for a recent discussion of these views and one which tends to support the latter interpretation). There is not space here to discuss these competing explanations: suffice it to say that most of the evidence seems to be that growth was export-led, resulting in high rates of capital accumulation. There has also been a debate about whether growth was, in Wade's (1990) terms, based on the 'free market', the 'simulated free market' (where governments intervened to correct distortions and hence attempted to simulate the free market) or the 'governed market' (where there was active government intervention). Wade's careful analysis of the somewhat conflicting evidence suggests that the governed market was the rule rather than the exception. It is also noticeable that in much of neoclassical growth theory, there is virtually no mention of international trade or the growth of exports except where it is to discuss technological externalities or spillovers. Yet discussions of the Asian miracle, whether from a neoclassical or any other viewpoint, are often centred on the role of exports, although there is controversy over the direction of causation.

There has been a plethora of cross-country regression studies using various samples of advanced countries and LDCs that have attempted to explain the determinants of growth. Of particular interest in this context is the study of Thirlwall and Sanra (1998). Surveying the literature, they note that when a trade variable is included 'it is invariably insignificant or loses its significance when combined with other variables'. But in many studies this is because the effect of trade appears to work through investment. If this is the case, it is an interesting and significant conclusion, because it means that many of the studies would support the Keynesian/post-Keynesian position that it is not saving

that drives investment, but trade and the growth of output itself'. Their own empirical work suggests that export growth (as opposed to static measures of the degree of openness such as the ratio of exports to GDP) is a significant determinant of economic performance and that the debt-service ratio is also an important constraint on economic growth in developing countries.

In the East Asian countries, it was deliberate government policy (at least initially) to encourage the development of those exports for which world demand was either growing, or was likely to grow fast. The export structure in East Asia has, in the words of the World Bank (1998), 'become characterized by (a) early exit from low-skill labour-intensive exports; (b) specialization in high-technology exports, and (c) strong inter-regional links'. In terms of the balance-of-payments-constrained growth model, this led to high income elasticities of demand for the region's exports that enabled a fast growth of demand through the dynamic Harrod trade multiplier and the Hicks super-multiplier.²³

Although their sample period is now somewhat dated, Bairam and Dempster (1991) have provided some estimates of balance-of-payments equilibrium growth rates for four of the East Asian countries, namely, Singapore, Indonesia, the Philippines and Thailand. Their results are presented in Table 6.2.

It can be seen that both specifications of Thirlwall's law give a good approximation to the observed growth rates of the East Asian countries. A corollary is that capital flows and the rate of change of relative prices had little impact on the equilibrium growth rate (it should be remembered that this period was before financial liberalization led to a rapid increase in short-term capital flows). In all cases but one, the estimated price elasticities of demand were not statistically different from zero, and in the one case where a price elasticity was significant (the price elasticity of demand for exports for Indonesia), it took the wrong sign. The key to the fast growth rates of these countries was thus the especially high income elasticities of demand for their exports.

Table 6.2 *Balance-of-payments equilibrium growth rates in selected Asian economies*

Country	Period	ϵ	π	$y_B = \epsilon z/\pi$	$y_B = x/\pi$	γ
Singapore	1973-80	7.9	3.6	7.5	9.2	8.2
Indonesia	1966-85	3.5	2.7	4.8	7.9	6.5
Philippines	1961-85	2.6	2.4	4.1	4.1	4.4
Thailand	1961-85	3.4	1.9	6.8	7.0	6.9

Source: Bairam and Dempster (1991).

