



IMF Working Paper

The Determinants of Economic Growth in the Philippines: A New Look

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Asia and Pacific Department

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Abstract

This paper uses a panel of 23 emerging markets for the period 1965–2008 to study the determinants of per capita GDP growth in the Philippines. The Philippines is an outlier in terms of agricultural exports, investment, research and development, population growth, and political uncertainty. Panel regressions reveal that these factors, along with the deficit, inflation, trade openness, the current account balance and the frequency of crisis episodes are significant determinants of growth. A growth index confirms that these determinants also capture the absolute and relative performance of each country over time and suggests that the Philippines has lacked a sustained period of relatively strong economic reforms.

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I. INTRODUCTION

The world is witnessing Asia's transformation that is anticipated to change the face of the global economic landscape. With the advancement of Asia in terms of economy, influence and living conditions over the past half a century, much of the recent literature have recognized its potential to be an economic stronghold.²

Relative to the surging growth in Asia, the picture on Philippine growth has been mixed. However, the expected contribution of—as well as impact on—the Philippines from this promising Asian outlook is less than ideal. In the 1950s, the Philippines had the second highest per capita GDP in Asia. What used to be considered as the Philippines' counterparts in Southeast Asia: Malaysia, Indonesia, Thailand and Vietnam are now described as high-performing economies and are targeting first world statuses, while the Philippines is operating in a low-growth trajectory (Alba, 2007).

The objective of this paper is twofold. First, to identify the factors behind the Philippines' slower growth by contrasting its track record with other emerging markets in Asia and from other regions. Second, to recommend possible policy measures to address these factors. As far as we know, this is the first attempt to empirically estimate the determinants of slower growth in the Philippines, which include more recent macroeconomic data, novel methods such as index construction, and the use of patent applications to capture research and development.

The paper proceeds as follows. Section II gives an overview of the Philippine economy during the last half a century relative to other emerging markets. Section III describes the data, while Section IV presents the model and regression results. Section V proposes the construction of a growth index, to validate the identified variables from the panel in a country-level setting. Finally, Section VI gives the conclusion and policy implications.

II. A BIRD'S EYE VIEW OF THE PHILIPPINES AND THE REGION OVER THE LAST DECADES

Although a singular formula has not been credited as the reason behind Asia's rise in recent years, a laundry list of the features of the so-called miracle stories are in the literature. The Asian Development Bank (1997) gave the following reasons for the emergence of East Asia: export promotion, private sector-led development, agricultural transformation, high savings rates, skill accumulation and economic flexibility. These miracle economies have all become large-scale exporters of manufactured goods of increasing sophistication, have become highly urbanized and increasingly well-educated (Lucas, 1993).

² Among the recent studies that have chronicled Asia's rise to economic power are the World Bank's "An East Asian Renaissance: Ideas for Economic Growth" (2007) and the Asian Development Bank's "Asia 2050: Realizing the Asian Century" (2011).

Perhaps the greatest achievement of this sustained, rapid growth is significant poverty reduction and the commensurate improvements in the quality of life. Indonesia, Malaysia, and Thailand have reduced their poverty levels substantially compared to their mid-1970s levels. This is evident in the improvement of social indicators such as life expectancy, infant mortality, and adult literacy (Asian Development Bank, 2002).

Several studies have likewise focused on Philippine growth and provided possible explanations why the Philippines did not become the economic powerhouse it was expected to be. Many observers have attributed the Philippines' low growth to its weak institutions. Despite the Philippines being an open and growing economy, investment is relatively low compared to the rest of emerging Asia. Fiscal pressures due to weak revenue performance, weighty debt service, and high input costs put a strain on government spending, while the presence of conglomerates serves as a disincentive for the private sector to invest (Bocchi, 2008).

While other Asian countries have their share of similar institutional deficiencies, corruption and political instability are unique in the Philippines in its unpredictability and extent (Nelson, 2007). Another factor that has been identified is the detrimental effects to competitiveness of the economic protectionism and the import-substitution policies that were followed after World War II to the 1970s (Yap, et al., 2009).

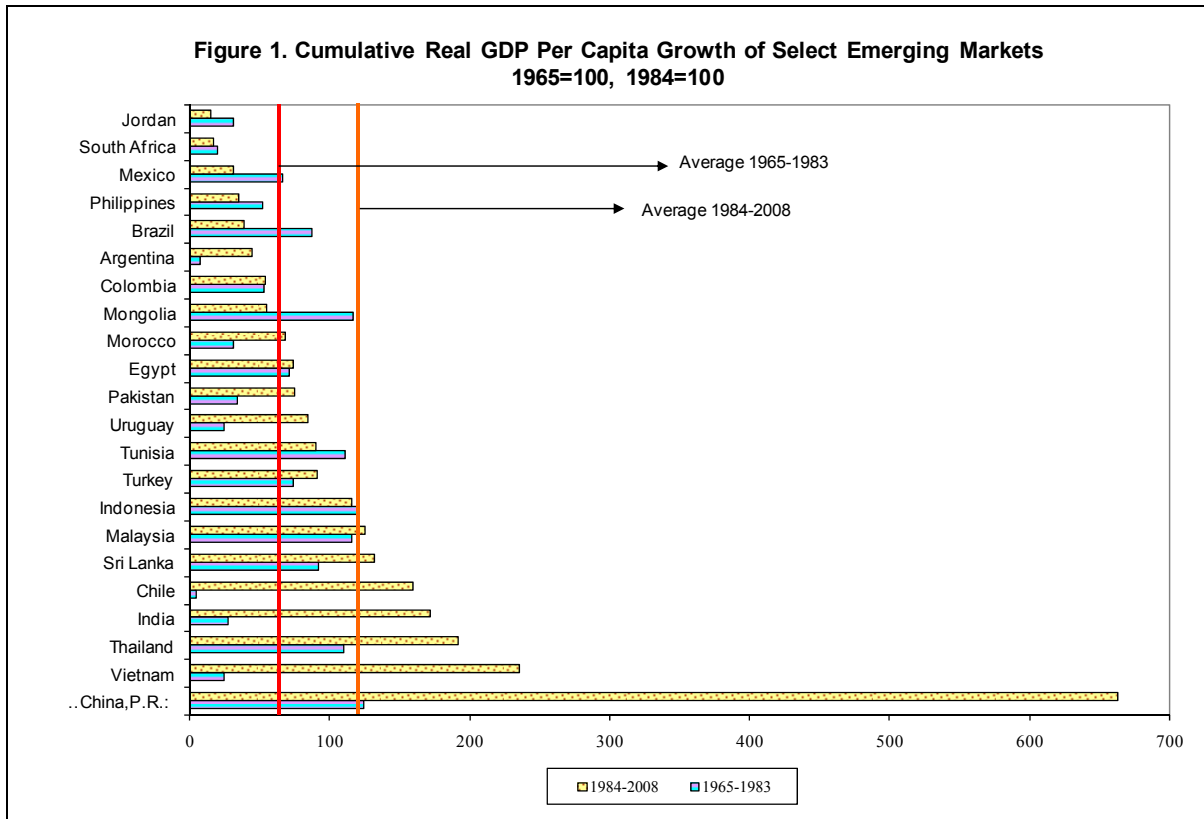
The Asian Development Bank (2007), using the growth diagnostics approach, identified the following critical constraints to Philippine growth and development: a tight fiscal situation, inadequate infrastructure, weak investor confidence, a small and narrow industrial base, lack and slow growth of employment, inequitable access to development opportunities, and inadequate social protection and safety nets.

According to the World Bank (2010), although economic growth picked up sufficiently in the past decade, its sustainability is in question. The Philippines' high dependency on the external environment and its long-standing constraints to growth—lack of adequate infrastructure, low investment, high unemployment and emigration rates, and government weakness—may still constrain growth. For a recent study on comparing total factor productivity (TFP) growth in the Philippines with other emerging markets, see Ide (2011).

