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Policy Failures and Growth Miracles

No testimony is sufficient to establish a miracle,
unless the testimony be of such a kind that its falsehood would
be more miraculous than the fact which it endeavors to establish.

—David Hume, *An Enquiry Concerning Human Understanding*

The worth of any policy or variable is the extent to which it can explain success and failure. The previous chapters show how currency undervaluation can help explain investment and growth. However, some nagging questions remain regarding the conclusion that a country can undervalue its way to prosperity. First, currency undervaluation does not explain high growth in various studies that are based almost exclusively on the Dollar-Easterly measure of currency valuation (see chapter 4). Second, some models that did support the relationship between currency undervaluation and growth—focusing on export-led growth strategy as an indirect and somewhat inefficient form of currency undervaluation—did so only when outliers were included in the model, calling into doubt the role of currency valuation as a determinant of growth. Third, deliberate currency undervaluation, even assuming it worked, is often considered subservient to the real determinant of high growth: effective institutions. And finally, Michael Woodford (2009) shows that there is "construction bias" in traditional measures of currency valuation.

Previous chapters present evidence that addresses these points. Most important, chapter 4 discusses how traditional measures of currency undervaluation contain significant measurement errors, and how this makes the noise-to-signal ratio of these measures high. It is no surprise, therefore, that the use of these measures has led to an underestimation of the importance of undervaluation as a determinant of growth. When we correct for a large part of the measurement error through the use of a better functional form between two given variables—in this case, the real exchange rate and income per capita—we see that exchange rate policy does matter. And it matters even more when policy is represented by two variables rather than one—both the initial level of currency undervaluation (to signal the relative cheapness of investment) and

the change in the level of valuation (to signal the directional change in the profitability of investment). Both variables affect investment behavior and do so with differing impact. Through these relationships, we see that currency undervaluation affects growth via investment.

This chapter subjects the link between currency valuation and growth to further tests. In particular, I examine whether currency misalignments play a role in growth changes.

Growth Successes and Failures

There have been some conspicuous growth successes and failures, and four reports analyze these in some detail. The first is the pioneering study by the World Bank (1993) on the East Asian "miracle." The second is the article by Ricardo Hausmann, Lant Pritchett, and Dani Rodrik (2005) documenting the determinants of growth acceleration in a sample of more than 80 countries.[1] The third is by Leszek Balcerowicz and Stanley Fischer (2006), who use a case study approach to examine growth in several developed and developing economies, and in particular the transition economies of Eastern Europe. The fourth, from the Commission on Growth and Development (2008) of the World Bank, identifies13 countries whose growth performance could be defined as extraordinary—that is, an average annual GDP growth above 7 percent for a continuous period of 25 years. Members of this distinguished club include Japan from 1950 to 1983, Brazil from 1950 to 1980, and Thailand from 1960 to 1997.

Another contribution to this group is not a study but the hypothesis that growth slows once a country's income per capita enters a "middle income range" (see Gill and Kharas 2007; Eichengreen, Park, and Shin 2011). This is often referred to as the middle income trap. An alternative explanation is that growth slows partly because of advanced catch-up. For example, in 2000 at an income per capita of close to $1,000, China had a catch-up growth advantage of approximately 1.5 percent per year. In 1980, this catch-up factor was 2 percent, but by 2011, it had declined to 0.8 percent. The implication is that China's annual growth rate can be expected to be lower by 1 percent per year than the growth rates from just a decade ago. In other words, catch-up may help explain the middle income trap.

Another factor, besides advanced catch-up, may be contributing to declining growth rates and therefore to the perception that there exists a middle income trap. With accelerated growth, there is an increase in capital flows, which causes the currency to become either overvalued or less undervalued. In either event, the GDP growth rate will tend to decline, as described in chapter 6. Overall, then, the middle income trap can be said to exist only if there remains a systematic tendency for growth rates to slow after controlling for catch-up and overvaluation effects.

1. Also worthy of mention is Rodrik (2003a), which provides background material for Hausmann, Pritchett, and Rodrik (2005).