More recently, Ansari, et al. (2000) have undertaken a further analysis of the applicability of Thirlwall's law to Indonesia, Malaysia, the Philippines, and Thailand over the period 1970-96. The terminal date was chosen to exclude the period of the East Asian financial crisis. They calculated the average balance-of-payments-constrained growth rate (excluding any allowances for the growth of capital flows) for these four countries to be 5.41 per cent per annum, while their actual average growth rate was 6.40 per cent per annum. The difference between the actual growth rate, y and y_B was only statistically significant in the case of Thailand, where $y > y_B$. Ansari et al. attribute this to the marked deterioration in Thailand's trade deficit as a percentage of GDP after 1983, which resulted from the decline in export earnings of tin, sugar and tapioca. The imposition of quota restrictions further exacerbated the situation. It is interesting to note that this explanation is couched in terms of the relative failure of export performance, rather than in terms of physical supply constraints. It is also instructive to note that while the price term took the *a priori* expected sign in Ansari et al.'s regressions, it was only statistically significant in the case of the Philippines. In the cases of Indonesia, Malaysia and the Philippines, Ansari et al. conclude that 'Thirlwall's proposition cannot be rejected... The main policy implication is that these countries should continue to follow the outward-looking growth strategy with emphasis on export performance for a continued high rate of economic growth'.

As we have seen above, the achievement of a high income elasticity of demand for exports is not the result of a once-and-for-all effort. Over time, with technical change and product innovation, world tastes and sectoral demand are continually changing, and to maintain a growth rate above the world average requires a continual process of rapid structural change. Based on his work on what constitutes a successful development strategy, Wade (1990, p. 362), following some sceptical comments on the effectiveness of devaluation, emphasized the importance of non-price competitiveness, broadly defined:

Where, nevertheless, heavy reliance is to be placed on trade, the government must recognise that successful exporting of manufactured goods to richer countries is not just a matter of getting the exchange rate right and keeping labour cheap, in the absence of protection. This is because many kinds of manufactured exports to richer countries are only saleable as complete packages meeting all buyer specifications, including packaging, labelling, colors, raw materials, finishes and technical specifications. Costs rule out the option of importing an incomplete or defective package and correcting the defects in a subsequent stage of manufacturing. Thus, marketing, transmission of information and quality control turn out to be the key activities for export success. Buyers can supply some of these services; but especially because of externalities the government also has an important role. The government can arrange for information about foreign markets and about domestic suppliers to be easily and freely available; it can directly help the promotion of some products (e.g.

through trade fairs); and it can help to curb the tendency of firms without brand names to compete by producing shoddy goods, spoiling the country's reputation for other producers. Very importantly, the government can also inspire producers to seek out export markets as a normal part of their operations.

Nevertheless, there are limits to a strategy of export-led growth, and we now turn to a consideration of this.

EXPORT-LED GROWTH STRATEGIES AND THE FALLACY OF COMPOSITION

One potential criticism that needs to be examined is that the export-led growth strategy is flawed as it is subject to a fallacy of composition. As already mentioned, Tiebout (1956) correctly pointed out that, for the world as a whole, growth cannot be export-led. Moreover, there are problems for individual countries, especially the LDCs, in trying to promote export-led growth, especially if they concentrate on similar industries. A particular country will inevitably face fierce competition from other countries in the same position, and may find that a successful growth strategy can only be achieved at the expense of another country. But ironically, while this could be treated as a weakness of the balance-of-payments-constrained growth model, precisely the opposite is the case. The fact that *all* countries are unlikely to be able to generate fast rates of growth of exports that will enable them to raise their rate of growth to that of their productive potential shows the importance of the external constraint. There is the danger of confusion here between the export-led growth theory and the balance-of-payments-constrained growth theory. The early export-led growth theories did not incorporate a balance-of-payments constraint (see, for example, Beckerman, 1962). To argue that an export-led growth strategy for a particular country is necessary for rapid growth not to be hindered by balance-of-payments crises is not the same as implying that all countries can simultaneously achieve any growth rate of exports they desire. It has been argued that, in the long run, the only effective strategy is to encourage production of those goods for which there is a high world income elasticity of demand.²⁴ But if a number of countries are simultaneously trying to follow such a policy and, especially if they are concentrating on the same group of export industries, the end result may be that only a few of the countries will, *ex post*, achieve a marked increase in e . The others may simply have been running fast to stay still, and concomitantly, excess capacity may develop.²⁵ In fact, one could argue that if the simple export-led growth theory did not suffer from a fallacy of composition, there could be no such thing as balance-of-payments-constrained growth in the long run.

