Export-led growth, real exchange rates and the fallacy of composition

By

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Introduction

In the past two decades, developing countries have significantly increased both their export orientation and the proportion of their exports that consists of manufactured goods.[1] These shifts have been driven by several motivations, including the perceived inefficiencies of inward-oriented, import-substitution industrialization, a desire to avoid the historically recurring problem of falling terms of trade for primary commodities and a belief that manufactures offer superior long-run development prospects compared to primary commodities. The increasing reliance on manufactured export-oriented growth strategies has had some stunning successes, particularly in the so-called 'four tigers' (South Korea, Taiwan, Hong Kong and Singapore) in the 1970s and 1980s and China in the 1990s and early 2000s. Nevertheless, for a large number of countries that have sought to join on this bandwagon, the results have been disappointing. While a small group of East Asian nations have used manufactured exports to propel themselves into a process of convergence with the industrialized economies of the global 'North', most of the countries in the 'South' that have specialized in manufactured exports over the past two decades have not achieved similar success.

The uneven growth performance of the developing countries most specialized in manufactured exports in the past three decades is shown in Table 1. The growth of the four tigers ('newly industrialized Asian economies'), which averaged 7.7 percent per year in the 1980s, slowed down in the 1990s and 2000s, when many other developing countries began to enter the market for manufactured exports. China grew at rates of about 10 percent per year throughout all the periods shown, and India accelerated to 7.7

percent in 2000-7. However, the twelve other emerging and developing economies specialized in manufactures increased their average growth rates only marginally (from 3.8 percent in 1980-89 to 4.5 percent in 2000-7) in spite of the fact that many of them were plagued by the debt crisis in the 1980s, and never came close to the earlier rapid growth of the four tigers or the more recent success of China and India. Between 2000 and 2007, these twelve economies actually grew more slowly than the average for all emerging and developing economies (6.4 percent) as the countries that were specialized in primary commodities benefited from the commodity price boom during that period.

[Table 1 about here]

Undoubtedly, many factors impact on countries' growth rates and domestic policies contribute to the success or failure of export-led growth strategies. Nevertheless, the inability of so many countries to fully emulate the rapid export-led growth of the East Asian countries and to withstand growing Chinese competition raises the possibility of what has come to be known as the 'fallacy of composition', that is, an adding-up constraint on the efforts of numerous developing countries to simultaneously export similar types of manufactured goods to the same industrialized country markets. In theory, the exporting nations need not face demand-side constraints, under certain optimistic conditions: (1) the industrialized countries grow rapidly enough to accommodate increasing volumes of developing country exports of manufactures without depressing the prices of those goods (or alternatively, the income elasticity of demand for developing country exports is very high); (2) the developing nations provide increasing amounts of reciprocal demand for each other's exports via 'South-South' trade to relieve the constraints emanating from limitations on industrialized countries' demand; or (3) the

developing countries as a group move in a 'flying geese formation' in which the relatively more advanced ones move on to more capital-intensive and technologically sophisticated products, thereby making room for new entrants exporting more labor-intensive, standardized products. Although there is some evidence for conditions (2) and (3) holding for certain countries in some time periods, there is little evidence for condition (1). Furthermore, a growing body of research suggests that these optimistic conditions do not hold generally and, as a result, most developing country exporters of manufactures are subject to significant demand-side constraints arising from their competition over the same export markets in similar products. The rest of this chapter reviews this mounting evidence and discusses its policy implications.

Previous literature

Many of the arguments in favor of manufacturing export-led growth have implicitly assumed a 'small country' paradigm, in which each country's exports can increase without quantitative limit and without putting downward pressure on their prices. These arguments do not consider what happens if a large number of developing countries pursue export-led growth by targeting the same industrialized country markets simultaneously. In other words, what are the consequences when a large number of small countries add up and essentially act as a 'large country' in the global market for manufactured exports? Studies that have addressed this issue can be divided into two broad groups and several sub-categories.[2] In the broadest terms, the two main types of studies are those that have tested for negative effects of intra-developing competition on

export performance and those that have examined the impact of that competition on growth rates. We shall consider each group briefly in turn.

The literature that has focused on exports contains three main branches: (1) studies of quantitative crowding-out or displacement; (2) studies of negative effects on prices of manufactured exports; and (3) studies of price competition limiting export growth among the developing countries. Empirical studies of quantitative displacement began with the pioneering work of Cline (1982), who suggested that it would be difficult for very many countries to emulate the success of the four tigers from the 1970s. Blecker (2002) and Palley (2003) found evidence of crowding out of imports from certain countries in the US market in certain periods, but did not study global competition or control for other variables. More recently, several studies (for example, Eichengreen, *et al*., 2007) have sought to identify the effects of China's entry in the global economy on the exports of other developing countries (including exporters of primary commodities, who generally benefit, as well as exporters of manufactures, who tend to lose). Razmi (2007b) improved on the earlier econometric studies of the displacement hypothesis by controlling for exchange rates and total demand, and his work is summarized below.

With regard to negative price effects, Kaplinsky (1993, 1999) has suggested that many manufactured export products have become 'commoditized' and now behave more like primary commodities in the sense that they are prone to suffer declining terms of trade when exported in increasing volumes. He also suggests that the need to compete via low prices pressures developing countries to suppress real wages and devalue their currencies, thereby limiting the income gains from exports. Evidence about trends in the terms of trade for developing country exports of manufactures is mixed overall, but using

disaggregated EU import data Kaplinsky and Santos-Paulino (2006) have found that less technologically advanced exports from lower-income countries are falling in relative price. US import data show a general decline in the relative price of imports of all manufactured goods from developing countries compared with manufactured imports from industrialized countries from 1991-2007, and this is just as true for the East Asian newly industrializing countries as it is for all developing countries (see Figure 1).[3]

[Figure 1 about here]

Turning to price effects on export demand, Faini et al. (1992) and Muscatelli et al. (1994) were the first to identify significant price-substitution effects in competition among developing nations for manufactured export markets in the industrialized countries. While these studies estimated export demand functions for individual developing nations, Razmi and Blecker (2008)—in addition to providing estimates for individual countries using more recent data and better price indexes—also tested for overall price competition effects using panel data methods. Dividing their sample of 18 countries into panels of low- and high-technology exporters, they found that price competition was more significant among the low technology exporters while the income elasticity of export demand was higher for the high-technology exporters. An updated version of these results is presented below.