Explanations for Failure

The World Bank (1993) report attributes the East Asian miracle primarily to these countries' pursuit of an export-push strategy geared toward opening up their economies (trade liberalization) and allowing their exchange rates to remain competitive. This policy is described by the World Bank (1993, 115) as having maintained for Hong Kong "a stable and at times slightly undervalued exchange rate vis-à-vis the US dollar"; and for the high-performance Asian economies (HPAE) as having "avoided the severe depreciation that beset sub-Saharan Africa and Latin America" (p. 114). The overall assessment is that

> several HPAE governments used exchange rate policies to offset the adverse impact of trade liberalizations.... [S]ome used deliberately undervalued exchange rates to assist exporters. In these instances, exchange rate policy and fiscal and monetary tools to carry it out became a part of an overall export-push strategy. (p. 125)

In essence, the report concludes that growth miracles come about via export-led growth, a view endorsed by many economists, prominent among them Béla Balassa (1978) and Anne Krueger (1990). But the report suggests that export-led growth is possible without any undervaluation of the currency. It is worth quoting this somewhat radical conclusion in some detail:

> The export-push strategy appears to hold great promise for other developing economies. Fortunately, many powerful instruments of export promotion are not only within the institutional capacity of many developing economies but remain viable in today's economic environment. Creating a free trade environment for exporters, providing finance and support services for small and medium-size exporters, improving trade-related aspects of the civil service, aggressively courting export-oriented foreign direct investment, and focusing infrastructure on areas that encourage exports are all attainable goals that are unlikely to provoke opposition from trading partners. Indeed, some or all of these have been part of the export push in Indonesia, Malaysia, and Thailand. These three economies, the most recent participants in the "economic miracle," may show the way for the next generation of developing economies to follow export-push strategies. (World Bank 1993, 25)

Several scholars criticized the World Bank study on grounds of reverse causation—that is, higher trade and openness per se may have had little to do with the miracle of growth. Rodrik (2003b) discusses about a dozen growth miracles, among them some outside of East Asia and China such as Botswana and Mauritius. The study's conclusion is simple: Growth miracles occur because of "institutions":

> Institutions that provide dependable property rights, manage conflict, maintain law and order, and align economic incentives with social costs and benefits are the foundation of long-term growth. This is the clearest message that comes across from the individual cases. (Rodrik 2003b, 10)

Hausmann, Pritchett, and Rodrik (2005) do not study economic miracles but rather cases of extreme growth acceleration from a reasonably low base. They use three criteria: Growth per capita is rapid (above 3.5 percent per year); growth accelerates by at least 2 percent per year for at least eight years; and output after the growth acceleration period exceeds the pre-episode peak. There is a conflict in the study between the hypothesis that exchange rate depreciation matters and the empirical finding that it does not. The abstract states that "growth accelerations tend to be correlated with increases in investment and trade, and with real exchange rate depreciations," but a later passage states, "If we look at these same variables during the eight-year growth acceleration, instead of just around the start of the process we find similar results except for the real exchange rate.... [R]eal exchange rate changes are no longer statistically different from zero" (p. 317). The authors are quite candid about their failure to find any positive correlations:

> Growth accelerations tend to be highly unpredictable: the vast majority of growth accelerations are unrelated to standard determinants and most instances of economic reform do not produce growth accelerations.... [S]ustained and unsustained growth accelerations tend to be triggered by different conditions.... [M]ost growth accelerations are not preceded or accompanied by major changes in economic policies, institutional arrangements, political circumstances, or external conditions.... [I]t would appear that growth accelerations are caused predominantly by idiosyncratic, and often small-scale, changes. The search for the common elements in these idiosyncratic determinants—to the extent there are any—is an obvious area for further research. (Hausmann, Pritchett, and Rodrik 2005, 303, 327–28)

Balcerowicz and Fischer (2006, 4) conclude that in Europe and the transitional economies of Eastern Europe "reliance on market forces within an open economy in a stable macroeconomic environment, with assured property rights, are the keys to rapid economic growth."