The problem is that by generating a rapid domestic expansion, countries experience a rapid increase in imports from other countries. If they cannot increase their growth of exports *pari passu*, then they are likely to encounter a balance-of-payments crisis. This problem may be compounded by the fact that the additional imports need not be supplied by the countries to which the economies in our example are trying to export. There may be a geographical mismatch in the composition of the growth of demand, which would need to be analysed in a three-country model. The problem is also exacerbated by some countries (such as Japan) running substantial trade surpluses. An implication is that persuading these countries to open their markets may be one way to increase the growth rates of balance-of-payments-constrained economies, although this will be a one-off effect. Far more damaging to the growth of, for example, the Asian countries for which Japan provides the major export market has been the substantial decline in Japan's growth rate since the mid-1970s.

Kaldor (1981) was fully aware of all this, and summarized the situation as follows. The newly industrializing countries (NICs) will generate increased export penetration in the advanced countries. The resulting increase in the growth of income in the NICs will, in turn, stimulate the growth of demand for the industrial countries' exports. But as Kaldor remarks:

there is no guarantee that if we take any arbitrarily chosen pair of countries, or even a group of 'developed' or developing countries... that these two changes – reduced export share of the older industrialized countries and the increase in total world demand – will fully offset one another. Taking any individual manufacturing exporter, the tendency to such an offset (which is the same as the tendency for a country to gravitate to a state of equilibrium in its external balance of payments) may well be brought about through variations in growth rates.

If we were in a neoclassical world where countries faced an infinitely elastic price elasticity of demand for their exports, there could be no such thing as a balance-of-payments constraint. The foreign exchange revenue required to fund the growth in imports would be generated through an increased growth in exports resulting from an infinitesimal rate of change of relative prices. Likewise, if through industrial policies countries could actually increase the income elasticities of demand for their exports irrespective of the actions of competitor countries, then, in the long run, the balance-of-payments constraint would no longer exist. But it should be remembered that if a group of countries are following this strategy in a related product area, *ex post*, none of them might find that their income elasticity of demand for a particular type of export has risen to any large extent. There are limits to the rate of growth of exports on a global scale, which in fact imposes a constraint on the growth rates of individual countries, and which constrains their rate of economic growth

below its potential. This does not mean, however, that there is necessarily any more efficient method of increasing the rate of growth. It would be erroneous to interpret Thirlwall's law as implying all countries could, by pursuing export-led growth strategies, simultaneously achieve any desired rate of growth of output.

CONCLUSIONS

This chapter has discussed one major aspect of the Kaldorian approach to economic growth, namely the importance of the growth of autonomous demand. In particular, it has been shown that, in open economies, the key to understanding a country's economic growth is to be found in the performance of its exports, or rather in the ratio of the income elasticities of demand for exports and imports together with the growth rate of the rest of the world – as encapsulated in Thirlwall's law. A corollary of this is that changes in relative prices do not affect the growth rates of exports and imports, at least in the long run, and that the growth of capital flows does not significantly raise the balance-of-payments-constrained growth rate in the long run. It has been shown that recent tests of Thirlwall's law have confirmed the results of earlier studies that support the law. Estimates of balance-of-payments-constrained growth rates generally closely approximate actual growth rates.

As Davidson (1990–1) has noted, problems will arise for LDCs if they concentrate on exporting raw materials and other basic commodities for which Engel's law suggests the advanced countries have low income elasticities of demand. This is the case even though the static comparative advantage of LDCs lies in these goods. Furthermore, if these countries also have a high income elasticity of demand for the manufactured products of the advanced countries, then their balance-of-payments-constrained growth rates will be commensurately lower than those of the advanced countries. This suggests that 'if economic development and balance of payments equilibrium is left to the free market then [Thirlwall's law] indicates that the LDCs are condemned to relative poverty, and the global inequality of income will become larger over time' (Davidson, 1990–1). Convergence in productivity levels and per capita income is by no means assured by the operation of market forces.

