

Do Countries Exporting More Manufactured Products Grow Faster?

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November 14, 2008

Abstract

This paper empirically examines the hypothesis that countries exporting a larger share of manufactured products in total exports grows faster. Both cross-country and panel data analyses find evidence in support of the hypothesis for developing countries. The results are robust to the inclusion of a range of growth determinants. It is also shown that Asia's superior performance up to the mid-1990s can be explained largely by a rise in manufacturing export share, as well as human capital accumulation and lower inflation rates. The paper's findings support the view that not only trade openness but also export composite matters for growth.

1. Introduction

The postwar experience of fast growing East Asian economies, from Japan, Korea, and Taiwan to China, demonstrates the importance of manufacturing exports as a source of economic development. The high growth rates achieved by these economies were associated with a rapid increase in exports, particularly manufactured products. According to trade theory, gains from foreign trade can arise from a number of channels, such as specialization based on comparative advantage, economies of scale, diffusion of knowledge, and enhanced competition in domestic markets. However, the relationship between trade and economic growth is not unambiguous. In theory, trade can accelerate

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or decelerate growth. For instance, Grossman and Helpman (1991, ch9) show that a country whose technology development is lagging can be driven by trade to specialize in traditional sectors with low growth potential, thereby slowing its long-run growth. The endogenous growth model such as Matsuyama (1992) emphasises the importance of learning-by-doing in manufacturing sectors and predicts that an open economy with productive agriculture sectors will grow slower due to de-industrialization.

Consistent with this theoretical ambiguity, the empirical literature on the relationship between trade and income level or growth provides mixed results. Some studies find a statistically significant and positive relationship between trade volume and income level (Frankel and Romer, 1999) or measures of trade openness and growth (Sachs and Warner, 1995; Wacziarg and Welch, 2003). Others, however, find no such statistically significant relationship when controlling for institutional quality (Rodrik et al., 2004) or even a negative relationship between trade openness and growth (Yanikkaya, 2003). It seems that the evidence on the effects of trade on economic growth is not conclusive.

A closer examination of the relationship between trade and growth suggests that what matters for growth is not only the volume but also the composition of trade. Hausmann et al. (2007) construct an index to measure the level of productivity associated with a country's export composition; they show that this index is positively correlated with growth rates. In other words, these authors find evidence that a country exporting higher-productivity products grows faster. The possible explanation for this empirical finding is that transfer of resources from lower-productivity to higher-productivity products with the presence of elastic demand for them in world markets generates higher economic growth. The East Asian economies are cases in point. These economies successfully established comparative advantage in manufacturing sectors with high growth potential. Reflecting this, their high growth rates were associated with a rapid increase in the share of manufactured products in total exports. Importantly, East

Asia's structural transformation occurred despite unfavourable initial conditions in terms of technology development. This transformation might not have been achieved by trade liberalization alone, which would have facilitated specialization according to static comparative advantage. In fact, the East Asian governments promoted non-traditional manufacturing exports through a range of proactive policies, which facilitated technological catch-up and thus structural transformation (World Bank, 1993, pp.316-324). The experience of East Asia illustrates why it is important to focus on the relationship between export composite and economic growth.

The purpose of this paper is to investigate whether countries exporting a larger share of manufactured products in total exports grow faster. To this end, we estimate growth regressions in both cross-country and panel settings. The data sample includes a maximum of 72 countries for the period 1960-2004. The econometric technique used for the cross-country regressions is the ordinary least square (OLS) estimator and the two-stage least square instrumental variable (IV) estimator, while the panel data regressions use the generalized method of momentum (GMM) estimator. By controlling for a range of growth determinants, we seek to identify the independent effect of the share of manufacturing exports on growth rates, which could represent productivity-enhancing effects of manufacturing exports. Although there is a huge strand of the empirical literature that examines the growth effects of trade, few studies have focused on the relationship between export composition and growth.¹ This paper intends to fill this gap in the literature.

The rest of the paper is organized as follows. The next section presents the cross-country regression analysis. Section 3 presents the panel data analysis. Section 4 examines the robustness of the panel results by including additional controls. Using the estimated coefficients from the growth regression, Section 5 examines the sources of differences in growth performance between Asia and Latin America. Section 6 concludes.