To better visualize these differences in growth, the Philippines is compared to three sets of emerging markets, grouped by their cumulative GDP growth rates. Twenty-two other emerging markets, eight of which are in Asia, are used for comparison. The countries are ranked according to their cumulative growth rates during 1984–2008:

- *Top performing* (Chile, China, India, Indonesia, Malaysia, Sri Lanka, Thailand, and Vietnam);
- *Moderately growing* (Egypt, Mongolia, Morocco, Pakistan, Tunisia, Turkey, and Uruguay); and
- *Slower growing* (Argentina, Brazil, Colombia, Jordan, Mexico, Peru, and South Africa).

The ‘top-performing’ group consists mostly of Asian economies. The group is completed by Chile, which ranked fifth. Almost all other Latin American economies belong to the third or ‘slower-growing’ group together with the Philippines, which is ranked 20th. Growth on average accelerated in the period 1984–2008 compared to 1965–1983, but not in the Philippines where it declined (see Figure 1).



During 1965–1983, the Philippine economy performed broadly in line with the average, but was hit by political unrest,³ a string of natural disasters,⁴ and economic turmoil in 1984. The GNP contracted by -6.8 percent in 1984, followed by a further -3.8 contraction in 1985. Investment, both domestic and foreign, declined dramatically and capital outflows reached as high as US\$2 million a day.⁵ While the natural disasters and economic turmoil that happened in 1984 can be seen as temporary shocks, the political instability in 1984 seems to be the key factor for the rapid growth deceleration given its long run impact on the economy.

³ Kessler, Richard J., *Politics Style*, Circa 1984. *Asian Survey*, Vol. 24, No. 12 (Dec. 1984).

⁴ UN Department of Humanitarian Affairs. (1984). *Philippine Typhoons Sep 1984 UNDR0 Situation*. Available: <http://reliefweb.int/node/36373>. Last accessed June 29, 2011.

⁵ Bunge, Frederica M. (1992). *Philippines: A Country Study*. Available: <http://country-studies.com/philippines>. Last accessed June 29, 2011.

Hausmann, et al. (2005) defines economic turning points as rapid acceleration in economic growth sustained for at least eight years. For the Philippines, 1984 was such a turning point marked by a rapid deceleration in per capita GDP growth.

In terms of the sectoral sources of value added, all the countries in the sample share essentially the same structure: the services sector is dominant, followed by industry, then agriculture (Table 1). However, the difference lies in the growth rates of these sectors.

Table 1. Sectoral Value Added and Growth

Emerging Markets	Agriculture		Industry		Industry, of which, Manufacturing		Services, etc.	
	1965-1983	1984-2008	1965-1983	1984-2008	1965-1983	1984-2005	1965-1983	1984-2005
	<i>Value Added (in percent of GDP)</i>							
<i>Top-Performing</i>	28.3	18.1	31.0	37.0	19.5	22.8	40.7	44.9
<i>Moderately Growing</i>	26.3	17.5	25.6	29.5	14.7	18.0	48.1	52.9
<i>Slower Growing</i>	13.1	7.4	34.8	32.3	23.3	19.7	52.1	60.3
Philippines	28.0	19.2	34.7	32.9	25.0	23.5	37.3	47.9
	<i>Growth (in percent)</i>							
<i>Top-Performing</i>	3.5	3.3	7.1	7.4	7.3	8.0	6.8	7.0
<i>Moderately Growing</i>	3.1	3.3	6.9	4.2	7.5	4.5	6.8	4.6
<i>Slower Growing</i>	3.4	3.1	5.5	3.2	4.4	3.2	5.2	3.4
Philippines	3.5	2.4	6.4	2.4	5.4	2.7	5.0	4.2

Source: WB World Development Indicators.

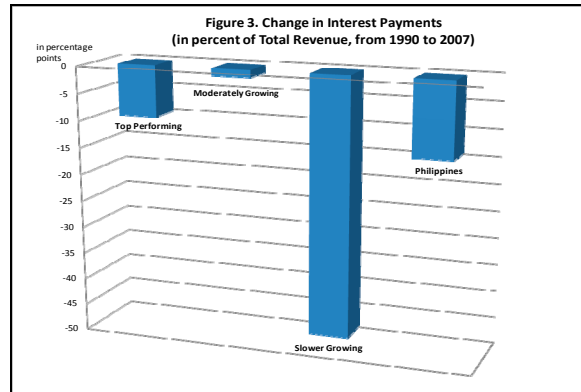
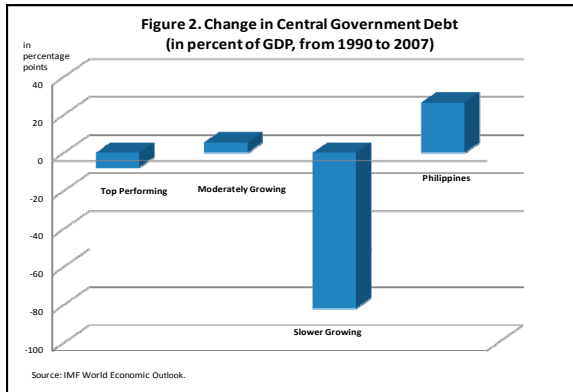
In general, sustained development in East Asia can be attributed to a significant rise in agricultural output and income, followed by the growth of export-oriented, labor-intensive manufacturing (Intal and See, 2008). East Asian governments (with the exception of Hong Kong SAR and Singapore) invested sufficiently in agricultural research, local extension services and rural infrastructure that significantly increased their agricultural productivity (ADB, 1997).

However, the Philippines was unable to develop its agriculture and industry sectors (particularly manufacturing) to be at par with its Asian neighbors even after some of the turmoil from 1984 dissipated. In fact, growth in the agriculture and industry sectors, as well as the manufacturing sub-sector, were lower than the ‘slower-growing’ group average for 1984–2008.

The literature on economic growth has identified a number of factors that might explain growth. These determinants are discussed in the following section where the Philippines is contrasted with the three other sets of emerging markets.

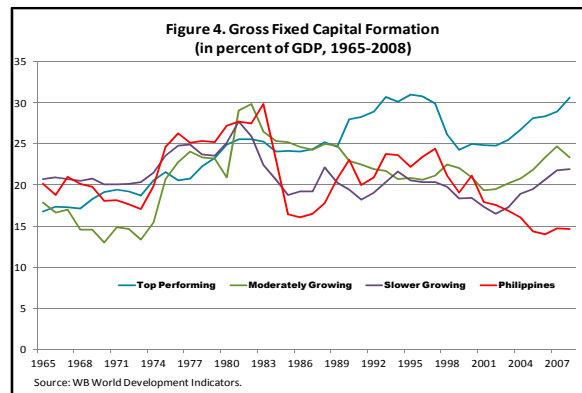
III. POTENTIAL DETERMINANTS OF SLOWER GROWTH

A. The Role of Fiscal Policy



Indicators of fiscal policy in the Philippines are broadly comparable with other emerging markets, except for the increase in debt (Table A.1). The deficit and tax revenue, both in percentages of GDP, are comparable to the other emerging markets despite showing no signs of improving. Central government debt in percent of GDP increased steadily, a reversal from the overall decreasing trend (see Figure 2). However, interest payments in percent of revenues have consistently been above the emerging market averages, which may be reflective of the stagnant revenue growth (Figure 3).