NOTES

1. For a discussion of Kaldor's agriculture/industry two-sector model and a more detailed treatment of some of the issues raised in this paper, see McCombie and Roberts (2000). Kaldor's emphasis on the role of increasing returns in economic growth is considered by McCombie (2002).

2. The growth of autonomous demand could also be the growth of agricultural demand. The transition between agricultural-led and export-led growth is not satisfactorily modelled at present and awaits the attention of future researchers. Thirlwall (1986) makes some suggestions as to how this may be accomplished.
3. Thirlwall (1997) provides an interesting discussion of the derivation of his approach and the relationship of his work to that on similar lines by Kaldor. Although Kaldor never devised a formal model, he intuitively saw many of its conclusions. In 1977, two UK government economists questioned whether the UK had a balance-of-payments problem since, while imports as a proportion of GDP had grown markedly over the postwar period, so too had exports. But as Kaldor pointed out, any *autonomous* increase in the share of imports in national income reduces demand for domestic goods and investment 'until a sufficient contraction occurs in the gross domestic product relative to exports to make the spontaneous rise in one ratio to be matched by an induced increase in the other'. Kaldor (1981) presents an analysis using Thirlwall's balance-of-payments-constrained growth model to explain growth rate differences.
4. More recent neoclassical trade and endogenous growth models are, however, beginning to consider these factors.
5. Note that it is the relative differences, not the absolute values, of the income elasticities that matter. Although the average values of ϵ and π may fall in the long run, this will not prevent some countries still being balance-of-payments-constrained.
6. The earlier 'standard' model of cumulative causation of Dixon and Thirlwall (1975), which did not include a balance-of-payments equilibrium constraint, had the Verdoorn law as an integral part. (The Verdoorn law is the empirical relationship which shows that a faster growth of output induces a faster growth of productivity. See McCombie and Thirlwall, 1994, chapter 2.) Starting from an initial position, an increase in the growth rate will, via the Verdoorn law, give rise to a positive feedback through an improvement in relative prices. However, given plausible parameter values, the growth rates in the model will converge to an equilibrium rate. It is a straightforward matter to include the Verdoorn law in the model above. However, given the fact that relative prices play an unimportant role in the model, the Verdoorn law instead leads to a faster-growing country having a faster growth of real wages (assuming rates of exogenous productivity growth are the same for all countries). It, therefore, does not affect the balance-of-payments equilibrium growth rate. Thus, for expositional ease, we have not incorporated it into the balance-of-payments-constrained model.
7. While this incorporates the balance-of-payments identity, equation (6.4) is not itself an identity. There is no reason, *a priori*, why the two income elasticities of demand should be statistically significant. Indeed, under the neoclassical approach where changes in relative prices equilibrate the balance of payments, there is no theoretical reason why this should be the case.
8. The balance-of-payments-constrained growth model has not been without its critics. For a discussion of the more important objections that have been raised concerning this approach together with a rebuttal, see McCombie and Thirlwall (1997a).
9. See McCombie (1993) for a generalization to a two-country model and one that also explicitly includes the domestic determinants of economic growth.
10. Thus the approach does not simply assume that changes in relative prices have no effect at all on trade flows, as is sometimes erroneously asserted.
11. Real wage resistance implies that *relative* purchasing power parity holds. This should not be confused with the neoclassical theory of *absolute* purchasing power parity.
12. Kaldor, who had originally been an advocate of floating exchange rates, soon changed his mind in the light of this experience.
13. Note that as exports are growing faster than income and imports, both ω and the current account deficit will decrease slowly over time. If exports grow at 8 per cent per annum over a ten-year period, the average value of ω is 0.95. However, we shall ignore this minor complication here.
14. It is assumed that $(\pi - 1 + \omega) > 0$, which implies $(1 - \omega)/\pi < 1$. To see what happens if this is not the case, let us assume that $f = \gamma_{t-1}$ (where we have dropped the subscript B3 for notational ease) and $x_t = x_{t-1} = x$. If $(1 - \omega)/\pi > 1$, the solution to the difference equation