A recent addition to the literature by the Commission on Growth and Development (2008) reaches the same conclusions as the four mentioned here. Possibly reflecting the fact that the document was written by a committee, this voluminous and exhaustive study makes no mention of real currency depreciation as a determinant of growth. What did make possible the exceptional growth witnessed in 13 countries from Botswana to Oman to Japan to China over the last 50 years? According to the report, there were five major factors: The successful countries "fully exploited the world economy...maintained macroeconomic stability...mustered high rates of saving and investment... let markets allocate resources...[and] had committed, credible, and capable governments" (p. 21).

The Gill and Kharas (2007) and Eichengreen, Park, and Shin (2011) studies focus on growth deceleration, or the middle income trap. They explain growth failures, or slowdowns, as follows.

> Rather than having to pioneer new technologies, late-developing countries can import knowhow from abroad. They can reap productivity gains simply by shifting workers from underemployment in agriculture to export-oriented manufacturing, where those imported technologies are utilized. With young generations engaged in saving enjoying higher incomes than elderly dissavers, they are able to finance high levels of investment.... Periods of high growth in late-developing economies do not last forever. Eventually the pool of underemployed rural labor is drained. The share of employment in manufacturing peaks, and growth comes to depend more heavily on the more difficult process of raising productivity in the service sector. A larger capital stock means more depreciation, requiring more saving to make this good. As the economy approaches the technological frontier, it must transition from relying on imported technology to indigenous innovation. (Eichengreen, Park, and Shin 2011, 1)

So what works? What can we conclude from the plethora of studies on the determinants of growth successes (and failures)? Taken at face value, these studies suggest that little is really known about growth, growth acceleration, or growth miracles. A stable economic environment (noted as one cause of high growth) is more likely an outcome than a determinant. Increased openness is a possible factor, but there is the problem of identification. In the absence of clear determinants, the explanation often centers on the presence or absence of Western-style institutions, particularly institutions dealing with property rights. Chapter 11 tests the conclusion that institutions positively affect growth, and finds it to be lacking—confidence in institutions is highly misplaced. Somewhat surprisingly, currency valuation is not explicitly discussed in any of these key studies on the factors for growth success or failure, although it often lurks in the background. For example, it is completely absent from the Commission on Growth and Development (2008) report. And while currency valuation is mentioned by Hausmann, Pritchett, and Rodrik (2005), they conclude that its contribution to sustained growth is fragile, at best.

Chapter 8 exhibited how currency valuation can explain systematic differences in growth rates. The remainder of this chapter explores whether currency valuation can explain growth accelerations and decelerations. Specifically, what level, or pattern, of currency undervaluation is indicative of a possibility of future growth acceleration?

Structural Breaks in Growth

This section reports on several econometric tests of growth acceleration, which are identical to those in Hausmann, Pritchett, and Rodrik (2005). They identify a growth break year—the year of a change in the trend of growth per capita—and determine whether the seven-year period after the break is significantly different from the seven years before. This is the definition used to estimate growth performance for the episodes include in the above five studies.[2]

2. Both Balcerowicz and Fischer (2006) and the Commission on Growth and Development (2008)

In addition, currency valuation is used to identify an additional type of break year, when the trend of currency valuation changes either toward undervaluation or toward overvaluation. The former is expected to have a positive effect on subsequent growth, the latter a negative effect. A simple formulation of trend change is when the three-year average of the level of valuation moves below the 33rd percentile of such averages. A break from above, toward undervaluation, is termed a negative break. A break from below, toward overvaluation, is identified according to the 50th percentile of the three-year average and is termed a positive break. (The data used to identify the break years are from Bhalla 2007a.)