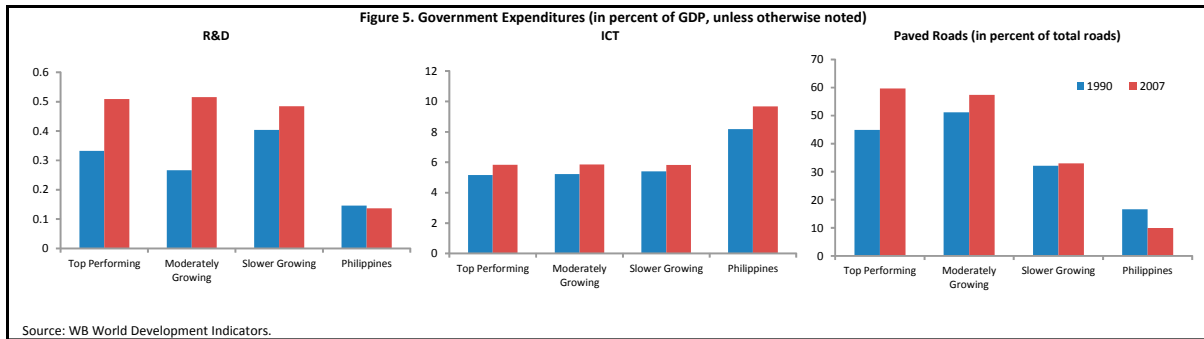
The Philippines is characterized by slower and declining public and private investment (Table A.2). Capital investments in percent of GDP has declined, compared to the increasing trends of other emerging markets (see Figure 4). Government investment in percent of tax revenue has also declined since 1997, suggesting that this component was compressed during the fiscal adjustment in this period. Notably, governments of the top-performing group invest almost thrice as much as the Philippine ratio.



The Philippines stands out as having very low public spending on education (Table A.3). Government spending in education in percent of GDP has increased, albeit lower than the group averages. Data on per capita spending per student show that averages across countries have declined. However, the deficiency in the Philippine educational spending is most pronounced in the tertiary level when compared to other emerging markets.

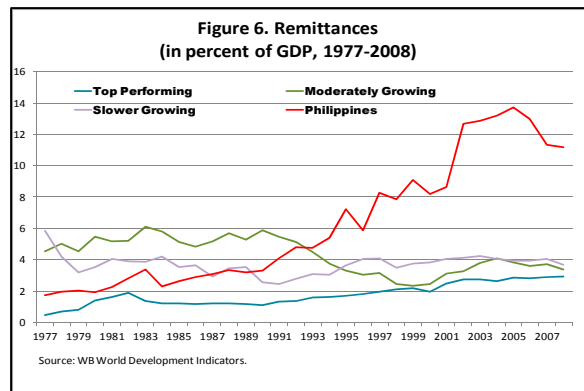
The Philippines has meager government spending on research and development and transportation, but has substantial expenditure in information and communications technology (Table A.4). Government expenditure in research and development in percent of

GDP as well as paved roads in percent of total roads continue to be below the group averages and has declined further recently. However, the ICT expenditures in percent of GDP is one of the highest among emerging markets in 2003 and 2006. This is evident in the upsurge of cellular technology and high-technology exports (i.e., semiconductors) in the Philippines in recent years.



B. External Developments

The Philippines' external position is relatively strong, as evidenced by its low spreads, but has a larger trade deficit and smaller foreign direct investment inflows (Table A.5). The trade deficit has been substantial; however, it must be noted that the Philippines has been operating a current account surplus since 2003, on account of strong remittance inflows. Net FDI inflows in percent of GDP is below the averages of other countries. The Emerging Markets Bond Index (EMBI) sovereign spreads, or the standard market measure of sovereign default risk, has declined substantially and is now comparable to other emerging markets.



The share of remittances in GDP has tripled, while the emigration rate of college graduates continues to increase (Table A.6). Averaging 7.3 percent of GDP in 1984–2008, remittances in the Philippines are the second highest among the emerging markets. The trend in emigration of college graduates in the Philippines is increasing, compared to the generally decreasing trends in other emerging markets.

The performance of Philippine tourism has been below the comparators, but is catching up (Table A.6). The number of tourist arrivals is significantly lower in 1995 and 2007 than in its emerging market counterparts. However, tourism receipts are becoming an increasingly important part of exports, having doubled from 1995 to 2007, while those of other emerging markets remained generally the same.

C. The Agricultural Sector

The Philippines has the lowest agricultural exports in the region (Table A.7). This indicator is an approximate measure of the degree to which an economy's exports are dependent on agricultural raw materials. A look at the agricultural component of merchandise exports shows a big drop for the Philippines in 1984–2005 relative to 1965–1983. However, the Philippines' other agricultural statistics are comparable with the top-performing emerging markets (Table A.8).

D. Political Stability and Reform Indicators

Income inequality has increased relatively more in the Philippines compared to other emerging markets (Table A.9). The GINI coefficient has worsened in the Philippines, while being broadly stable for the other emerging markets. The top 10 percent income earners have increased their share of the economic pie, while the bottom 10 percent and the middle income groups saw their decline. The reverse is true for the top performers, which pertains to a more equitable distribution of income.

The Philippines has relatively more trade freedom, but also more corruption and barriers to doing business (Table A.10). Generally, the Philippines' economic freedom index is consistent with the other emerging markets. The Philippines' trade freedom index increased dramatically between 1995 and 2010, reflecting strong trade liberalization. Indices of corruption and the ease of doing business in the Philippines are consistently lower compared to other emerging markets.

In terms of taxes, the Philippines is similar to the emerging market average (Table A.11). Indicators of tax efficiency remained almost the same from 2006 to 2010, while other emerging markets were able to improve theirs.

Slower-growing economies in general and the Philippines in particular have faster population growth and a greater number of crisis episodes, coups and years under colonial rule (Table A.12). Population growth in the Philippines has consistently been above the average of other emerging markets and has decelerated at a slower pace. The Philippines has also experienced a greater number of financial crises (banking, currency and debt crises in 1983, aside from the regional crisis of 1997/1998) than other emerging countries. The number of coups (successful as well as attempts) in 1984–2010 has been triple the average in other emerging markets, reflecting greater political uncertainty. Looking back at history, the Philippines experienced the longest colonial rule (333 years under Spain) compared to the averages of the emerging market groups, with potential implications for the quality of institutions and sense of national identity.

The Philippines has relatively high literacy, but is weak in research and development (Tables A.13 and A.14). The percentage of literate individuals is higher in the Philippines compared to other developing countries. However, the number of researchers, scientific and technical journal articles as well as patent applications has lagged other emerging markets substantially.

Index scores in competitiveness, technology, and innovation are among the lowest in emerging markets (Table A.15). Different ranking and reform indices show that the Philippines has fallen behind emerging market norms.

The Philippines' mediocre performance in a number of indicators—particularly relative to its Asian counterparts—illuminates some of the existing pieces of the Philippine growth puzzle. Although broadly speaking, the Philippines does not seem to be an outlier in the context of most indicators presented, a few interesting variables emerge, which will be the focus in the empirical section: i) weak agricultural productivity, ii) high government debt, iii) low public, private, and foreign investment, iv) weak research and development spending, v) low spending on education, vi) lackluster tourism sector, vii) relatively high income inequality, viii) high corruption, ix) strong population growth, x) more episodes of financial crisis, and xi) political uncertainty.

IV. EMPIRICAL APPROACH AND RESULTS

The impact of the identified economic indicators on real GDP per capita of emerging markets is estimated using panel regression techniques. Indicators that are standard in the growth literature are included as control variables: log of initial per capita GDP, inflation and trade openness (Barro and Sala-i-Martin, 2004).

We also include regressors that are regarded as the most influential for developing countries as in Petrakos, et al. (2007), such as stable political environment, good infrastructure, favorable demographic conditions, and research and development (proxied by the number of coups, gross fixed capital formation in percent of GDP, population growth, and the number of patent applications, respectively).⁶ The deficit and the current account balance (both in percent of GDP) are also included in the model to capture the effects of economic policies and macroeconomic conditions on growth performance. While most of the literature has focused on agricultural productivity as the choice variable in growth regression models, this paper attempts to use instead agricultural exports in percent of merchandise exports to put emphasis on the developing countries' considerable comparative advantage in agriculture.⁷

A fixed-effects panel regression is employed (as in Arora and Vamvakidis, 2004). We only include a fixed effect for the time series dimension, while the level of initial per capita GDP captures the cross-sectional fixed effect, with the following specification:

$$(\textit{Real GDP Per Capita Growth})_i = c_i + \beta X_i + u, \quad \textit{for country } i = 1, 2, \dots, n$$

⁶ Petrakos, et al. (2007) likewise provide a comprehensive account of the different theories on the determinants of economic growth with references to related studies.