Turning to the second broad group, only a small number of recent studies have tested for growth or output impacts of competition among developing countries for export markets. These studies have mainly focused on whether relative prices or real exchange rates of developing country exporters of manufactures have a significant impact on their overall macroeconomic performance. Before discussing this empirical research, a brief

summary of the underlying theoretical issues is in order. Traditionally, mainstream macroeconomics has downplayed the role of the real exchange rate as a policy instrument, considering it to be a variable whose equilibrium value is given at a point in time by factors such as technology, factor endowments and tastes. Any temporary deviations are counteracted by the tendency of relative prices of tradables to move towards maintaining (absolute or relative) purchasing power parity. Classical neutrality of money allegedly ensures the insulation of real variables from changes in their nominal values beyond the short run.

Many development economists have also often taken a skeptical view of the utility of the real exchange as a development tool, although on different grounds. Traditionally, developing countries were categorized as exporters of primary commodities and agricultural products, the demand for which is relatively price-inelastic. The nonsatisfaction of the Marshall-Lerner condition implies that exchange rate devaluations could result in undesirable and destabilizing consequences.[4] Considering that manufactures now constitute the largest share of exports from developing countries as a whole, this concern has become of less importance. Indeed, given the increasing competition amongst developing country manufacturers, one might expect to see relatively high cross-price elasticities of demand for such products.

The Post Keynesian balance-of-payments-constrained growth (BPCG) model provides a convenient theoretical framework for thinking about demand-side constraints on export-led growth.[5] However, the original BPCG model assumed that each individual country's export performance was independent of other countries' exports, and it also assumed that demand was relatively price-inelastic (or else that purchasing power parity

prevented relative prices from changing in the long run). Blecker (2002) addressed the first problem by synthesizing the 'almost ideal demand system' (AIDS) developed by Deaton and Muellbauer (1980) with the BPCG framework to create a model in which relative price changes among a large number of countries can affect the output growth rates of the exporting nations, on the assumption that their growth is constrained by the requirement of maintaining balanced trade. The AIDS specification allows for the incorporation of an adding-up constraint on the growth of exports from a group of countries that compete for shares in the same industrialized country markets. Since the growth of exports places a constraint on output growth in the BPCG framework, an adding-up constraint on export growth, in turn, translates into an adding-up constraint on output growth. Blecker also dropped the assumption that relative price (real exchange rate) effects are negligible, especially when considering competition by countries exporting similar products to the same markets. Subsequently, Razmi (2004) extended Blecker's model to incorporate capital flows. The presence of capital flows (thus relaxing the assumption of balanced trade) and the focus on relative price changes render the model more suitable for application to short-run changes in output.[6]

Recent empirical work has generated a fair amount of evidence that the real exchange rate does, in fact, play a significant role in influencing output growth. This, along with the refusal of China to let its currency rapidly appreciate or freely float—presumably on the grounds that it will harm China's investment- and export-led growth strategy—has led to a renewed interest in the role of the exchange rate as a development policy tool. In a comprehensive study that identifies more than 80 episodes of sustained growth since the 1950s (that is, growth spurts that lasted more than eight years),

Hausmann *et al*. (2005) find few statistically significant economic indicators of growth accelerations. They do, however, find that depreciated real exchange rates are robust correlates of such episodes. Similarly, using econometric techniques to identify structural breaks in growth paths, Berg et al. (2008) find that competitive exchange rates are one of the few factors that are robustly correlated with prolonged growth spells.

Levi-Yeyati and Sturzenegger (2007) hypothesize a 'fear of appreciation', as opposed to the 'fear of floating' originally suggested by Calvo and Reinhart (2002). While the latter term was coined to refer to the fear of dramatic depreciations preceding or during currency crises, Levi-Yeyati and Sturzenegger argue that the rapid growth of foreign exchange reserves in developing countries reflects a fear of floating in reverse, which leads them to (successfully) intervene in foreign exchange markets to maintain a depreciated real exchange rate. Furthermore, these authors explore the relationship between real exchange changes and growth econometrically, finding that undervaluation is correlated with faster employment and output growth. Notably, the positive relationship appears to go beyond short-term cyclical changes to long-run growth. However, the boost to long-run growth seems not to work through greater export volumes or import substitution, but rather through greater investment and savings.

Polterovich and Popov (2002) find that the accumulation of foreign exchange reserves contributes to developing country economic growth.[7] Moreover, the reported estimates suggest that only reserve accumulation under positive external balances (as opposed to reserves following from foreign borrowing) result in beneficial undervaluation of the exchange rate. They explain these results partly by hypothesizing that the accumulation of reserves leads to exchange rate undervaluation, which in turn

results in external surpluses, higher investment and savings, and export-led growth. Razin and Collins (1997) found that low-to-moderate real exchange rate undervaluations are correlated with accelerated growth. The relationship displays important nonlinearities, however. For example, large undervaluations are not associated with more rapid growth.[8]

While this emerging body of literature has renewed interest in the phenomenon of real exchange rate management, it does not distinguish between real exchange rate changes relative to other industrialized countries versus those relative to other developing countries. Blecker and Razmi (2008) addressed this problem by constructing separate real exchange rate indexes for each developing country exporter in their sample relative to (a) the industrialized countries' currencies and (b) the currencies of rival developing country exporters.[9] Using panel data methods, they found that real depreciations relative to the industrialized countries generally have contractionary effects—as hypothesized in the large literature on 'contractionary devaluations'[10]—but that real depreciations relative to competing developing countries generally have expansionary effects on output growth. These results, which differ in some subtle respects between different groups of developing country exporters, are summarized below.