2. Cross-country analysis

Before proceeding to the cross-country regression analysis, we first look at the growth experience of Asia and Latin America, which show distinct contrasts in terms of development of manufacturing exports. It can be seen from Table 1 that Asia, particularly East Asia, enjoyed a high per-capita growth rate from the 1970s through the 1990s. Latin America experienced relatively fast growth during the 1960s and 1970s but suffered negative growth during the 1980s in the wake of the debt crisis. Although its growth rate recovered moderately during the 1990s, it remained substantially lower than that of Asia.

[Table 1 around here]

Asia's superior growth performance during the 1980s was built upon its successful economic adjustments in response to the debt crisis. While the major economies rescheduled foreign debt in Latin America, none but the Philippines was forced to do so in East Asia. This was largely due to the faster export growth in East Asia, which kept the debt-export ratio and debt-service ratio relatively low. Sachs (1985, p.525) argues that East Asia's better performance was attributable to its successful development strategy, which focused on export promotion through trade and exchange rate policies.

More generally, the difference in growth performance between the two regions over the past three decades might be explained by the difference in export performance, particularly manufacturing exports. As can be seen from Table 1, the share of manufactured products in total exports increased constantly in Asia from the 1960s. By contrast, manufacturing export share remained much lower in Latin America after the 1980s. There seems to be a close linkage between the share of manufacturing exports and economic growth.

In order to systematically analyse this relationship, we estimate cross-country regressions using data for 65 countries for the period 1960-2004.² The econometric

technique used is the OLS estimator and the two-stage least square IV estimator.³ The dependent variable is the annual growth rate of log per-capita gross domestic product (GDP) averaged over the sample period of 1960-2004, which is regressed on the share of manufactured products in total exports averaged over the sample period.⁴ The data for per-capita GDP and manufacturing export share are taken respectively from the Penn World Table (Heston et al., 2006) and the World Bank's World Development Indicators. We also include the following standard controls for growth regressions: initial per-capita income, human capital, and institutional quality.

Initial per-capita income is measured by the log of per-capita GDP at the beginning of the sample period, that is, the average for 1960-64. Initial per-capita income is included to control for the convergence effect as predicted by the standard neoclassical growth model (Barro and Sala-i-Martin, 2004). This variable is anticipated to be negatively correlated with growth rates.

Human capital is measured by the share of secondary schooling attained in the total population aged over 15, which is averaged over the sample period. The data are taken from Barro and Lee (2001). The accumulation of human capital is expected to be positively associated with growth rates (Barro and Sala-i-Martin, 1992).

Institutional quality is measured by the social infrastructure index constructed by Hall and Jones (1999). This is a composite index comprised of measures of governance such as law and order and trade openness. An improvement in institutional quality is anticipated to be positively correlated with growth rates.

The potential endogeneity of manufacturing export share is controlled for by the instrument variables in the IV regressions. Following Hausmann et al. (2007), we use country size as an additional instrument. Country size is measured by log of population and log of population density, using the data from the World Development Indicators. The rationale for using this instrument is the presence of learning externalities in the industrialization process, which is modelled by Hausmann and Rodrik (2003). In their

model, costs of production in non-traditional industries are uncertain in developing countries. The information on these costs is revealed only after the initial investment is made, which, in turn, encourages investment by others. Because of these externalities, the role of the entrepreneurs making the initial investment is important for the development of non-traditional sectors in developing countries. Other things being equal, larger countries will have more entrepreneurs willing to take the risk of initial investment and therefore will have greater chances of producing and exporting non-traditional manufactured products.

Table 2 shows the estimation results for three different categories of groups: the whole sample of countries, the subset of developed countries, and the subset of developing countries. The distinction between developed and developing countries is based on purchasing power parity-adjusted per-capita GDP at the beginning of the sample period. Developed countries are those with initial per-capita GDP of more than 6,500 US dollars, while developing countries are those with less than 6,500 US dollars. The list of sample countries is reported in the appendix. The heteroskedasticity-consistent standard errors are reported in parentheses. In all IV regressions, both the F-statistics on the joint significance of the coefficients on the additional instruments, and the test statistics for the overidentifying restrictions suggest that the instruments are valid.