⁷ See similar studies of Njikam, 2003 and Memon, et al., 2008. Notably, in the Philippine scenario which is this paper's main concern, the indicators of agricultural productivity are broadly similar with other emerging markets while that of agricultural exports is markedly lower.

Regression results broadly show that coefficients are significant and consistent with results in the growth literature (Table 2). The level of initial per capita GDP suggests the presence of convergence, that is, countries with lower initial per capita GDP tend to grow more rapidly than countries with higher initial GDP, consistent with the results in many other studies.

Table 2. Regression Results on Determinants of Real Per Capita GDP Growth^{1/ 2/ 3/ 4/}

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	2.70 ** (1.1175)	3.67 *** (1.2230)	3.60 *** (1.2337)	3.20 *** (1.2288)	2.22 ** (1.1119)	3.22 ** (1.2645)	2.66 ** (1.2474)
Log of Initial Real Per Capita GDP	-0.15 ** (0.0626)	-0.19 *** (0.0705)	-0.19 *** (0.0712)	-0.19 *** (0.0711)	-0.12 * (0.0626)	-0.17 ** (0.0719)	-0.17 ** (0.0711)
Log of Agricultural Exports in percent of Merchandise Exports (-1)	0.34 ** (0.1590)	0.39 ** (0.1757)	0.40 ** (0.1757)	0.41 ** (0.1772)	0.44 *** (0.1565)	0.39 ** (0.1850)	0.30 * (0.1766)
Fiscal Balance in percent of GDP	0.07 ** (0.0358)	0.07 * (0.0402)	0.08 * (0.0404)	0.07 * (0.0409)	0.11 *** (0.0351)	0.08 ** (0.0422)	0.07 * (0.0409)
Gross Fixed Capital Formation in percent of GDP (-1)	0.10 *** (0.0297)	0.07 ** (0.0357)	0.07 ** (0.0359)	0.10 *** (0.0302)	0.11 *** (0.0277)	0.07 * (0.0370)	0.14 *** (0.0361)
Number of Patent Applications	3.27E-05 *** (0.0000)	4.39E-05 * (0.0000)	4.47E-05 *** (0.0000)	3.86E-05 *** (0.0000)	3.75E-05 *** (0.0000)	4.71E-05 *** (0.0000)	1.89E-05 * (0.0000)
Population Growth	-0.47 * (0.2600)	-0.78 ** (0.3178)	-0.79 ** (0.3172)	-0.63 ** (0.3104)	-0.49 * (0.2571)	-0.78 ** (0.3509)	-0.57 * (0.3308)
Number of Coup d'etat	-0.63 (0.5793)	-0.82 (0.6626)	--	--	--	--	--
Number of Crisis Episodes	-2.62 *** (0.5387)	-2.38 * (0.5171)	-2.36 *** (0.5158)	-2.38 *** (0.5163)	-2.60 *** (0.5328)	--	-2.33 *** (0.5516)
Inflation Rate	-1.59E-03 *** (0.0003)	-1.60E-03 * (0.0003)	-1.60E-03 *** (0.0003)	-1.65E-03 *** (0.0003)	-1.50E-03 *** (0.0003)	-1.74E-03 *** (0.0004)	-1.59E-03 *** (0.0004)
Total Trade in percent of GDP	0.01 (0.0044)	0.01 ** (0.0052)	0.01 ** (0.0052)	--	--	0.01 ** (0.0052)	-9.58E-04 (0.0056)
Trade Balance in percent of GDP	--	--	--	--	-0.05 *** (0.0181)	--	--
Current Account Balance in percent GDP	--	-0.12 ** (0.0528)	-0.12 ** (0.0528)	-0.09 ** (0.0475)	--	-0.13 ** (0.0581)	0.12 ** (0.0476)
Adjusted R ²	0.2117	0.2588	0.2585	0.2542	0.2208	0.2086	0.2631
Number of observations	620	507	507	509	623	507	493

1/ Data for the independent variables are in levels except for agricultural exports (in percent of merchandise exports), inflation (growth rate), and fiscal balance, gross fixed capital formation, total trade, trade balance and current account balance (in percent of GDP).

2/ ***, **, * refer to 1 percent, 5 percent and 10 percent levels of significance, respectively.

3/ Standard error in brackets.

4/ Equation (7) uses the current account balance with a one-year lag.

A higher share of agricultural exports in total exports is associated with higher per capita GDP growth. This could support the view that growth in the agricultural sector is a prerequisite for the services and industry sectors to grow, especially in the East Asia experience. Dawson (2002) provided empirical evidence on how agriculture's contribution to total exports—and hence to GDP—is substantial in less developed countries. Note that if we are to replace agricultural exports with an indicator of agricultural productivity (such as value added in agriculture per worker), the results are insignificant.

A higher fiscal surplus in percent of GDP is associated with faster growth, which could be a proxy for macroeconomic stability. Burnside and Dollar (2004) also found that a fiscal surplus policy has a large positive effect on growth.

Higher investment—as proxied by gross fixed capital formation in percent of GDP—is significantly correlated with higher growth (Asmann, 2008). The number of patents applied—which is a proxy for research and development—is also highly significant. This is consistent with Madden and Bloxham (2001) who found a positive and significant relationship between growth and domestic research and development capital in developing countries.

Including the number of crisis episodes (IMF financial crisis episodes database, 2008) has a highly significant and negative effect on growth. A “crisis episode” is defined as a *systemic banking, currency* or *debt* crisis. Country experiences show that a financial crisis is usually followed by a deep recession and a sharp current account reversal (see Laeven and Valencia, 2008, for details). Higher population growth and inflation rates have adverse effects on growth (see also Barro, 1996, for similar results).

However, not all of the identified variables from the previous section are significant. Surprisingly, in the baseline specification, insignificant effects are found for the number of coups and total trade in percent of GDP. However, the addition of the current account balance in percent of GDP in the second specification shows that trade openness is significant. Although the number of coups is not significant, it does not affect the robustness of the results (see specification 3). Also note that some of the variables that are likely to influence GDP—such as debt, spending on education and research and development, tourist arrivals and, in particular, governance indicators—are not included in the model because of their shorter data series.

Some of the external sector variables in the specification—although significant—have correlation coefficients whose signs are counterintuitive. The current account and trade balances (specifications 4 and 5, respectively) are negatively associated with growth. Pitchford (1992) argued that stabilizing the current account balance is irrelevant if it is arising essentially from private sector transactions. For example, a developed country such as Australia has large and persistent current account deficits since the 1980s, much of which has been financed through foreign direct investment (Collins, 1994). Nevertheless, this is surprising since consistent and large deficits have been attributed with balance of payments crises, in turn leading to lesser growth. As such, the current account balance could be correlated with the inclusion of the crisis dummy. However, in specification 6, the current account balance maintains a negative relation with growth after dropping the crisis dummy from the model specification. One possible explanation might be that the negative coefficient suggests the presence of reverse causality; that is, from growth to the current account: low per capita GDP leads to high expected rates of return and capital inflows.

Reverse causality—from growth to the current account—has been observed especially in the context of emerging markets. Aristovnik (2006) also observed that the causality operates from growth to the current account balance for some transition economies—economic growth has a negative effect on the current account balance—implying that the domestic growth rate is associated with a larger increase in domestic investment than saving. This is consistent with the theoretical literature, although empirically this result is generally not observed. Lucas (1990) asserted that capital is not flowing from developed countries to developing countries as expected because of capital market imperfections. Specification 7 includes the lagged current account balance to adjust for this potential reverse causality, which shows a positive and significant effect.

There are significant differences in the variables that are important for the top-performing, moderately growing, and slower-growing groups (Table 3). Although the separate by-group regressions reduce the cross-section sample size in each specification and thus must be interpreted with caution, the results provide further implications consistent with the analysis.