Empirical hypotheses and econometric results

As the preceding discussion makes clear, there are a number of ways of specifying the fallacy of composition (FOC) hypothesis that have different empirical implications. In this section, we consider three specific FOC hypotheses and corresponding econometric tests.[11] The three hypotheses are:

- **FOC-quantity**: This is the simplest version of FOC, which is the idea of quantitative displacement or crowding-out of the exports of some developing countries by exports from other developing countries.

- **FOC-price**: This refers to intra-developing country price competition over export markets in the industrialized countries, which is usually tested by estimating export demand functions for developing country exports of manufactures.

- **FOC-growth**: This refers to positive output or growth effects of real depreciations (lower relative prices of exports) with respect to rival developing countries competing in the same industrialized country markets. This is the strongest version of FOC, which is motivated by the theoretical model of Blecker (2002) and Razmi (2004) discussed earlier.

In the remainder of this section, we discuss the econometric models used to test each of these hypotheses and the results thereof in turn. In all cases, we define manufactures as consisting of products falling under standard international trade classification (SITC) categories 5 (chemicals and related products), 6 (manufactured goods classified chiefly by material (including rubber, textiles, iron and steel), 7 (machinery and transport equipment (including telecommunications, electrical, computers, other electronics and automobiles) and 8 (miscellaneous manufactured articles including furniture, apparel, footwear and instruments), excluding category 68 (non-ferrous metals). In all of the econometric estimates presented below, endogeneity issues are addressed by using the General Method of Moments (GMM) approach, which utilizes the lagged values of the dependent and independent variables as instruments.

Crowding out (FOC-quantity)

The most basic idea of FOC is the notion that exports of manufactures from one developing country can be crowded out or displaced by the growth of similar exports from competing developing countries. If this is true, then the quantity of one country's manufactured exports should be inversely related to the quantity of other developing countries' exports, after controlling for relative price and income effects. One advantage of pursuing this quantitative approach is that the quantitative data, unlike the price data, are available at more disaggregated levels, allowing us to explore the presence of crowding out effects down to the two-digit SITC level.

To test this hypothesis, we specify the following empirical model:[12]

$$X_{it} = a_0 + a_1 Z_{it}^N + a_2 R_{it}^N + a_3 X_{it}^L + e_{it} \qquad (1)$$

where X_{it} is the volume of exports of manufactured goods from country i at time t, Z_{it}^N is total real expenditures on imports of manufactured goods by the industrialized countries, $R_{it}^N = P_{it}^N / P_{it}$ is the relative price of domestically produced manufactured goods in the industrialized countries (measured by the index P_{it}^N) to country i's own export price index (P_{it}), X_{it}^L is an index of the volume of exports from other developing countries that compete with exports from each country i and e_{it} is the error term. The FOC-quantity or quantitative displacement hypothesis implies $a_3 < 0$.

[Table 2 about here]

Table 2 summarizes the results of estimating equation (1) for the period 1984-2004 using a sample of 22 developing countries and 13 industrialized countries, with all data measured in natural logarithms.[13] In estimating equation (1), we used an autoregressive distributed lag specification with one lag each of the dependent and

independent variables, i.e., ARDL (1,1). The long-run coefficients reported in Table 2 were derived by dividing the sum of the current and lagged coefficients for each variable by one minus the coefficient on the lagged dependent variable. The results in the first column (for the 'ALL' panel) show evidence of crowding out at the aggregated level including all developing countries in the sample. The estimates for the other panels, which are disaggregated by industry (SITC categories), suggest that displacement effects (negative coefficients on X^L) are strongest in categories 6, 8 and associated sub-categories, but they are also found in category 7, which includes some of the products that, due to their relatively high-tech nature, have traditionally been considered to be relatively immune to cut-throat competition. This may be explained by two factors. First, the term 'high-tech' may be misleading as a substantial proportion of the production falling under these categories consists of labor-intensive assembly operations requiring relatively few skills and exhibiting relatively low barriers to entry. Second, and on a related note, a number of developing countries have established a presence in the sectors classified under SITC 7, owing in no small measure to the vertical disintegration of global production processes.[14] Thus, some of the SITC categories traditionally seen as relatively high-tech may not be immune to what Kaplinsky (1993) has called the commoditization of manufactures.

Alternative estimates of this model, which are not shown here for reasons of space,[15] yield additional insights into where and when the greatest displacement effects are found. Dividing the industrialized countries into three blocs—the US, EU and Japan—reveals that crowding out effects are significant only in the US market, which is also the largest destination. Splitting the sample period into two halves shows that the

crowding out coefficient is statistically significant only for the second half of the sample

period, 1994-2004. Notably, this period includes the formation of the North American

Free Trade Agreement, the creation of the World Trade Organization (WTO) and the rise

of China as a major exporting power (as well as China's accession to the WTO in 2001).

Furthermore, the results suggest the presence of a 'China effect' in the sense that the

crowding out coefficient turns statistically insignificant once the effects of Chinese

export competition are excluded from the sample.[16] This China effect seems to exert the

most influence in SITC 7, where displacement effects become insignificant both at the

one- and two-digit SITC levels once China is excluded.

Price competition (FOC-price)

A second approach is to test for the existence of significant relative price effects

on export demand, indicating a high degree of substitutability between manufactures

produced in different developing nations. This requires estimating an export demand

function in which, as discussed earlier, we distinguish relative prices or real exchange

rates with the industrialized countries and with competing developing countries:

$$X_{it} = b_0 + b_1 Z_{it}^N + b_2 R_{it}^N + b_3 R_{it}^L + u_{it} \tag{2}$$

where $R_{it}^L = P_{it}^L / P_{it}$ is the relative price of manufactured exports from competing

developing countries (measured by price index P_{it}^L) to home country exports of

manufactures (with price index P_{it}),[17] u_{it} is the error term and all other variables are

defined as before. In this specification, the FOC-price hypothesis of strong substitution

effects between developing country exports implies $b_3 > 0$.