The third type of break year is identified in the spirit of the Commission on Growth and Development (2008) study—namely, when a country's growth rate per capita begins to achieve a doubling in income levels in the minimum period of time (again using the dataset from Bhalla 2007a). For example, China's income per capita in purchasing power parity (PPP) terms has increased by 11 times since 1979. The first doubling took 12 years and ended in 1991; the second doubling took 10 years and ended in 2001; the third doubling took only 7 years and ended in the middle of 2008.[3] Therefore, the minimum period required for China to double its income per capita is seven years, and the break year is 2001. (The relationship between currency valuation and the minimum doubling time is explored below.)

The fourth type of break year is the year of maximum currency devaluation since 1950. According to the hypothesis that the real exchange rate is endogenous (see chapter 6), such devaluations cannot really work. An alternate hypothesis is explored here—namely, that such nominal devaluations also bring about a real devaluation and that such real devaluations help growth.

The fifth type of break year is identified to test the middle income trap hypothesis. The primary example is Brazil. Between 1970 and 1980, while the rest of the world was caught in the grips of stagflation, Brazil grew at an average rate per capita of 5.8 percent per year. In 1980, Brazil's income per capita was PPP$6,380 in 1996 prices (or PPP$17.5 per day). Between 1981 and 1990, when the rest of the world was booming, income per capita in Brazil grew at an average annual rate of –0.26 percent. While other explanations are possible, this drastic slowdown is most often cited as proof of the growth trap that awaits economies as income per capita exceeds $6,000 in 1996 prices, or about PPP$13,000 in 2011 prices. Here, middle income is defined to be income per capita per day between PPP$16 and PPP$32 in 1996 prices, or income per capita per year between PPP$12,700 and PPP$25,400 in 2011 prices. The break year is thus identified as the year when the three-year average rate of income per capita enters this range.

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use small datasets, especially if countries from Eastern Europe or the former Soviet Union are excluded.

3. In 2008, China's income per capita was PPP$8,704, in 1996 prices. In 2011, it was estimated at PPP$11,310. In 1979 income per capita was PPP$1,023; hence, 2011 income levels were almost 11 times the 1979 income levels.

A total of nine break years are considered: three for growth decelerations (one of which is for a currency overvaluation and two for middle income trap) and six for growth accelerations. These are used to test for the existence of a middle income trap and to see if currency valuations predict the future course of growth. This provides a rigorous test of whether, under varied circumstances, currency valuations matter for growth.

Explaining Growth Acceleration

What determines the difference in growth rates in the before and after acceleration periods? Table 9.1 presents the results on currency valuation changes and growth for each study and type of break year. Column 3 predicts the direction of growth change. As discussed, several datasets were constructed based on the existence of a growth spurt (e.g., Hausmann, Pritchett, and Rodrik 2005; Bhalla 2007a for income doubling). These yield an average growth acceleration of 4.7 percent per year. The dataset used to test the middle income trap (Bhalla 2007a) had an observed average growth decline of –3.8 percent. Four break years were identified with datasets constructed using the data in Bhalla (2007a), for currency undervaluation, currency overvaluation, the middle income threshold, and the year of maximum currency devaluation. The first three of these show almost no change in growth. The maximum devaluation break year does yield a high growth acceleration of 1.8 percent, but this is to be expected in part because the devaluations most likely occurred as a result of large current account deficits, a circumstance not normally associated with growth.

What is of interest is whether the change in currency valuation is associated with a change in growth rates. The growth rate in any seven-year period, *t*, can be represented as follows:

$$G_t = \alpha + \beta_1 *(iY_t) + \beta_2 \times (iCV_t) + \beta_3 \times dCV_t + \beta 4 \times Z_t + \varepsilon_t; \text{ and}$$

$$G_{t-1} = \alpha + \beta_1 \times (iY_{t-1}) + \beta_2 \times (iCV_{t-1}) + \beta_3 \times dCV_{t-1} + \beta 4 \times Z_{t-1} + \varepsilon_{t-1} \qquad (9.1)$$

where *G* is the growth rate of income per capita for the six years subsequent to the initial break year, *iY* is the log of income per capita in the initial year of the seven-year period, *CV* is the currency valuation in the initial year, *dCV* is the mean change in currency valuation, and *Z* is a vector of other determinants of growth.