Table 3. Regression Results on Determinants of Real Per Capita GDP Growth, By Group 1/ 2/ 3/ 4/

Variables	Top - Performing	Moderately Growing	Slower Growing
Constant	14.55 (0.0001)	4.90 (4.1323)	3.97 (4.5898)
Log of Initial Real Per Capita GDP	-0.54 (0.0003)	-0.48 (0.2196) **	-0.03 (0.2173)
Log of Agricultural Exports in percent of Merchandise Exports (-1)	0.30 (0.5654)	0.92 (0.4086)	-0.12 (0.9401)
Fiscal Balance in percent of GDP	0.21 ** (0.0221)	0.11 (0.0683)	0.14 (0.1691)
Gross Fixed Capital Formation in percent of GDP (-1)	-0.08 (0.3605)	-0.02 (0.0710)	-0.05 (0.1352)
Number of Patent Applications	5.14E-05 *** (0.0023)	-3.96E-04 (0.0014)	-1.57E-04 (0.0003)
Population Growth	-1.24 (0.0404)	0.04 (0.7636)	-0.53 (1.5296)
Number of Crisis Episodes	-2.90 ** (0.0304)	-2.40 *** (0.5810)	-2.77 ** (1.0578)
Inflation Rate	-0.06 (0.4497)	-7.65E-04 (0.0233)	-8.88E-04 ** (0.0004)
Total Trade in percent of GDP	-2.56E-03 (0.7983)	0.03 (0.0303)	0.02 (0.0576)
Current Account Balance in percent of GDP	-0.15 (0.1681)	-0.17 (0.1097)	-0.12 (0.0931)
Adjusted R ²	0.4556	0.0977	0.3157
Number of observations	168	166	141

1/ The 22 other emerging markets are grouped by their cumulative GDP per capita growth rates during 1984-2008 into three groups: top-performing (China, Vietnam, Thailand, India, Chile, Sri Lanka, Malaysia and Indonesia), moderately growing (Turkey, Tunisia, Uruguay, Pakistan, Egypt, Morocco and Mongolia), and slower-growing (Colombia, Argentina, Peru, Brazil, Mexico, South Africa and Jordan).

2/ Data for the independent variables are in levels except for agricultural exports (in percent of merchandise exports), inflation (growth rate), and fiscal balance, gross fixed capital formation, total trade, trade balance and current account balance (in percent of GDP).

3/ ***, **, * refer to 1 percent, 5 percent and 10 percent levels of significance, respectively.

4/ Standard error in brackets.

The top-performing group has significant results for the fiscal balance in percent of GDP, the number of patent applications, the number of crisis episodes, and population growth. The variable on agricultural exports in percent of total exports is not significant since these fast-growing emerging markets tend to depend more on higher value exports. Also, the important role of research and development is seen as the number of patent applications variable is significant. Although these countries have more developed financial markets, they are still vulnerable to crisis episodes, which come with large losses in output. Maintaining a fiscal surplus has a significant, positive effect on growth. However, population has a negative effect on growth for the top-performing group.

The moderately growing and slower-growing groups have fewer numbers of indicators that are significant. The moderately growing group has significant effects for agricultural exports in percent of total exports and the number of crisis episodes. On the other hand, the results underscore the importance of macroeconomic stability on growth in the slower-growing group, which has significant effects for inflation, and again, the number of crisis episodes.

The results are generally robust to adjusting for potential endogeneity in the model. In the literature, five-year averages are usually used to control for endogeneity (see for example, Barro and Sala-i-Martin, 1996, and Ide, 2011), as shown in Table 4.⁸ The results are broadly consistent with the annual data, except that fiscal balance as well as total trade and the current account balance turned insignificant. Separate by-group regressions for the five-year averages were not estimated due to the limited number of observations.

Table 4. Regression Results on Determinants of Real Per Capita GDP Growth, 5-year averages 1/ 2/ 3/

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.44 (1.1255)	1.37 (1.1581)	1.02 (1.1305)	1.06 (1.1408)	0.84 (1.1091)	0.34 (1.3626)
Log of Initial Real Per Capita GDP	-0.13 * (0.0667)	-0.13 * (0.0792)	-0.12 (0.0806)	-0.12 (0.0797)	-0.09 (0.0675)	-0.10 (0.0785)
Log of Agricultural Exports in percent of Merchandise Exports	0.32 * (0.1775)	0.38 * (0.2060)	0.42 ** (0.2046)	0.42 ** (0.2051)	0.43 ** (0.1814)	0.40 * (0.2104)
Fiscal Balance in percent of GDP	0.02 (0.0392)	0.00 (0.0476)	0.01 (0.0480)	0.01 (0.0473)	0.06 (0.0413)	0.01 (0.0499)
Gross Fixed Capital Formation in percent of GDP	0.19 *** (0.0405)	0.18 *** (0.0469)	0.19 *** (0.0476)	0.18 *** (0.0368)	0.19 *** (0.0342)	0.19 *** (0.0531)
Number of Patent Applications	0.00 (0.0000)	0.00 (0.0000)	0.00 * (0.0000)	0.00 ** (0.0000)	0.00 ** (0.0000)	0.00 (0.0000)
Population Growth	-0.64 ** (0.2538)	-0.77 *** (0.2808)	-0.77 *** (0.2738)	-0.79 *** (0.2817)	-0.73 *** (0.2676)	-0.75 ** (0.4096)
Number of Coup d'etat	-1.02 *** (0.3473)	-0.90 ** (0.4125)	-- --	-- --	-- --	-- --
Number of Crisis Episodes	-0.87 *** (0.2238)	-0.88 *** (0.2335)	-0.85 *** (0.2321)	-0.85 *** (0.2315)	-0.86 *** (0.2255)	-- --
Inflation Rate	0.00 *** (0.0004)	0.00 *** (0.0004)	0.00 *** (0.0005)	0.00 *** (0.0005)	0.00 *** (0.0005)	0.00 *** (0.0004)
Total Trade in percent of GDP	0.00 (0.0048)	0.00 (0.0066)	0.00 (0.0071)	-- --	-- --	0.00 (0.0079)
Trade Balance in percent of GDP	-- --	-- --	-- --	-- --	-0.03 (0.0230)	-- --
Current Account Balance in percent of GDP	-- --	-0.06 (0.0580)	-0.06 (0.0631)	-0.06 (0.0495)	-- --	-0.05 (0.0686)
Adjusted R ²	0.4989	0.5223	0.5021	0.5063	0.4751	0.4287
Number of observations	154	128	128	128	154	128

1/ Data for the independent variables are in levels except for agricultural exports (in percent of merchandise exports), inflation (growth rate), and fiscal balance, gross fixed capital formation, total trade, trade balance and current account balance (in percent of GDP).

2/ ***, **, * refer to 1 percent, 5 percent and 10 percent levels of significance, respectively.

3/ Standard error in brackets.

⁸ While the Hausman test may be used to test for endogeneity and confirm the use of a fixed effects model over a random effects model, it cannot estimate unbalanced data, such as in our data set. Note that in the regressions, Vietnam and Mongolia are dropped from the specifications due to data limitations.

V. CONSTRUCTION OF A GROWTH INDEX

To explore the importance of these determinants at the country level, a growth index is constructed. Unfortunately, an equation such as the one in Table 2 cannot be estimated for individual countries as the degrees of freedom would be too low. However, an analysis of whether the information from the regressions provides a good fit for individual countries can be made by constructing either a relative index or a weighted index. For both indices, the nine variables from specification 3 in Table 2 and the corresponding signs of its coefficients are used.

The relative index assigns scores based on rankings. For indicators with a positive (negative) effect on real per capita GDP, the countries are ranked in ascending (descending) order by their indicator values for a given year. The *country score* for a particular indicator per year is equivalent to its rank. Hence, the highest possible country score for a particular indicator per year is equivalent to the number of countries with available data. Consequently, countries with no available data for a given year are given a score of “0.” The *overall* relative index of a country for a given year is then computed as the total scores (or rankings) for each of the nine variables.

$$(\text{Relative Index of a country})_y = \sum_{i=1}^9 (\text{rank}_{i,y}), \quad \text{where } y = \text{year, 1965-2008}$$

i = variable number, 1-9

The relative index captures well the dynamics of Philippine growth. Table A.16 below shows the cumulative five-year averages of real GDP per capita rankings as well as the computed rankings based on the relative index of the sample. The estimated relative index is consistent with the Philippine growth performance. While the Philippine economic growth has picked up considerably in the last decade, per capita GDP for the most part of the estimation period (early 1980s to the 1990s) was far below the average for East Asia.