When estimating equation (2), in order to ensure that changes in export prices

reflect those of manufactured exports, only those developing countries for which manufacturing exports constituted at least 70 percent of total exports in at least one of two years, 1990 and 2001, were included in the sample. This gave us a sample of 18 developing countries plus the 10 largest importing industrialized countries.[18] Although we could not obtain disaggregated price indexes for different types of exports, we were able to group the developing countries into several different panels according to their structural characteristics including their export composition (see Table 3). Some of these panels (country groups) were motivated more by considerations related to testing the FOC-growth hypothesis rather than FOC-price, but for the sake of consistency the same panels were used for both sets of estimates.

[Table 3 about here]

The panel 'ALL' includes all 18 developing countries in the sample. We then classified any country with a trade share in GDP of greater than 50 percent and a GDP of less than US$100 billion in the SMALLOPEN panel and put all other countries in the LARGE panel. An alternative criterion that could be used to select the developing countries in the sample is manufactured exports measured as a percentage of GDP, rather than as a percentage of total exports. We therefore divide the panel into two sub-panels of countries that are above and below a 25 percent threshold for this indicator, referred to as HIMFRGDP and LOMFRGDP, respectively. We expect FOC-price effects to be stronger in the SMALLOPEN and HIMFRGDP panels compared with LARGE and LOMFRGDP, respectively. Another possible classification is one based on the nature of a country's exports. We designated countries with 30 percent high technology exports or above in 2000 as 'high-technology' (HITECH) exporters and those with less than 10 percent as

'low-technology' (LOTECH) exporters;[19] China and Mexico were included in both

panels because of their intermediate status (they each had approximately 20 percent high

technology exports in 2000 and in each case this share rose rapidly in the 1990s) and on

the assumption that they compete with countries in both groups. We expect that the FOC

hypothesis is more likely to apply to countries that are specialized in less technologically

sophisticated, more 'commoditized' exports, such as textiles and apparel. Finally, we

distinguish between countries based on their external debt-to-GDP ratios using a 33

percent cut-off for the debt to GDP ratio, resulting in the two panels HIDEBT and

LODEBT. This gives us a total of eight sub-panels consisting of more structurally

homogeneous countries, as compared with the whole sample in the ALL panel.

[Table 4 about here]

Table 4 shows the results of estimating equation (2). As before, we used an

ARDL(1,1) specification and all variables were measured in natural logarithms; long-run

coefficients were calculated the same way as in Table 2.[20] In general, the results indicate

that the developing country exporters in our sample mainly compete with each other, and

not with domestic producers in the industrialized countries (this can be observed from the

positive coefficients on R^L compared with the mostly negative coefficients on R^N in most

of the panels shown in Table 4). The main exceptions are the LOMFRGDP and LOTECH

panels. While we don't have strong prior expectations about the LOMFRGDP panel, the

negative sign for R^L for the LOTECH panel is contrary to our priors—we would have

expected exporting developing countries specialized in low technology manufactures to

face more competition from other developing countries, not less, as we originally found

in Razmi and Blecker (2008). In that earlier article (in which the sample period covered

only 1983-2001), we found that the LOTECH countries mainly competed with other

developing countries, while the HITECH countries mainly competed with industrial

country producers. A result that is more consistent with expectations is that the

expenditure elasticity (coefficient on Z^N) is highly positive and significant for the

HITECH countries, but negative and statistically insignificant for the LOTECH countries.

Output effects (FOC-growth)

To test for effects of intra-developing country competition in export markets on

the growth of output, we estimate an econometric model that incorporates the same

independent variables as in the export equation (2) but also controls for net financial

inflows:[21]

$$\hat{Y}_{it} = c_0 + c_1 \hat{Z}_{it}^N + c_2 \hat{R}_{it}^N + c_3 \hat{R}_{it}^L + c_4 \hat{F}_{it} + v_{it} \tag{3}$$

where $\hat{Y}_{it}$ is the growth rate of real domestic output in country i at time t, $\hat{F}_{it}$ is the

growth rate of real capital inflows (measured as a percentage of GDP) into country i at

time t and v_{it} is the error term. All other variables are defined as before, except that ^'s

are used to indicate growth rates (measured as log differences).

We expect the expenditure effect c_1 and the financial inflows effect c_4 to be

positive, while the signs of the relative price (real exchange rate) effects c_2 and c_3 are

theoretically ambiguous as they depend on the degree to which the products of different

countries are substitutes. The FOC-growth hypothesis rests on the assumption that

developing countries' manufactured exports are close substitutes for each other, and that

sales in the same industrialized country markets imply the possibility of mutual crowding

out. Such crowding out can restrain the growth of exports and, in the presence of a

balance of payments constraint, the growth of output as well. If these effects are significant, we would expect $c_3 > 0$, otherwise $c_3 \leq 0$.

This leaves the sign of c_2, which is the effect of a real depreciation of the home currency relative to the industrialized countries' currencies on the home country's growth rate. Although we hypothesize that the substitution effects of relative price changes are likely to dominate other effects when developing countries devalue relative to each other, if developing country manufactures do not compete to a significant extent with industrialized country products, then other channels may assume added importance when developing nations devalue relative to industrialized countries.[22] For example, recent studies have emphasized balance sheet effects. If a developing country's foreign debt is mostly denominated in industrialized country currencies, then a real devaluation relative to these countries could have a contractionary effect as the country suddenly has to scrounge for further resources to deal with the inflated debt burden. Also, many developing countries are dependent on industrialized countries for capital goods and equipment. A devaluation relative to those countries, by rendering these critical goods harder to buy, could have a negative impact on output. For these and other reasons, a real devaluation vis-à-vis industrialized countries may depress national income, as has been recognized in the large literature on contractionary devaluations.[23] In that case, $c_2 < 0$, which (following Blecker and Razmi, 2008) we call the 'COD' (for contractionary devaluation) hypothesis. In the alternative case, $c_3 \geq 0$.