The difference in the two equations, $G_t - G_{t-1}$, is the acceleration in growth rates. If the break year is *t*, then the "before" dataset is for (*t* – 8), and the *acceleration* for the *before* dataset is from (*t* –15) to (*t* – 8); the "after" dataset is from (*t* – 8) to (*t* + 7).[4] If the coefficients on the currency valuation variables are significant, then this will be yet another robust confirmation of the hypothesis that currency valuation is a serious determinant of economic growth rates.

4. The break year is not included in either the before or after computations.

Table 9.1 Currency valuation and growth accelerations and decelerations, 1950–2011 (percent)

Study (1)	Type of growth break (2)	Expected change in growth rates (3)	Currency valuation			Acceleration in growth (7)
			Before (4)	After (5)	Change (6)	
Hausmann, Pritchett, and Rodrik (2005)	Growth acceleration	Positive	68.5	57.6	–10.9	3.7
Balcerowicz and Fischer (2006)	Growth acceleration	Positive	32.3	24.2	–8.2	6.5
Commission on Growth and Development (2008)	Growth acceleration	Positive	108.4	66.6	–41.8	3.0
Bhalla (2007a)	Income doubling	Positive	39.4	29.4	–10.0	5.6
Eichengreen, Park, and Shin (2011)	Growth deceleration	Negative	–11.2	–4.1	7.1	–3.8
Bhalla (2007a)	Negative (toward undervaluation)	None	12.5	–4.7	–17.2	0.7
Bhalla (2007a)	Positive (toward overvaluation)	None	21.4	35.8	14.4	0.6
Bhalla (2007a)	Middle income threshold	None	8.2	0.1	–8.1	–2.1
Bhalla (2007a)	Year of maximum currency devaluation	None	59.8	35.6	–24.2	1.8
Average			35.3	24.9	–10.4	1.9

Notes: Growth breaks identified using the dataset in Bhalla (2007a). The seven-year average currency valuation enters the bottom third percentile of the seven-year average. Income doubling refers to the number of years taken by an individual country to double its income per capita, 1950–2011. The first four studies yield an average acceleration of 4.7 percent per year.

Table 9.2 shows the results after pooling the data for the nine datasets. Four sets of results are presented for different combinations of sample selection and growth break years. The results are surprising, especially given the literature. Currency valuation is very significant in explaining growth accelerations and decelerations. For 487 different break years for more than 100 countries over the past 60 (1950–2011), each 10 percent change in currency valuation affects growth by –0.2 percent. The impact is fairly constant across datasets. The impact of the acceleration of change in valuation varies between –0.1 and –0.24.

Results for the tests on the middle income trap are reported in table 9.3. The first row presents the conventional fixed effects model used throughout the book. A middle income dummy has a positive sign, although the coefficient is not significant. This test suggests that there is little evidence that the growth in income per capita stalls once an economy gets into this zone. Brazil's experience in the 1980s is not common, let alone universal. The other two regressions report results for growth acceleration for the two different middle income samples. Both show very sharp effects for currency valuation. The hypothesis stated at the start of this chapter was that the middle income trap may involve an identification problem—that successful growth might cause currencies to become overvalued and that this overvaluation may cause the observed growth slowdowns. But there does not seem to be any evidence for this.

The significance of currency undervaluation for growth acceleration shown here stands in sharp contrast to the results of Hausmann, Pritchett, and Rodrik (2005). They use the Dollar-Easterly measure and find currency valuation to be insignificant. A change in the functional form relating the real exchange rate to income per capita considerably improves the importance and significance of currency valuation in explaining growth. This is further affirmation of the conclusion that measurement errors most likely cause a misinterpretation of the role of currency undervaluation in determining growth.