It should be noted though that the index value is affected—for some countries—by data limitations. For example, China only has data for the current account balance and the number of patent applications beginning 1981 and 1985, respectively. This automatically gives China a score of “0” for these two indicators for the years without data. Similarly, Vietnam and Mongolia have no data available for the fiscal balance and other countries also have missing data for some indicators in various years.

Given the shortcomings of the relative index, a weighted index is constructed, which uses correlation coefficients as weights and standardized values of the data set. For the variables in specification 3 in Table 2, the values are standardized across countries and across time using the mean and standard deviation of the entire sample.⁹ The correlation of each variable

⁹ To illustrate, for a given country, say Brazil, the average value of the fiscal balance in the entire sample is subtracted from the fiscal balance in Brazil in each year. The resulting value is then divided by the standard deviation of the fiscal balance in the entire sample. Note that alternative methodologies, for example to standardize *across countries per year* or *across time per country*, would yield different results.

with real GDP per capita is then computed for the 23 countries.¹⁰ The weighted index of a country for a given year is computed as the linear combination of the variables using the correlation coefficients as weights. To account for data gaps, the weighted index is divided by the number of available data for that given year.

$$(\text{Weighted Index of a country})_y = \frac{\sum_{i=1}^9 (\text{correlation with real per capita GDP}_i * x_{i,y})}{(\text{number of variables of country } y)},$$

where y = year, 1965–2008
 i = variable number, 1–9
 x = standardized value

In general, the weighted index provides a good fit and suggests that the Philippines did not have sustained periods of above-average improvements in economic fundamentals compared to its counterparts in the region. For the Philippines, the correlation between the real per capita growth rankings and the rankings based on the weighted index is 49 percent, which is above the 47 percent average of all countries (see Table A.16).

However, it is still not an ideal index for all countries. For example, Malaysia scored relatively low especially in the last decade. An explanation for this could be that certain country-specific variables that are important to growth, although to some extent captured in the regression by the initial GDP per capita variable, are not included in the weighted index. Furthermore, the importance of such country-specific factors could change over time, which would not be captured in the regression specification.

In the context of the indicators identified, the Philippines has experienced a gradual relative decline, which is in stark contrast with its Asian counterparts that have high rankings that coincide with the recent resurgence in the region. The rankings of the relative and weighted indices appear to capture that 1984 was indeed a turning point for the Philippines, which is not clear from the actual real GDP per capita rankings. Note that taking the cumulative real GDP growth rates instead (as in Figure 1) shows that the Philippine growth rate declined further starting 1984.

¹⁰ While the coefficients from the regression specifications may seem like the logical choice as weights for the index, such calculations did not yield favorable results. Using the coefficients from the model specifications would entail the use of a uniform weight across countries for a given variable. The weighted index, on one hand, uses varying weights across countries per variable, and thus account for the varying degrees of impact of each regressor for a given country.

VI. CONCLUDING REMARKS

Novel methods are applied to identify which factors have caused the Philippines' growth rate to lag behind its neighbors. Key determinants of per capita GDP growth are investigated in a panel of 23 emerging markets for the period 1965–2008. Splitting the sample into top-performing, moderately growing, and slower-growing countries reveals that the Philippines is an outlier in terms of agricultural exports, investment, research and development, population growth and political uncertainty. Panel regressions reveal that these factors, along with the deficit, inflation, trade openness, the current account balance, and the frequency of crisis episodes are significant determinants of growth. Separate regressions show considerable heterogeneity among the growth determinants in a group of top-performing countries relative to moderately growing and slower-growing countries.

A growth index is constructed that confirms that the determinants found in the panel regressions are also key for both the absolute and relative performance of each emerging market over time. The construction of a growth index focuses on the usefulness of the identified determinants at the country level. The index underscores that the regression is a good fit for the Philippines both in terms of its absolute and relative performance over time. In addition, it accurately dates the turning point when the Philippines started to lag behind. Finally, it also suggests that the Philippines lacked sustained periods of improvement in the key growth determinants, indicative that a strong and persistent period of economic reforms has been absent.

The analysis suggests that to catch up with its East Asian counterparts, the Philippines will need to i) maintain macroeconomic stability, ii) expand its fiscal space, and iii) redirect public spending to agriculture, infrastructure, and research and development.

Expansion of the fiscal space and thus scaling up spending on public investment requires raising tax revenue through both administrative and selective tax policy measures. This would include strengthening tax administration, reform in excise taxes, rationalization of fiscal incentives, and addressing exemptions in value-added taxation.

Better irrigation, access to fertilizers, farm-to-market roads, and storage facilities could support development in the agricultural sector. The government's focus on public-private partnerships (PPP) for traditional and nontraditional infrastructure investments is also beneficial for maximizing the returns to development. Strengthening the focus of education on the sciences in all levels would encourage future researchers and scientists who would be instrumental in nation building.

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APPENDIX

Table A.1 Government Finances (in percent of GDP, unless otherwise noted)

Emerging Markets	Central government balance 1/		Tax revenue 2/		Central government debt 3/		Interest payments (% of revenue) 4/	
	1965-1983	1984-2009	1990	2008	1990	2007	1990	2007
<i>Top-Performing</i>	-3.7	-2.8	13.9	12.8	63.5	55.8	22.6	13.2
<i>Moderately Growing</i>	-6.3	-4.8	15.7	16.0	55.0	60.5	15.7	14.3
<i>Slower Growing</i>	-6.5	-3.1	13.7	17.6	123.2	41.4	63.2	15.4
Philippines	-1.6	-2.8	14.1	14.0	51.3	77.7	40.2	26.5

Source: IMF World Economic Outlook.

1/ Data not available for Mongolia and Vietnam.

2/ Data not available for Mongolia, Thailand, Argentina, Brazil, Chile, Colombia, Morocco, South Africa and Turkey.

3/ Data not available for China, Mongolia, Thailand, Colombia, Egypt, Morocco, South Africa, and Turkey.

4/ Data not available for Vietnam, and China, Thailand, Argentina, Chile, Colombia, Morocco, South Africa and Turkey for 1990.

Table A.2 Capital Formation (in percent of GDP, unless otherwise noted)

Emerging Markets	Gross fixed capital formation		Gross public capital formation 1/		Gross public capital formation, in percent of tax revenue 2/	
	1965-1983	1984-2008	1969-1983	1984-2009	1997	2007
<i>Top-Performing</i>	20.9	27.1	6.4	7.8	83.1	61.9
<i>Moderately Growing</i>	19.9	22.4	8.9	6.3	23.5	27.2
<i>Slower Growing</i>	22.6	19.7	9.5	4.6	27.4	25.5
Philippines	22.6	19.2	...	3.8	30.2	18.3

Source: WB World Development Indicators.

1/ Data for China available 1993, India from 1999, the Philippines from 1986 and Vietnam from 1990.

2/ Data unavailable for Vietnam.

Table A.3 Government Expenditures in Education (in percent of GDP per capita, unless otherwise noted)

Emerging Markets	Public spending on education, total (% of GDP)		Expenditure per student, primary level 1/		Expenditure per student, secondary level 1/		Expenditure per student, tertiary level 1/	
	1970-1983	1984-2007	1998	2007	1998	2007	1998	2007
<i>Top-Performing</i>	3.3	3.9	12.7	12.2	19.1	16.4	46.8	29.6
<i>Moderately Growing</i>	4.3	4.4	16.8	14.7	23.1	21.4	62.1	44.2
<i>Slower Growing</i>	3.1	4.4	11.5	13.2	14.3	15.0	44.2	32.8
Philippines	2.1	3.0	12.6	8.6	10.8	9.1	15.1	11.5

Source: WB World Development Indicators.