The estimates of equation (3) are summarized in Table 5, using the same panels of countries as in Table 4 (except that Hong Kong is omitted for lack of financial inflow data). The model is estimated in ARDL(1,1) form and only long-run coefficients are

reported in the table as before. The estimates in Table 5, however, use different price measures: instead of the export price indexes used in the regressions in Tables 2 and 4, the regressions in Table 5 use consumer price indexes to adjust nominal exchange rates in calculating real exchange rates (results using the export price indexes, which are generally similar but suffer from certain econometric problems, are reported in Blecker and Razmi, 2008). The results in Table 5 reveal significant COD effects (i.e., negative coefficients on $\hat{R}^N$) in all of the panels shown and significant FOC-growth effects (i.e., positive coefficients on $\hat{R}^L$) in most of them. FOC-growth effects are strongest for the SMALLOPEN and LOTECH panels, but they were also found to be statistically significant in most of the other panels. As expected (based on the balance sheet effects discussed above), COD effects are stronger in HIDEBT panel compared with LODEBT. The only anomaly in these results is the negative coefficient on $\hat{R}^L$ for the HIMFRGDP panel, which in principle might be expected to have a relatively strong FOC-growth effect.

[Table 5 about here]

These findings suggest that the expanding group of developing countries that are pursuing an export-led growth strategy may face a dilemma. If any given exporting nation becomes more price-competitive in global export markets relative to competing developing nations (whether through a nominal currency depreciation, wage cuts, or other cost reductions), that country may obtain short-run growth benefits, but these are offset to the extent that its real exchange rate also depreciates relative to the industrialized countries at the same time. If other developing nations match the lower prices, then the competitive benefits vis-à-vis those nations are lost, while the contractionary effects of

the depreciation relative to the industrialized countries are then felt by all the developing countries involved. Also, if a rival developing country cheapens its exports of manufactures and the home country is unable to match this depreciation, the latter may experience a growth slowdown due to the FOC-growth effect (there will not be a COD effect in the home country in this situation).

Conclusions and future prospects

In a recent newspaper editorial, Dani Rodrik writes that 'there are signs that we are at the cusp of the transition to a new regime in which the rules of the game will not be nearly as accommodating for export-led strategies' (Rodrik, 2008). The reasons he cites for this prediction are the growth slowdown in the advanced economies associated with the financial crisis of 2007-8, the likely unwinding of global current account imbalances, and the threat of increased protectionism in the advanced countries. While these potential obstacles to future export-led growth are real, the research cited in this chapter shows that the export-led growth model already suffered from a significant internal contradiction even before these new problems arose. While such a model could work well for a small number of countries without too many competitors, such as the four Asian tigers in the 1970s and 1980s, the diffusion of the model to a *large* number of countries in the 1990s and 2000s made it likely that together they would face an adding-up constraint or FOC.

The econometric estimates discussed in this chapter find evidence in support of three variants of the FOC hypothesis. First, we found evidence of significant quantitative displacement of manufactured exports from some developing countries by similar types

of exports from other developing countries. Second, we found that exports from different developing countries are strong substitutes for each other, in the sense that price competition over market shares in the industrialized countries enables the developing countries with relatively lower-priced exports to succeed at the expense of others. Third, and most strikingly, we found that developing countries obtain significant growth benefits by maintaining low real exchange rates relative to competing developing countries, in spite of the fact that real depreciations relative to the industrialized countries have contractionary effects. This suggests that the export-led growth model was not a panacea for many developing nations even under the more favorable global conditions that prevailed prior to 2008.

If industrialized country markets do not grow rapidly enough, even in prosperous times, to accommodate all of the desired increases in manufactured exports from the developing countries, one of the obvious solutions is to increase 'South-South' or intra-developing country trade. Such trade has grown rapidly in recent years, especially in Asia (less so in other global regions). One recent study (Akin and Kose, 2008) finds that the more advanced emerging market nations have begun to 'decouple' from the industrialized nations in the sense that the impact of Northern economic activity (GDP growth) on the growth of what they call 'the emerging South' was reduced during the 1986-2005 period compared with earlier years. Nevertheless, the impact of Northern growth on the emerging South economies remains positive and significant after 1986, implying that the latter countries are not immune from a growth slowdown in the North. Moreover, regionally disaggregated results show that this apparent (and partial) 'decoupling' is found only in the Asia-Pacific region, while in Latin America and the

Caribbean the effect of Northern growth becomes larger and more significant after 1986, and for the 'developing South'—i.e., the less developed nations—the effects of Northern growth remain strong and there is no structural break after 1986.[24] Thus, although the Asia-Pacific region has become relatively less dependent on Northern growth than in the past, it and all other parts of the 'developing' and 'emerging' South remain significantly constrained by the growth of their primary export markets, which continue to be located mainly in the advanced industrial economies. Finally, one should note that a significant part of South-South trade consists in the exchange of intermediate goods for further assembly, and to this extent Southern exports still depend ultimately on final consumer demand in the North (see Athukorala, 2008).

Our analysis thus leads inexorably to the conclusion that, for most developing or emerging nations, the path toward sustainable long-run development must emphasize internal markets and domestic demand much more than it has during the ascendancy of export-led strategies in the past few decades. Although those strategies produced several notable success stories in Asia, it does not appear feasible for all countries in the developing world to emulate their success—and if it was not feasible even during the years of relatively rapid global growth in the 1990s and mid-2000s, it will be even less so in the aftermath of the global financial crisis of 2008. Perhaps one of the few silver linings of the latter will be the impetus it may give to a rethinking of development strategy, in the direction of a better balance of internal and external sources of demand, rather than the extreme pendulum swings of the import-substitution and export-promotion eras. Such a redirection of development policy may also permit a return to growth with equity, as labor income becomes seen as a crucial element of aggregate demand and not

merely a cost to be minimized in the interest of external competitiveness.