[Table 2 around here]

The OLS and IV regressions provide similar results. When estimated for the whole sample, the estimated coefficient on manufacturing export share is statistically significant and has the expected sign. All other estimated coefficients are also correctly signed and statistically significant. However, as reported in Columns (3)-(6), similar estimation results are obtained only for developing countries. For developed countries, the estimated coefficients on manufacturing export share are much smaller and statistically indistinguishable from zero in both the OLS and IV regressions. The

coefficients on human capital are also no longer significant. By contrast, the coefficients on manufacturing export share are even larger and highly significant in the estimation for developing countries. These results suggest that there is a significant and positive correlation between manufacturing export share and growth rates for developing countries. Importantly, this correlation is not due to simultaneous bias. The results for the IV regressions suggest that manufacturing export share exerts an independent positive effect on growth.

3. Panel data analysis

Recent empirical analyses have found that in developing countries undervalued exchange rates are associated with higher growth rates (Gale, 2007; Rodrik 2007). The conventional explanation of the negative correlation between exchange rate overvaluation and economic growth focuses on macroeconomic instability; overvalued exchange rates are associated with trade deficits and shortage of foreign currency, which increases the risk of a balance-of-payment crisis and disruption to economic growth (Fischer, 1993). However, there is little theoretical and analytical discussion of the mechanisms through which exchange rate *undervaluation* accelerates economic growth. One notable exception is Rodrik (2007), which provides empirical evidence and a theoretical accounting for this linkage. Rodrik argues that tradeable sectors suffer disproportionately from institutional and market failure and therefore their investment and output remain at sub-optimal levels in developing countries. Sustained real exchange rate depreciation could be a second-best solution, raising the profitability of investing in tradeable sectors. With greater production capacity, the output of tradeable sectors would increase, accelerating economic growth.

This theoretical argument has an important implication for our empirical analysis of the relationship between manufacturing export share and economic growth. It is possible that a rise in the share of manufacturing exports simply reflects the enhanced

production capacity of manufacturing sectors due to undervalued exchange rates. In other words, manufacturing export share might be a mere proxy variable for the degree of exchange rate undervaluation. If this is the case, the estimated coefficient on manufacturing export share may be much smaller or even statistically insignificant when the measure of exchange rate undervaluation is also included in the regression.

In order to examine this possibility, we estimate panel data regressions using a similar specification to Rodrik's (2007). Our panel consists of data for the maximum sample of 72 countries over the period 1960-2004. Unless otherwise stated, the data are averaged over non-overlapping, five-year periods. The dependent variable is the annual growth rate of log per-capita GDP, which is regressed on initial per-capita income, human capital, manufacturing export share, and the measure of exchange rate undervaluation. Initial per-capita income is measured by the five-year average of log of per-capita GDP in the preceding period. Human capital is measured by the share of secondary schooling attained in the total population aged over 15 at the beginning of each period. Manufacturing export share is the share of manufactured products in total exports. The data sources for these variables are the same as for the cross-country regressions above. We follow Rodrik (2007, p. 11) in calculating the degree of exchange rate undervaluation, which is measured by the deviation in a country's exchange rates from purchasing power parity after accounting for the Balassa-Samuelson effect. The data for this calculation are from the Penn World Table. All regressions include a full set of country-specific and time-specific dummies to control respectively for the unobserved heterogeneity between countries and common shocks.

The econometric technique used is the system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). The system GMM estimator is chosen because it can outperform the first-differenced GMM estimator when individual series are highly persistent. That is, the system estimator can not only greatly improve the precision but also reduce the finite sample bias by exploiting instruments

available for the equation in levels (Blundell et al., 2000, p. 88). When estimating the regressions, initial per-capita income and human capital are treated as predetermined variables, while manufacturing export share and exchange rate undervaluation are treated as endogenous variables.

Table 3 presents the results for three different categories of groups classified according to initial per-capita GDP as described earlier. The heteroskedasticity-consistent standard errors are reported in parentheses. The adequacy of model specification was checked using the Sargan test for overidentifying restrictions and the Arellano-Bond test for autocorrelation.⁵ Both tests do not reject the null hypothesis of correct specification in all but one regression. The exception is when estimating for the whole sample without including manufacturing export share as a regressor, in which case the Sargan test rejects the null (see Column (1)).