Chapter 4 suggested that a useful way to look at the real exchange rate was as a ratio of productivity to costs. If a currency is undervalued, this ratio is increased because of a lowering in the denominator (costs), which makes investments more profitable, which increases investment and thereby increases growth. According to the results presented in this chapter, growth accelerates when policy makes investments more profitable. The break years identified according to changes in currency valuation (positive and negative) do not reflect changes in growth rates but rather perceived improvements or deteriorations in relative competitiveness, with competitiveness measured by the change in the percentile ranking of currency valuation. No growth acceleration was expected or observed (the average acceleration was only 0.6 or 0.7 percent per year). Yet, currency undervaluation is significant: Countries that allowed costs to decline via a currency depreciation or the prevention of a currency appreciation reaped the fruits of higher growth. It is also noteworthy that break years chosen on the basis of growth show similar results.

Table 9.2 Explaining growth accelerations, different definitions, 1950–2011

		Coefficients				
			Difference in currency valuation			
Row	Model specifications	Initial income per capita	Initial	Average change	R^2	Number of observations
1	All sample	–9.84***	–0.020***	–0.16***	0.47	487
2	Selected sample	–9.87***	–0.013*	–0.099***	0.47	396
3	Row 2 excluding Russia and Eastern Europe	–9.73***	–0.023***	–0.11***	0.45	367
4	Row 3 and only currency valuation breaks	–11.67***	–0.03***	–0.24*	0.61	100

Notes: Statistical significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable for all model specifications is acceleration in growth rate of income per capita. For each of the different classifications of countries according to a break year, the model relates the acceleration in growth of income per capita to the difference in initial income per capita, the difference in initial currency valuation, and the difference in the average change in currency valuation. See text for details.

Source: Bhalla (2007a) dataset extended to 2011.

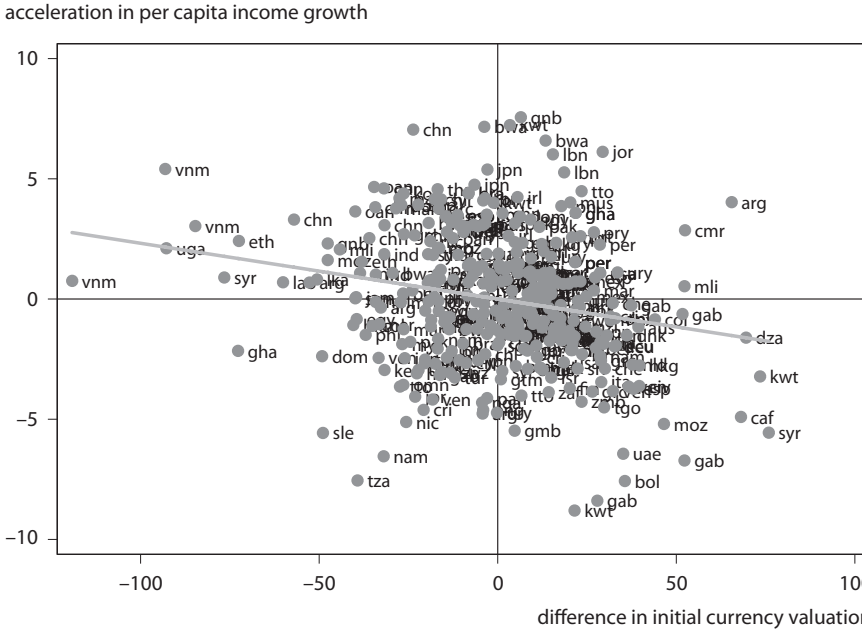
Table 9.3 Is there a middle income trap?

Row	Type/model	Dependent variable	Coefficients: Currency valuation: Initial	Coefficients: Currency valuation: Change (lagged)	Coefficients: Middle income	R^2	Number of observations
1	Selected sample	Per capita income growth	–0.013***	–0.029**	0.36	0.43	961
2	Middle income (Eichengreen, Park, and Shin [2011] definition)	Acceleration in per capita income growth	–0.064**	–0.16		0.37	33
3	Middle income (defined in text)	Acceleration in per capita income growth	–0.04**	–0.13		0.46	48

Notes: Statistical significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Data for row 1 are compiled in five-year intervals with the last five-year observation for 2005–11. See appendix A for details. The fixed effects model includes time and country dummies. Rows 2 and 3 relate acceleration in growth rate of income per capita with the difference in initial currency valuation and the difference in the rate of change in currency valuation. Middle income defined as income per capita between PPP$12,700 and PPP$25,400 in 2011 prices.