Notes

[1] See Razmi (2007b) and Razmi and Blecker (2008) for more detailed statistics.

[2] For surveys covering a wide range of studies see Blecker (2002, 2003), Mayer (2002), and Blecker and Razmi (2008).

[3] The idea of using US import data to calculate terms of trade for developing country exports is due to Maizels (2000). The data shown in this figure are not available prior to 1991 on a comparable basis from the source used here.

[4] Of course, the implication that ought to have been derived is that real exchange rate overvaluations would constitute a beneficial development policy objective, but, as pointed out by Williamson (2008), this implication was seldom or never translated into a serious policy recommendation.

[5] See McCombie and Thirlwall (2004) for a collection of the main contributions.

[6] The extended model including capital mobility is presented in the unpublished theoretical appendix to Blecker and Razmi (2008), which is available from the authors on request.

[7] The result does not appear to hold for developed countries.

[8] Other papers that have recently explored the real exchange rate-growth nexus include Aguirre and Calderón (2005), Prasad *et al*. (2007), Johnson *et al*. (2007), Eichengreen (2007), Williamson (2008), Frenkel and Ros (2006), and Montiel and Serven (2008).

[9] These indexes use a dual weighting scheme previously utilized in Razmi and Blecker (2008) which, in spite of the common publication date, was written earlier.

[10] This literature originated with classic articles by Díaz-Alejandro (1963) and Krugman and Taylor (1978). For references to more recent literature as well as new empirical tests, see Razmi (2007a) and Blecker and Razmi (2008). It should be noted that the possibility of a devaluation being contractionary does not depend on short-run "J-curve" effects, in which the trade balance initially worsens and then eventually improves following a devaluation. Even if the J-curve eventually turns up and the trade balance improves, a devaluation can still be contractionary if the increase in the trade balance is offset by other consequences of the devaluation, such as the balance sheet effects discussed below.

[11] This section draws on the authors' previously published findings in Razmi (2007b) and Blecker and Razmi (2008), and also presents updated and revised estimates similar to those in Razmi and Blecker (2008). For reasons of space, our discussion here is limited to the main panel data results. Readers are referred to the original articles for details of the

index construction, sample selection criteria, individual country estimates, and sensitivity tests.

[12] See Razmi (2007b) for the underlying theoretical specification of export demand that implies equation (1) as a method of testing for quantitative displacement. We ignore lags here in order to focus on the main motivation behind the specification; the lag structure is discussed below.

[13] The developing countries, which were chosen because of the relatively high percentage of manufactures in their exports, are: Bangladesh, Brazil, China, Costa Rica, Hungary, India, Indonesia, Jordan, Korea (Rep.), Malaysia, Mauritius, Mexico, Morocco, Pakistan, the Philippines, Poland, South Africa, Sri Lanka, Taiwan, Thailand, Tunisia, and Turkey. The industrialized countries, which were chosen because of their size, are: Austria, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, the UK, and the US.

[14] Notice that SITC 7 is also the category in which the growth of global production networks and vertical intra-industry trade was the most rapid during this period. See, for example, Lall *et al.* (2004) and UNCTAD (2004).

[15] See Razmi (2007b) for complete results.

[16] Both the China effect and the importance of the US market as a locus of competition are corroborated by other recent studies. For example, Arnold (2008) finds that a large part of the increase in Chinese imports into the US has come at the expense of imports from other Asian countries, rather than US domestic products. However, Hanson and Robertson (2008) find only a small impact of Chinese exports on exports of other developing countries using a gravity model. Also, Wang and Wei (2008) find evidence of increasing similarity of Chinese exports to domestic products in the US and other advanced economies.

[17] See Razmi and Blecker (2008) and Blecker and Razmi (2008) for more details on how these price indexes were constructed and how the empirical model maps onto the theoretical framework alluded to in note 6, above.

[18] These 18 developing countries are Bangladesh, China, the Dominican Republic, Hong Kong, India, Jamaica, South Korea, Malaysia, Mauritius, Mexico, Pakistan, the Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Tunisia and Turkey; the 10 largest industrialized countries are Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Switzerland, the UK and the US.

[19] These panels largely correspond to the percentages of the countries' exports in the four major SITC classifications for manufactures. Especially, the countries that export largely products in SITC 7, which includes electronics, computers, automobiles and other types of machinery and equipment, are all in the HITECH category. In contrast, the countries whose exports are mostly in SITC 6 (mainly textiles and steel) and 8 (mostly apparel and footwear) are all in the LOTECH group.

[20] Thus, the underlying specification is of a log-linear Cobb-Douglas form, which assumes that developing countries export products that are imperfect substitutes.

[21] This empirical specification was used previously in Blecker and Razmi (2008) and is inspired by the theoretical models of Blecker (2002) and Razmi (2004), discussed earlier.

[22] See Razmi (2007a) and Blecker and Razmi (2008) for more detailed discussions of these other channels.

[23] Another reason is that a devaluation tends to redistribute income away from labor, thereby reducing consumer demand. See the sources cited in note 10, above.

[24] The countries included in Akin and Kose's 'emerging South' are Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela, China, Hong Kong, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Singapore, Thailand, Turkey, Egypt, Israel, Jordan, Morocco, and South Africa. These are largely the same countries we have included in this study as the developing nations most specialized in manufactured exports, with only a few exceptions (compare notes 13 and 18, above).

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Table 1. *Average annual growth rates, selected countries and years*

	1980-89	1990-99	2000-07
Asian newly industrialized economies (four tigers)[a]	7.7	6.1	4.9
China (People's Republic)	9.7	10.0	10.0
India	5.6	4.6	7.1
Other emerging and developing economies specialized in manufactures[b]	3.8	4.2	4.5
Average for all emerging and developing economies (excluding the four tigers)	3.5	3.2	6.4

Source: International Monetary Fund, *World Economic Outlook,* October 2008 Database, http://www.imf.org/external/pubs/ft/weo/2008/02/weodata/index.aspx, and authors' calculations.