[Table 3 around here]

As shown in Table 3, the estimated coefficients on manufacturing export share and exchange rate undervaluation are positive and significant when these regressors are included separately in the regressions for the whole sample and the developing countries subset. However, they are not statistically significant when estimated for the developed countries. These results suggest that the positive effects on growth of manufacturing export share and exchange rate undervaluation operate only for developing countries. This is consistent with the empirical findings in Rodrik (2007), which uses a larger panel data set to find a positive correlation between exchange rate undervaluation and economic growth for developing countries.

When both manufacturing export share and exchange rate undervaluation are included as regressors, the estimated coefficient on exchange rate undervaluation is substantially smaller and statistically not significant at the 5% level even for developing countries. By contrast, the coefficient on manufacturing export share is highly significant and its size remains nearly the same. These results suggest that

manufacturing export share is not just a proxy for the degree of exchange rate undervaluation. Rather, it exerts an independent positive effect on growth, which is consistent with the earlier cross-national evidence.

4. Robustness to the inclusion of additional variables

We next examine the robustness of these panel results to the inclusion of a range of policy variables that could affect growth rates. Drawing on Easterly and Levine (2001) we add the following four policy variables as regressors: trade openness, inflation rate, government expenditure, and financial development.⁶

Trade openness is measured by the sum of exports and imports as a share of GDP at the beginning of each period. Although the literature does not provide conclusive evidence, we assume that trade openness is positively associated with growth rates. Inflation rate and government expenditure are used as indicators of macroeconomic stability. Inflation rate is measured by annual changes in the consumer price index (CPI) using the World Development Indicators data. The data for government expenditure, which is measured as a share of GDP, is taken from the Penn World Table. Both variables are expected to be negatively associated with growth rates (Fischer, 1993). Financial development is measured by the credit provided by banks to the private sectors, as a share of GDP. The data are taken from the World Development Indicators. Financial development is expected to be positively associated with growth rates (Levine et al., 2000). With the exception of trade openness, the data for these additional variables are averaged over non-overlapping, five-year periods.

The econometric technique we employ is the system GMM estimator. When estimating the regression, initial per-capita GDP, human capital, trade openness are treated as predetermined variables, while manufacturing export share, exchange rate undervaluation, inflation rate, government expenditure, and financial development are treated as endogenous variables. All specifications include a full set of country- and

time-specific dummies.

Table 4 presents the results for developing countries. The estimated coefficient on the lagged dependent variable is statistically significant, justifying the use of a dynamic model for estimation. Column (1) reports the results when manufacturing export share is not included as a regressor. All the estimated coefficients are statistically significant and have the expected signs. It should be noted that the estimated coefficient on exchange rate undervaluation is statistically significant even when controlling for a range of policy variables. Column (2) reports the result when manufacturing export share is also included. The estimated coefficient on manufacturing export share is correctly signed and highly significant even when controlling for various policy variables. The estimated coefficient on exchange rate undervaluation is no longer significant at the 5 % level, which is consistent with the earlier result.

[Table 4 around here]

To further check the robustness of the results, we included terms of trade as a regressor to control for country-specific external shocks.⁷ Terms of trade is measured by the log-difference of export and import deflators using the data from the United Nations National Account Main Aggregation Database. Terms of trade is treated as an exogenous variable in the regression. As can be seen from Column (3), the estimated coefficient on terms of trade is correctly signed but not statistically significant. Even when controlling for terms-of-trade shocks, the estimated coefficient on manufacturing export share remains highly significant and its size is almost the same.

In sum, these results confirm the robustness of the finding that there is a positive correlation between the exogenous component of manufacturing export share and growth rates in developing countries. It is particularly significant that this relationship is robust to the inclusion of the measure of trade openness, suggesting that manufacturing export share is not just a proxy for it.