Source: Bhalla (2007a) dataset extended to 2011.

Figure 9.1 Added variable plot: Growth acceleration and initial level of currency valuation



coefficient = –.02318916, (robust) standard error = .00566043, t = –4.1

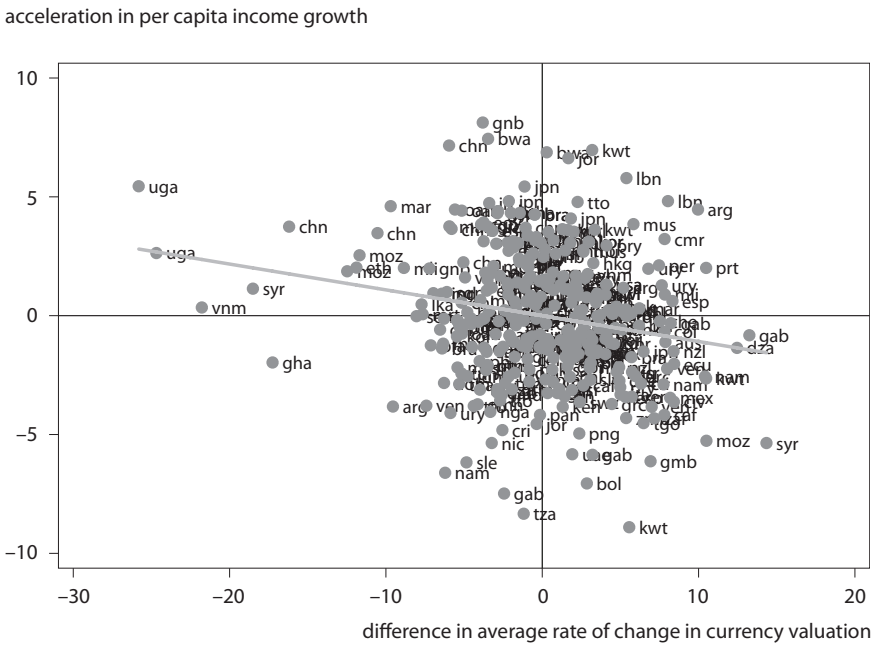
Notes: For each of the nine different classifications of countries according to identified break years, the model relates the acceleration in growth of GDP per capita to the difference in (log) initial income per capita, the difference in initial currency valuation, and the difference in the average change in currency valuation. Plot is based on equation reported in table 9.2, row 3. See text for details and appendix table B.1 for country abbreviations.

Source: Bhalla (2007a) dataset extended to 2011.

Figures 9.1 and 9.2 are the partial scatter plots for the all-inclusive sample (row 1 and the last two regressions in table 9.2, respectively). It is evident that outliers do not determine the significance. Regardless of whether the method has means (figure 9.1) or initial value and change (figure 9.2), the broad impact is apparent: Residuals are equally distributed on either side of the trend line.

The policy that best promotes growth can be called export-led growth, or openness to trade, or exchange rate undervaluation—the name does not matter, the results do. This conclusion is contrary to most, if not all, recent evaluations of the causes of growth, although it is consistent with the arguments of Balassa (1978) and some studies before 1990.

Figure 9.2 Added variable plot: Growth acceleration and average change in currency valuation



coefficient = –.1086147, (robust) standard error = .02657861, $t = -4.09$

Notes: For each of the nine different classifications of countries according to break years identified, the model relates the acceleration in growth of GDP per capita to the difference in (log) initial income per capita, the difference in initial currency valuation, and the difference in the average rate of change in currency valuation. Plot is based on equation reported in table 9.2, row 3. See text for details and appendix table B.1 for country abbreviations.

Source: Bhalla (2007a) dataset extended to 2011.