1/ Data unavailable for China, Egypt, Indonesia, Pakistan, Sri Lanka and Vietnam.

**Table A.4 Other Government Expenditures for Development
(in percent of GDP, unless otherwise noted)**

Emerging Markets	Research and development expenditure 1/		Information and communication technology expenditure		Roads, paved (% of total roads)	
	1996	2006	2003	2006	1990	2007
<i>Top-Performing</i>	0.3	0.5	5.2	5.8	44.9	59.7
<i>Moderately Growing</i>	0.3	0.5	5.2	5.9	51.2	57.4
<i>Slower Growing</i>	0.4	0.5	5.4	5.8	32.1	33.0
Philippines	0.1	0.1	8.2	9.7	16.6	9.9

Source: WB World Development Indicators.

1/ Available information for the Philippines are for the years 2002 and 2003 only.

2/ Data for Uruguay not available for 1980-1983.

Table A.5 External Indicators 1/

Emerging Markets	Trade balance		Current account balance 2/		Foreign direct investment, net inflows		JP Morgan EMBI sovereign spreads 3/	
	1965-1983	1984-2008	1975-1983	1984-2008	1970-1983	1984-2007	1998	2009
<i>Top-Performing</i>	-0.3	0.1	-2.9	0.1	1.0	2.6	282	163
<i>Moderately Growing</i>	-7.3	-8.7	-7.4	-2.8	0.8	1.8	435	263
<i>Slower Growing</i>	-4.9	-4.1	-2.3	-1.9	0.7	2.1	760	261
Philippines	-5.7	-7.2	-6.1	-1.2	0.4	1.5	498	203

Sources: World Trade Organization, WB World Development Indicators, and Bloomberg.

1/ Data in percent of GDP, except for sovereign spreads.

2/ Data for Vietnam started in 1996.

3/ Data for Indonesia and Uruguay started in 2004 and 2001, respectively, while data series for both Vietnam and Pakistan began in 2005. Data series on Thailand, however, is from 1998-2005 only.

Table A.6 Working Abroad, Emigration, and Tourism

Emerging Markets	Workers' remittances and compensation of employees, received (% of GDP)		Emigration rate of tertiary educated (% of total tertiary educated population)		International tourism, number of arrivals (in millions)		International tourism, receipts (% of total exports)	
	1970-1983	1984-2008	1990	2000	1995	2007	1995	2007
<i>Top-Performing</i>	0.9	2.0	12.2	10.6	5,524,625	13,498,750	7.7	6.2
<i>Moderately Growing</i>	5.6	4.6	11.9	10.0	2,740,571	7,152,571	15.4	16.5
<i>Slower Growing</i>	3.5	3.6	7.6	7.3	4,570,857	6,648,714	10.1	10.0
Philippines	2.3	7.3	12.6	13.5	1,760,000	3,092,000	4.3	9.3

Source: WB World Development Indicators.

Table A.7 Output/Input in Agriculture

Emerging Markets	Agricultural raw materials exports (% of merchandise exports) 1/		Arable land (% of land area)		Arable land (hectares per person)	
	1965-1983	1984-2005	1965-1983	1984-2005	1965-1983	1984-2005
<i>Top-Performing</i>	18.2	5.4	17.7	19.0	0.19	0.13
<i>Moderately Growing</i>	18.3	6.7	15.1	15.4	0.45	0.33
<i>Slower Growing</i>	6.2	2.8	6.3	6.9	0.40	0.30
Philippines	16.1	1.8	16.5	18.5	0.12	0.08

Source: WB World Development Indicators.

1/ 1965-1983 averages are not available for Mongolia and Vietnam.

Table A.8 Employment in Agriculture

Emerging Markets	Agriculture value added per worker (constant 2000 US dollars)		Agricultural employment growth		Employment in agriculture (% of total employment) 1/	
	1965-1983	1984-2005	1965-1983	1984-2005	1980-1983	1984-2007
<i>Top-Performing</i>	586	844	1.4	0.9	41.0	40.0
<i>Moderately Growing</i>	1,062	2,232	0.7	0.5	36.9	30.6
<i>Slower Growing</i>	1,964	2,778	0.3	0.3	13.5	10.1
Philippines	827	938	1.9	1.2	51.9	36.4

Source: WB World Development Indicators.

1/ Data not available for India, and China, Mongolia, Vietnam, Mexico, Morocco, Peru, South Africa and Uruguay between 1980-1983.

Table A.9 Income and Inequality

Emerging Markets	GINI coefficient 1/		Income share held by top income decile 2/		Income share held by fifth and sixth income deciles 2/		Income share held by bottom income decile 2/	
	1987	2006	1981	2006	1981	2006	1981	2006
<i>Top-Performing</i>	43.1	42.2	35.0	32.7	13.8	14.5	2.5	2.7
<i>Moderately Growing</i>	40.3	40.5	30.3	30.3	15.3	15.3	2.8	2.8
<i>Slower Growing</i>	49.7	49.8	38.8	39.7	12.7	12.5	1.8	1.6
Philippines	40.6	44.0	32.7	33.9	14.4	13.7	2.8	2.4

Source: WB World Development Indicators.

1/ Data not available for China, India, Indonesia, Mongolia, Egypt and South Africa.

2/ Data not available for China, India and Indonesia.

Table A.10 Economic Freedom and its Sub-Indices

Emerging Markets	Economic Freedom Index		Trade Freedom Index		Corruption Perception Index		Ease of Doing Business Index	
	1995	2010	1995	2010	1995	2010	1995	2010
<i>Top-Performing</i>	59	59	51	74	35	39	64	60
<i>Moderately Growing</i>	57	61	49	74	36	40	70	71
<i>Slower Growing</i>	61	62	57	76	36	39	70	70
Philippines	55	56	42	78	10	23	55	48

Source: The Heritage Foundation.

Note: The freedom scores for each country is a number between 0-100, with 100 signifying an economic environment or set of policies that is most conducive to economic freedom.

Table A.11 Doing Business Sub-Indices

Emerging Markets	Tax payments (number per year)		Time to comply with company tax obligation (hours per year)		Total tax rate (% profit)	
	2006	2010	2006	2010	2006	2010
<i>Top-Performing</i>	39	32	472	384	47.6	47.7
<i>Moderately Growing</i>	36	34	350	340	52.2	41.9
<i>Slower Growing</i>	31	13	705	637	60.4	58.4
Philippines	48	47	195	195	49.8	49.4

Source: WB Doing Business Report.

Table A.12 Population, Crisis Episodes, Coups, and Colonial Rule

Emerging Markets	Population growth		Crisis episodes		Number of coups (successful and failed)		Number of years under colonial rule
	1965-1983	1984-2008	1965-1983	1984-2008	1965-1983	1984-2010	
<i>Top-Performing</i>	2.2	1.5	1.3	1.6	0.9	-0.8	155
<i>Moderately Growing</i>	2.3	1.7	1.9	2.0	1.4	1.0	135
<i>Slower Growing</i>	2.8	1.9	1.4	2.9	0.7	1.6	237
Philippines	2.8	2.2	3.0	2.0	0	6.0	333

Sources: IMF International Financial Statistics, and IMF Financial Crisis Episodes Database 2008.

List of coup d'etat and coup attempts (en.wikipedia.org)

Table A.13 Education, Research and Development

Emerging Markets	Literacy rate, adult total (% of people ages 15 and above)		Researchers in R&D (per million people) 1/		Scientific and technical journal articles	
	1975-1983	1984-2007	1996	2006	1986	2005
<i>Top-Performing</i>	74.1	85.6	325	657	1,761	7,524
<i>Moderately Growing</i>	55.4	73.0	241	199	258	1,599
<i>Slower Growing</i>	79.4	90.2	512	433	1,002	2,864
Philippines	83.3	93.0	189	141	151	178

Source: WB World Development Indicators.

1/ Data not available for Egypt, Jordan and Pakistan for 2006.