5. Comparative analysis: Asia and Latin America

Using the estimated coefficients from the above panel regressions, we next analyse the sources of differences in growth performance between Asia and Latin America by decomposing the changes in growth rates into the parts explained by each explanatory variable.⁸

The regression equation is given by

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + f_i + f_t + \varepsilon_{it}; i = 1, 2, \dots, N; t = 1, 2, \dots, T \quad (1)$$

where Y_{it} denotes the five-year average of growth rates of log per-capita GDP in country i for period t , X_{it} denotes the vector of growth explanatory variables, f_i and f_t denote the country- and time-specific dummies respectively, and ε_{it} is the error term. Then, the change in growth rates from the previous period within the same country is obtained by taking the first difference of Equation (1):

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \beta \Delta X_{it} + \Delta f_t + \Delta \varepsilon_{it} \quad (2)$$

where Δ denotes the first-difference operator. Note that the country-specific dummy is removed from the expression because it is constant over time. By taking the average of the countries in region j , we obtain

$$\Delta \bar{Y}_t^j = \alpha \Delta \bar{Y}_{t-1}^j + \beta \Delta \bar{X}_t^j + \Delta f_t + \Delta \bar{\varepsilon}_t^j \quad (3)$$

where the bar denotes the regional average. Then, the difference in the changes in growth rates between Asia and Latin America is given by

$$\Delta \bar{Y}_t^A - \Delta \bar{Y}_t^L = \alpha(\Delta \bar{Y}_{t-1}^A - \Delta \bar{Y}_{t-1}^L) + \beta(\Delta \bar{X}_t^A - \Delta \bar{X}_t^L) + (\Delta \bar{\varepsilon}_t^A - \Delta \bar{\varepsilon}_t^L) \quad (4)$$

where the superscript A and L denote Asia and Latin America, respectively. Note that the time-specific dummy no longer appears in the expression. Taking the expectation of both sides we obtain the projected changes in Asia's growth rates relative to Latin America:

$$E[\Delta \bar{Y}_t^A - \Delta \bar{Y}_t^L] = \hat{\alpha}(\Delta \bar{Y}_{t-1}^A - \Delta \bar{Y}_{t-1}^L) + \hat{\beta}(\Delta \bar{X}_t^A - \Delta \bar{X}_t^L) \quad (5)$$

where the hat denotes the estimated value. Finally, we obtain the decomposition of the relative changes in growth rates by inserting the actual value of explanatory variables into the right-hand side of Equation (5).

Table 5 shows the decomposition of Asia's growth rate changes relative to Latin America, averaged over the periods before the mid-1990s and afterwards. The sample period is divided at the mid-1990s in order to take account of possible structural changes in growth rates after the Asian crisis of 1997-98. On average, Asia performed better than Latin America in terms of changes in growth rates before the mid-1990s. The gap in growth performance seems even to have widened during the 1980s. The decomposition of the relative growth change suggests that Asia's superior performance is largely due to three factors: a rise in the share of manufacturing exports, the accumulation of human capital, and lower inflation rates. Among these, the contribution of manufacturing export share stands out. Other factors, such as undervalued exchange rates and greater trade openness also contributed to Asia's superior growth performance. The exception is the convergence effect, which operated in favour of Latin America.

[Table 5 around here]

Latin America outperformed Asia over the period 1995-2004 due largely to the

diminished contribution of manufacturing export share for Asia and the reversal in the direction of the contribution from human capital and inflation rate in favour of Latin America. These changes seem to reflect the limited room for further catch-up in manufacturing export share and the school enrolment rate, which were already high in the relatively advanced Asian economies. This result is consistent with our finding that the effect of manufacturing export share on growth operates only for developing countries. The reversal in the direction of contribution from inflation rate is due to the fall in inflation rates under the stabilization programs implemented in the Latin American countries. Finally, it is interesting to note that the contribution from exchange rate undervaluation for Asia increases after the mid-1990s. This is presumably due to the sustained depreciation of exchange rates in some East Asian economies after the currency crisis of 1997-98.⁹

6. Conclusion

This paper empirically examined the hypothesis that countries exporting a larger share of manufactured products in total exports will grow faster. We estimated cross-country and panel regressions using the OLS and the IV estimators for the former and the system GMM estimator for the latter. Both cross-country and panel results support our hypothesis. We found a significant and positive relationship between the exogenous component of manufacturing export share and growth rates. The results are robust to the inclusion of a range of growth determinants, including exchange rate undervaluation and trade openness. Importantly, the growth promoting effect of manufacturing export share operates only for developing countries.