Notes: Averages are calculated using GDP at purchasing power parity as weights.

[a] Republic of Korea, Taiwan Province of China, Hong Kong, and Singapore.

[b] Bangladesh, Dominican Republic, Jamaica, Malaysia, Mauritius, Mexico, Pakistan, Philippines, Sri Lanka, Thailand, Tunisia, and Turkey. These are the twelve other countries, besides China, India, and the four tigers, for which manufactures constituted more than 70% of their merchandise exports in either 1990 or 2001.

Table 2. *GMM estimates of export equation (1), tests for FOC-quantity. Sample period after lags and differences, 1987-2004*

Dependent Variable: Real exports, X										
Panel	ALL	SITC 5	SITC 6	SITC 7	SITC 8	SITC 65	SITC 75	SITC 77	SITC 84	SITC 85
Cross-Sections	22	22	22	22	22	22	22	22	22	22
Total panel observations	390	390	390	390	390	390	388	390	390	390
Long-run coefficients on:										
Z^N	2.383	-0.755	2.841	3.887	0.677*	1.244	5.240	3.412	3.219	-0.356
	(0.004)	(0.029	(0.000)	(0.000)	(0.169)	(0.000)	(0.000)	(0.000)	(0.001)	(0.060)
R^N	1.774	1.492	0.842	1.819	1.301	2.671	2.633	1.312	3.808	4.051
	(0.081)	(0.000)	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)
X^L	-0.699	1.257	-1.486	-0.791	-0.896	-1.657	-0.945	-0.561	-2.534	-3.174
	(0.081)	(0.000)	(0.000)	(0.001)	(0.040)	(0.000)	(0.014)	(0.060)	(0.003)	(0.000)
Sargan test (*p*-value)	0.589	0.497	0.545	0.367	0.610	0.561	0.525	0.357	0.737	0.784

Source: Razmi (2007b), reproduced with permission.

Notes: *p*-values in parentheses, based on White period standard errors and variance (degrees of freedom corrected). Constants and lagged dependent variables were included in all equations. The reported coefficients are the 'long-run' coefficients, i.e., the sums of the current and one-year lagged variables divided by one minus the coefficient of the lagged dependent variable. Second and third lags of the dependent variable and lagged instances of the regressors were used as instruments. Period SUR weighted matrices were used to correct for both period heteroskedasticity and general correlation of observations within cross-sections. Orthogonal deviations were used to remove individual specific effects. The Sargan test is for the validity of overidentifying restrictions. SITC 65 includes textile yarn, fabrics, made-up articles and related products, SITC 75 includes office machines and automatic, data-processing machines, SITC 77 includes electrical machinery, apparatus and appliances, SITC 84 includes articles of apparel and clothing accessories, SITC 85 includes footwear.

*Denotes variables that were not significant at the 10% level, but which were included based on Wald tests for joint exclusion.

Table 3. *Countries included in the panels for testing FOC-price and FOC-growth*

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ALL: Bangladesh, China, Dominican Republic, Hong Kong,[a] India, Jamaica, Korea,
    Malaysia, Mauritius, Mexico, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan,
    Thailand, Tunisia, Turkey

SMALLOPEN (total trade share of GDP over 50% and GDP less than US$100 billion in
    2000): Dominican Republic, Hong Kong,[a] Jamaica, Malaysia, Mauritius, Philippines,
    Singapore, Sri Lanka, Tunisia

LARGE (total trade share of GDP under 50% or GDP greater than US$100 billion in 2000):
    Bangladesh, China, India, Korea, Mexico, Pakistan, Taiwan, Thailand, Turkey

HIMFRGDP (ratio of manufactured exports to GDP greater than 25%): Hong Kong,[a] Korea,
    Malaysia, Mauritius, Philippines, Singapore, Taiwan, Thailand

LOMFRGDP (ratio of manufactured exports to GDP less than 25%): Bangladesh, China,
    Dominican Republic, India, Jamaica, Mexico, Pakistan, Sri Lanka, Tunisia, Turkey

HITECH (share of high technology imports greater than 30%): China,[b] Hong Kong,[a] Korea,
    Malaysia, Mexico,[b] Philippines, Singapore, Sri Lanka, Taiwan

LOTECH (share of high technology imports less than 10%): Bangladesh, China,[b] Dominican
    Republic, India, Jamaica, Malaysia, Mauritius, Mexico,[b] Sri Lanka, Tunisia, Turkey

HIDEBT (ratio of external debt to GDP greater than 33%): Bangladesh, Dominican Republic,
    Jamaica, Malaysia, Mauritius, Mexico, Pakistan, Philippines, Sri Lanka, Thailand,
    Tunisia, Turkey

LODEBT (ratio of external debt to GDP less than 33%): China, Hong Kong,[a] India, Korea,
    Singapore, Taiwan

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Notes:

[a] Hong Kong is omitted from all regressions in the tests of FOC-growth in Table 5, below,
because of a lack of foreign capital inflow data prior to 1999, but it is used in the FOC-price
tests in Table 4.

[b] China and Mexico are included in both HITECH and LOTECH due to their intermediate
status, with high technology shares around 20% and rising during the sample period.