- $y_t = \omega y/\pi + (1 - \omega)y_{t-1}/\pi$ is explosive and there is no balance-of-payments equilibrium growth rate. It should also be noted that unless $\pi = 1$, ω will change slowly over time. The intuition is that ω will only be constant if both x and f are equal to the growth of total foreign exchange receipts and thus imports. Given that y is a weighted average of x and f this can only occur if $m = y$. However, $m = y$ will only hold, and hence ω will only be constant, if $\pi = 1$. If $\pi > 1$, which is empirically likely to be the case, there will be global stability with ω converging to 1, thus yielding Thirlwall's law ($y_g = x/\pi$). If $\pi < 1$, then there is only saddle-path stability and, in general, ω will tend to explode (Barbosa-Filho, 2001). In the latter case, the government will have to use exchange rate adjustment or, as this is likely to be ineffective, alter the growth rate by domestic demand management policies to take the economy on to the stable manifold. The discussion in the text assumes that the length of the period is such that ω is approximately constant.
15. If $\theta_{max} = 50$ per cent, then if y is 2.0 per cent per annum, the maximum sustainable current account deficit to income ratio is 1 per cent (see Table 6.1). Thus, from $y_g = \omega x/\pi - 1 + \omega$, it follows that $y_g = 2.0 = 0.645x$ per cent per annum, or $x = 3.1$ per cent per annum. See also the chapter by Alesoglu in this volume.
16. Dixon and Thirlwall (1975) argued that 'it also serves some purpose to give a not (unrealistic) specification which suggests on empirical grounds that divergence is not very likely, if only to induce those who adhere to the cumulative causation model to specify more precisely the model they have in mind and to show the conditions under which regional growth rates would diverge through time'. They argue that the most likely extension would be that 'the price and income elasticities could change in the course of time as the structure of production changed'. We show below how this may be accomplished in the context of the balance-of-payments-constrained growth model.
17. See also the chapter by Setterfield in this volume.
18. He gives another example of this mechanism as affecting the value of the Verdoorn coefficient.
19. Conversely, it is possible that a more rapid rate of growth, through generating a faster rate of capital accumulation, may induce enterprise (rather than defensive) investment - to use Lamfalussy's term - together with a faster increase in R&D expenditure and product innovation. This may actually lead to higher values for the world income elasticities of demand for a particular country's exports.
20. Figure 6.1 indicates that the rationale required to justify the non-linear functional form specified for ϵ/π is slightly more subtle than is indicated in the main text. This is because to the left of the intersection between the curve depicting the function and the 45° line, the gap separating the two at first increases before proceeding to decline. The implication is that the pressure for reform must have a positive (absolute) impact on ϵ/π that at first increases with y_{t-1} before then declining. This can be justified by arguing that reform of an economy's production structure is a costly business. At low levels of y_{t-1} , a marginally higher y_{t-1} is then associated with greater positive reform because the higher y_{t-1} , provides more revenue to both government and firms to finance reform measures. However, at higher levels, a marginally higher y_{t-1} is associated with less positive reform because the pressure for change has diminished to a level where revenue to finance what is demanded is no longer a problem.
21. 1997 saw the onset of the East Asian financial crisis which caused a collapse in growth rates in the region. It is beyond the scope of this study to consider the causes of this save to note that, currently, there has been some recovery in East Asian economic performance. For a survey of the issues involved, see Nixon and Walters (1999).
22. It should not be forgotten that a vibrant export sector is important for other reasons, especially in LDCs. The more open an economy, the greater the degree of competition and the faster the rate of diffusion of innovations. A faster growth of exports also means that foreign exchange earnings grow more rapidly, allowing a greater growth of imports of advanced technological capital equipment. Trade also allows greater specialization in production and hence enhanced possibilities of benefiting from economies of scale (see Edwards, 1993, for a survey).
23. Hence an industrial strategy (infant industry protection, export subsidies, etc.) may be necessary to improve the rate of growth of exports.

25. An implication is that to increase the success of an export-led growth strategy, countries, especially the LDCs, should not concentrate on the same broad product areas.

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