We also examined the sources of differences in growth performance between Asia and Latin America by decomposing the changes in growth rates into the parts explained by each explanatory variable. The results suggest that Asia's superior growth performance up to the mid-1990s can be explained largely by a rise in the share of

manufacturing exports, the accumulation of human capital, and lower inflation rates. Among them, the contribution from manufacturing export share is largest. However, its contribution becomes substantially smaller after the mid-1990s presumably due to the limited room for further increase in manufacturing export share, which was already high in the relatively advanced Asian economies.

The paper's findings are consistent with the view that trade liberalization per se does not assure faster growth in developing countries. The effect of trade openness on long-run growth will depend on how a country's comparative advantage pattern changes. Openness will promote growth when a country is led by trade to specialize in fast growing industries. Typically, such industries are non-traditional manufacturing sectors in technologically backward developing countries. As the experience of East Asia illustrates, the government can promote manufacturing exports through proactive policies, thereby realising the benefits of greater openness.

NOTES

1. A notable exception is World Bank (1993) which examines the relationship between the share of manufacturing products in total exports and economic growth within the cross-country regression framework. However, it does not deal with the potential simultaneity bias due to the endogeneity of regressors, including the manufacturing export share.
2. The data sample includes only 65 countries out of the full sample of 72 countries because the data for per-capita GDP and institutional quality are not fully available for 7 countries.
3. All the regression analyses in this paper were conducted using the software program Stata Statistical Software: Release 10 (StataCorp, 2007).
4. Alternatively, the performance of manufacturing exports can be measured by the share of manufacturing exports in GDP. However, this variable is likely to be strongly collinear with the variable for trade openness.
5. The Sargan test was computed using the homoskedastic estimator. The Stata program does not compute the Sargan test when the heteroskedasticity-consistent system estimator is used because its asymptotic distribution is not known.
6. Easterly and Levine (2001) also use a black market exchange rate premium to capture the degree of trade openness. However, we do not include it together with the measure of exchange rate undervaluation, because the two are likely to be collinear.
7. The data sample for this regression includes only 47 countries due to the limited availability of the data for terms of trade.
8. In this exercise Asia and Latin America are comprised of developing countries as defined above.
9. Asia's undervalued exchange rates have been the focus of policy debate on global imbalances. See IMF (2005, ch2).

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Table 1: Average growth rate and manufacturing export share

		(%)			
Year		Asia ^a		Latin America ^c	
		(East Asia ^b)		(Major7 ^d)	
1960-69	Per-capita GDP growth rate ^e	3.2	(3.5)	2.4	(2.9)
	Manufacturing export share ^f	26.6	(25.8)	31.2	(26.1)
1970-79	Per-capita GDP growth rate	4.3	(5.7)	2.5	(2.4)
	Manufacturing export share	39.2	(37.1)	20.7	(16.3)
1980-89	Per-capita GDP growth rate	3.8	(4.4)	-0.4	(-0.6)
	Manufacturing export share	51.8	(49.7)	22.9	(26.7)
1990-99	Per-capita GDP growth rate	3.6	(4.2)	1.3	(1.6)
	Manufacturing export share	76.3	(74.9)	18.4	(12.5)
2000-04	Per-capita GDP growth rate	3.2	(3.5)	0.5	(0.6)
	Manufacturing export share	80.9	(81.9)	25.5	(21.6)

a. Bangladesh, China, Hong Kong, India, Indonesia, Korea, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand

b. China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand

c. Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela

d. Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela

e. Purchasing power parity adjusted real per capita GDP growth rate. The data are from the Penn World Table.

f. The share of manufactured products in total exports. The data are from the World Bank World Development Indicators.