Table 4. *GMM estimates of export equation (2), tests for FOC-price. Sample period after lags and differences, 1987-2004*

Dependent Variable: (Logged value of) real exports, X									
Panel	ALL	SMALLOPEN	LARGE	HIMFRGDP	LOMFRGDP	HITECH	LOTECH	HIDEBT	LODEBT
Cross-Sections Included	18	9	9	8	10	9	11	12	6
Total panel observations	336	165	171	146	190	165	209	222	114
Long-run coefficients on:									
Z^N	0.780	0.383	1.124	1.879	-0.122	1.109	-0.137	0.199	0.527
	(0.033)	(0.148)	(0.000)	(0.000)	(0.000)	(0.000)	(0.458)	(0.492)	(0.000)
R^N	-0.730	-0.669	-0.764	-3.757	2.524	-4.024	2.523	0.215	-1.474
	(0.211)	(0.355)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.756)	(0.000)
R^L	2.456	3.126	1.901	6.468	-1.562	4.918	-1.456	1.285	1.940
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.023)	(0.000)
Sargan test (*p*-value)	0.105	0.568	0.771	0.809	0.386	0.327	0.233	0.276	0.699

Source: Authors' calculations.

Notes: Same as for Table 2, except that the panels used here are the ones described in Table 3.

Table 5. *GMM estimates of output equation (3), tests for FOC-growth and COD. Sample period after lags and differences, 1987-2004*

Dependent Variable: Growth rate (log difference) of real GDP, $\hat{Y}$

Panel	ALL	SMALLOPEN	LARGE	HIMFRGDP	LOMFRGDP	HITECH	LOTECH	HIDEBT	LODEBT
Cross-Sections Included	17	8	9	7	10	8	11	12	5
Total panel observations	297	142	155	124	173	191	142	209	89
Long-run coefficients on:									
$\hat{Z}^N$	0.122	0.122	0.118	0.111	0.059	0.221	0.039	0.073	0.118
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.021)	(0.000)
$\hat{R}^N$	-0.337	-0.376	-0.165	-0.301	-0.167	-0.121	-0.174	-0.272	-0.128
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\hat{R}^L$	0.165	0.202	0.134	-0.212	0.086	-0.093	0.110	0.105	-0.086*
	(0.008)	(0.000)	(0.000)	(0.000)	(0.001)	(0.011)	(0.003)	(0.002)	(0.198)
$\hat{F}$	0.579	0.190	1.226	0.370	0.258	0.790	0.217	0.501	0.152
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.003)
Sargan test (*p*-value)	0.208	0.593	0.806	0.681	0.402	0.737	0.375	0.117	0.690

Source: Blecker and Razmi (2008), reproduced with permission.

Notes: Same as for Table 2, except that the panels used here are the ones described in Table 3.
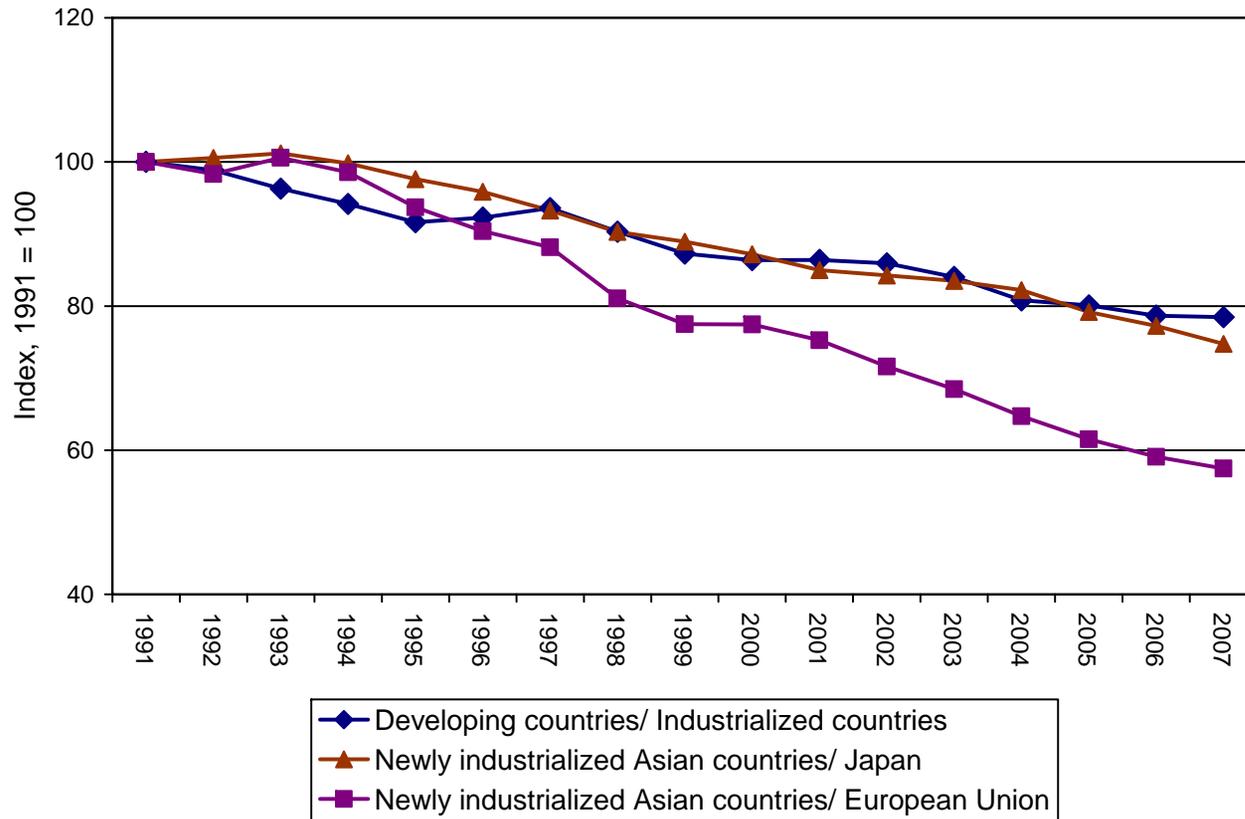
Figure 1. *Indexes of relative prices of manufactured goods imported by the US, annual averages, 1991 to 2007. Source: US Department of Labor, Bureau of Labor Statistics, Import Price Indexes, www.bls.gov, and authors' calculations. Note: the price indexes are for manufactured imports only, except the index for the newly industrialized Asian countries is for total imports.*