Table A.14 Patent Applications

Emerging Markets	Resident patent applications by patent office 1/		Patent applications by country of origin 2/		Resident patent filings per billion US\$ GDP 3/		Number of resident patent filings per million population 3/		Number of resident patent filings per million US\$ research & development expenditure 4/	
	1965-1983	1984-2008	1995	2008	1995	2007	1995	2007	1995	2007
<i>Top-Performing</i>	308	5,410	1,583	26,313	1.3	4.1	4.5	23.6	0.5	0.7
<i>Moderately Growing</i>	63	199	129	510	5.2	3.1	12.1	13.5	3.2	1.2
<i>Slower Growing</i>	1,323	1,281	2,044	497	1.2	0.8	10.1	10.9	0.3	0.2
Philippines	89	146	169	308	1.0	0.9	2.5	2.7	0.5	0.5

Source: World Intellectual Property Organization (WIPO) Database.

1/ Resident filing refers to an application filed at an Office of or acting for the State in which the first-named applicant in the application concerned has residence.

2/ Country of origin is the residence of the first-named applicant (or assignee).

3/ Data for Jordan and South Africa not available.

4/ Data not available for Jordan and South Africa, and Vietnam and Morocco for 2007.

Table A.15 Competitiveness, Technology and Innovation

Emerging Markets	Global Competitiveness Index (GCI) rankings 1/		Networked Readiness Index (NRI) 2/		Global Innovation Index (GII) 3/	
	2000	2009	2001	2009	2007	2009
<i>Top-Performing</i>	42	47	3.33	4.05	2.96	3.17
<i>Moderately Growing</i>	52	82	3.54	3.66	2.39	2.90
<i>Slower Growing</i>	39	63	3.60	3.69	2.64	2.96
Philippines	46	87	3.27	3.51	2.38	2.89

Sources: World Economic Forum, and Institut Européen d'Administration des Affaires (INSEAD).

1/ The Global Competitiveness Index (GCI) captures the microeconomic and macroeconomic foundations of national competitiveness. Competitiveness is defined as the set of institutions, policies, and factors that determine the level of productivity of a country. Data presented are the average rank of a particular group of emerging markets.

2/ The Networked Readiness Index (NRI) identifies the enabling factors for information and communication technologies (ICT) readiness. A country's NRI score is the simple average of the three composing subindex (environment, readiness and usage) scores.

3/ The Global Innovation Index (GII) was developed to assess countries' ability and preparedness to leverage innovation advances for increased competitiveness and development.

Table A.16 Real GDP Per Capita Indices of Select Emerging Markets

Real GDP Per Capita Growth Rankings ^{1/}										
Country	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2008	
Argentina	3	10	22	23	22	7	15	22	4	
Brazil	1	1	12	17	12	19	21	20	20	
Chile	13	22	19	20	3	4	4	11	21	
China,P.R.: Mainland	8	3	11	1	1	1	1	1	1	
Colombia	14	7	16	18	13	12	23	19	13	
Egypt	16	19	3	5	14	18	7	18	14	
India	21	20	20	11	6	11	3	4	2	
Indonesia	18	4	4	6	8	5	22	6	10	
Jordan	12	23	1	9	23	21	17	9	8	
Malaysia	6	5	7	3	15	3	9	10	16	
Mexico	9	11	15	13	20	13	14	21	23	
Mongolia	5	13	2	2	9	23	10	5	3	
Morocco	22	9	18	16	11	16	20	8	18	
Pakistan	20	21	17	7	4	14	16	15	17	
Peru	17	14	23	19	21	17	11	17	6	
Philippines	15	15	13	21	17	20	12	14	22	
South Africa	10	16	21	15	19	22	18	13	19	
Sri Lanka	11	6	14	4	16	8	6	12	9	
Thailand	2	12	5	8	2	2	19	3	15	
Tunisia	4	2	9	12	18	10	5	7	12	
Turkey	7	8	8	14	7	15	8	16	11	
Uruguay	19	17	10	22	5	9	13	23	5	
Vietnam	23	18	6	10	10	6	2	2	7	

Rankings Based on the Relative Index ^{2/}										
Country	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2008	correlation ^{3/}
Argentina	14	6	9	20	22	16	6	23	19	0.24
Brazil	20	15	20	15	13	14	12	11	15	-0.61
Chile	18	19	12	11	5	3	2	2	4	0.59
China,P.R.: Mainland	12	5	10	10	2	5	4	3	2	0.72
Colombia	13	9	16	13	15	13	21	20	18	0.79
Egypt	7	4	2	8	6	21	11	19	23	0.42
India	9	16	15	18	14	17	20	16	11	-0.27
Indonesia	19	12	13	3	3	4	5	10	10	0.16
Jordan	22	22	21	12	21	8	18	18	16	-0.04
Malaysia	1	1	1	1	4	2	3	8	12	0.78
Mexico	10	17	18	21	19	11	17	5	6	-0.40
Mongolia	23	23	23	22	20	15	7	7	20	-0.24
Morocco	16	11	11	16	9	9	9	9	3	0.18
Pakistan	6	20	17	19	18	19	23	22	22	-0.19
Peru	17	18	19	17	17	22	10	13	9	0.73
Philippines	4	8	4	7	11	10	16	17	21	0.20
South Africa	3	3	3	5	16	20	19	14	7	0.39
Sri Lanka	5	7	8	4	7	7	15	12	17	-0.02
Thailand	11	13	7	2	1	1	1	1	1	-0.07
Tunisia	2	2	6	6	10	6	8	4	5	0.74
Turkey	8	14	14	14	12	18	22	21	14	0.51
Uruguay	15	10	5	9	8	12	14	15	8	0.54
Vietnam	21	21	22	23	23	23	13	6	13	0.52

Rankings Based on the Weighted Index ^{3/}										
Country	1965-1969	1970-1974	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2008	correlation ^{3/}
Argentina	13	11	18	23	23	16	12	23	8	0.83
Brazil	5	7	17	15	18	22	16	11	16	0.71
Chile	20	22	19	20	8	5	3	5	7	0.70
China,P.R.: Mainland	14	13	2	3	3	2	2	1	1	0.37
Colombia	6	4	7	11	9	8	18	15	18	0.66
Egypt	21	20	9	8	5	20	21	20	21	0.55
India	22	23	23	22	20	21	22	18	6	0.59
Indonesia	8	2	5	5	4	6	19	10	10	0.79
Jordan	23	21	6	4	21	10	5	13	9	0.52
Malaysia	1	1	3	2	6	3	9	16	23	0.75
Mexico	18	19	22	21	19	14	17	9	15	-0.46
Mongolia	17	18	20	1	1	4	1	2	3	-0.10
Morocco	15	10	11	17	13	12	11	14	17	0.22
Pakistan	3	17	21	18	16	19	23	21	22	-0.15
Peru	16	14	16	12	22	23	6	7	11	0.50
Philippines	7	6	10	13	11	13	15	12	19	0.49
South Africa	10	8	14	10	15	18	13	6	4	0.54
Sri Lanka	12	12	15	9	14	15	14	17	20	0.39
Thailand	2	3	1	6	2	1	7	8	5	0.49
Tunisia	9	9	8	7	10	9	8	4	12	0.29
Turkey	4	5	13	14	12	17	20	19	14	0.57
Uruguay	11	15	4	19	7	11	10	22	13	0.73
Vietnam	19	16	12	16	17	7	4	3	2	0.80

1/ Countries are ranked in descending order, with "1" as the highest value.

2/ The Relative Index assigns scores based on rankings. One shortcoming of the index is that it automatically assigns a score of '0' for unavailable data in a year. Hence, it is not a good fit for some countries because of data limitations (e.g., China, India, Mongolia and Vietnam).

3/ The Weighted Index uses correlation coefficients as weights and standardized values of the data set, and considers the number of variables available for a given year. It is still not a good fit for some countries because of country-specific factors of growth that are not included in our model (e.g., oil for Malaysia).

4/ The rankings of the index values are correlated with the real GDP per capita rankings for each country. The average for all countries is 25 percent for the relative index and 47 percent for the weighted index.