Table 2: Cross-country growth regressions

	<i>Dependent variable: growth rate of log per capita GDP over 1960-2004</i>					
	Whole sample		Developed countries		Developing countries	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	OLS	IV	OLS	IV
Manufacturing export share	0.019 (0.005)**	0.023 (0.007)**	0.003 (0.004)	0.001 (0.003)	0.026 (0.006)**	0.035 (0.010)**
Initial per-capita income	-0.012 (0.001)**	-0.012 (0.001)**	-0.152 (0.073)	-0.154 (0.063)*	-0.076 (0.013)**	-0.073 (0.012)**
Human capital	0.036 (0.010)**	0.033 (0.010)**	0.013 (0.009)	0.012 (0.008)	0.047 (0.014)**	0.038 (0.015)*
Institutional quality	0.015 (0.004)**	0.014 (0.004)**	0.012 (0.005)*	0.013 (0.004)**	0.014 (0.004)**	0.013 (0.004)**
Constant	0.114 (0.014)**	0.111 (0.014)**	0.357 (0.162)*	0.361 (0.138)**	0.171 (0.030)**	0.161 (0.029)**
F-statistics on instruments [p-value]		0.00		0.00		0.00
Overidentifying restrictions [p-value]		0.39		0.38		0.26
Observations	65	65	19	19	46	46
R-squared	0.61	0.61	0.58	0.57	0.70	0.69

Heteroskedasticity-consistent standard errors in parentheses

* significant at 5% level; ** significant at 1% level

a. Wooldridge's (1995) robust score test

Table 3: Panel growth regressions

	<i>Dependent variable: growth rate of log per capita GDP</i>								
	Whole sample			Developed countries			Developing countries		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Lagged dependent variable	0.204 (0.054)**	0.146 (0.042)**	0.141 (0.041)**	-0.138 (0.039)**	-0.151 (0.051)**	-0.153 (0.047)**	0.202 (0.052)**	0.177 (0.043)**	0.166 (0.040)**
Manufacturing export share		0.042 (0.009)**	0.043 (0.008)**		0.014 (0.017)	0.010 (0.014)		0.035 (0.009)**	0.034 (0.009)**
Exchange rate undervaluation	0.015 (0.005)**		0.006 (0.005)	0.006 (0.012)		0.008 (0.013)	0.018 (0.007)**		0.013 (0.007)
Initial per-capita income	-0.002 (0.003)	-0.008 (0.003)*	-0.009 (0.003)**	-0.007 (0.007)	-0.014 (0.007)*	-0.014 (0.007)	-0.011 (0.004)**	-0.011 (0.004)**	-0.013 (0.004)**
Human capital	0.007 (0.018)	-0.003 (0.016)	-0.008 (0.016)	-0.007 (0.012)	-0.008 (0.010)	-0.007 (0.012)	0.086 (0.031)**	0.044 (0.034)	0.038 (0.033)
Constant	0.041 (0.022)	0.081 (0.025)**	0.093 (0.026)**	0.105 (0.070)	0.169 (0.058)**	0.169 (0.067)*	0.102 (0.028)**	0.100 (0.030)**	0.119 (0.030)**
Sargan test [p-value]	0.01	0.15	0.10	0.19	0.22	0.26	0.62	0.67	0.56
Arellano-Bond test for second-order autocorrelation [p-value]	0.98	0.47	0.51	0.44	0.47	0.46	0.97	0.47	0.54
Observations	560	549	549	158	158	158	402	391	391

Heteroskedasticity-consistent standard errors in parentheses

* significant at 5% level; ** significant at 1% level

a. The Sargan test was computed using the homoskedastic estimator. See footnote 5.

Table 4: Panel growth regressions with additional policy variables

<i>Dependent variable: growth rate of log per capita GDP</i>			
	(1)	(2)	(3)
Lagged dependent variable	0.100 (0.036)**	0.088 (0.035)*	0.109 (0.044)*
Manufacturing export share		0.027 (0.009)**	0.025 (0.009)**
Exchange rate undervaluation	0.011 (0.005)*	0.009 (0.005)	0.011 (0.005)*
Initial per-capita income	-0.022 (0.004)**	-0.020 (0.004)**	-0.017 (0.004)**
Human capital	0.099 (0.027)**	0.061 (0.024)*	0.078 (0.025)**
Trade openness	0.011 (0.004)**	0.010 (0.004)**	0.007 (0.009)
Inflation rate	-0.001 (0.004)*	-0.001 (0.0004)**	-0.001 (0.0004)**
Government expenditure	-0.075 (0.037)*	-0.055 (0.030)	-0.051 (0.041)
Financial development	0.011 (0.004)*	0.006 (0.004)	0.003 (0.005)
Terms of trade			0.003 (0.008)
Constant	0.198 (0.032)**	0.184 (0.035)**	0.150 (0.032)**
Sargan test [p-value]	0.41	0.34	0.41
Arellano-Bond test for second-order autocorrelation [p-value]	0.32	0.25	0.97
Observations	375	366	307

Heteroskedasticity-consistent standard errors in parentheses

* significant at 5% level; ** significant at 1% level

a. The Sargan test was computed using the homoskedastic estimator. See footnote 5.

Table 5: Decomposition of Asia's growth rate changes relative to Latin America

	1970-94		1975-94		1980-94		1995-2004	
	(excl. Japan)		(excl. Japan)		(excl. Japan)		(excl. Japan)	
Lagged dependent variable	0.05	(0.06)	0.03	(0.04)	0.05	(0.05)	-0.11	(-0.11)
Manufacturing export share	0.15	(0.17)	0.16	(0.18)	0.20	(0.23)	0.04	(0.05)
Exchange rate undervaluation	0.06	(0.08)	0.05	(0.07)	0.05	(0.07)	0.12	(0.13)
Initial per-capita income	-0.25	(-0.24)	-0.28	(-0.27)	-0.28	(-0.29)	-0.29	(-0.31)
Human capital	0.05	(0.07)	0.10	(0.11)	0.11	(0.12)	-0.03	(-0.03)
Trade openness	0.02	(0.03)	0.04	(0.05)	0.05	(0.06)	0.08	(0.09)
Inflation rate	0.07	(0.07)	0.08	(0.08)	0.11	(0.11)	-0.17	(-0.17)
Government expenditure	0.05	(0.05)	0.02	(0.02)	0.00	(0.00)	-0.01	(0.00)
Financial development	0.03	(0.02)	0.03	(0.02)	0.03	(0.02)	0.06	(0.05)
Relative growth changes (projected)	0.23	(0.30)	0.24	(0.30)	0.33	(0.37)	-0.31	(-0.29)
Relative growth changes (actual)	0.02	(0.18)	0.26	(0.31)	0.35	(0.39)	-0.35	(-0.37)

The results when Japan is excluded from Asia are reported in parentheses.

Appendix: Country Samples

Developed countries (initial income of more than 6500 dollars)		Developing countries (initial income of less than 6500 dollars)			
	Initial per-capita GDP (US dollars) ^a		Initial per-capita GDP (US dollars)		Initial per-capita GDP (US dollars)
Argentina	7,880	Algeria	3,406	Korea	1,548
Australia	1,1311	Bangladesh	1,274 ^b	Malawi	460
Austria	9,094	Bolivia	2,517	Malaysia	1,941
Barbados	7,480	Brazil	2,946	Mexico	3,890
Belgium	8,888	Cameroon	1,957	Nepal ^c	803
Canada	11,182	Chile	5,282	Nicaragua	4,912
Denmark	12,541	China	398	Pakistan	858
Finland	8,453	Colombia	2,938	Panama	2,791
France	9,391	Costa Rica	4,455	Papua New Guinea ^c	2,467 ^b
Germany	14,541 ^b	Cyprus	5,862 ^b	Paraguay	2,620
Iceland	8,991	Dominican Republic	2,341	Peru	3,473
Israel	7,747	Ecuador	2,409	Philippines	2,148
Italy	8,075	Egypt	1,538	Portugal	4,128
Netherlands	10,981	El Salvador	3,156	Senegal	1,688
New Zealand	12,675	Fiji ^c	3,564 ^b	Singapore ^c	4,382
Norway	10,219	Greece	4,851	South Africa	5,340
Sweden	12,083	Guatemala	2,599	Spain	5,951
Switzerland	16,640	Honduras	1,695	Sri Lanka	954
United Kingdom	10,707	Hong Kong	3,949	Sudan	1,051 ^b
United States	13,615	India ^d	952	Syria	965
		Indonesia	1,059	Thailand	1,137
		Ireland	5,779	Togo	909
		Jamaica ^c	3,691	Tunisia	2,176
		Japan	5,479	Turkey	2,377
		Jordan	4,544	Uruguay	6,024
		Kenya	1,180	Venezuela	6,435

a. Per-capita GDP averaged over 1960-64. The data are from the Penn World Table

b. Per-capita GDP averaged over 1970-74. The data are not available for the earlier period.

c. The data for terms of trade are not available.

d. The data for institutional quality are not available.