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Growth Trends in the Developing World:

Country Forecasts and Determinants

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Abstract

The paper presents real per capita GDP growth forecasts for all developing countries for the period 2005-14. For 55 of these countries, representing major world regions and accounting for close to 80% of the developing world's GDP, the paper forecasts the growth effects of the main forces underpinning growth assuming that these evolve following past trends. We find that for the average developing country the largest growth dividend comes from continued improvement in public infrastructure, followed by the growth contributions of rising secondary school enrollment, trade openness, and financial deepening. The joint contribution of these four growth determinants to average, annual per capita GDP growth in the next decade is estimated to be 1 percentage point. Failure to keep improving public infrastructure alone could reduce this growth dividend by 50 percent. The forecasted growth contributions differ by country qualitatively and quantitatively.

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1. Introduction

The paper forecasts growth trends in the developing world, and for a large sample of countries, identifies the main forces likely to underpin growth in the period 2005-14. The paper presents real per capita GDP growth forecasts for all developing countries for the next ten year period. For 55 of these countries,[1] representing all major world regions except Europe and Central Asia and accounting for close to 80% of the developing world's GDP, the paper presents real per capita GDP growth forecasts that reflect the growth effects of various growth determinants assuming that these evolve following past trends.

The forecasting exercise contributes to the literature a collection of econometrically derived country forecasts of real per capita GDP growth for the next decade and all developing countries in the world. Such forecasts are often an input into various types of economic sector work – from debt sustainability analysis to scenario building for macroeconomic and policy modeling exercises, and we could not find a set of growth forecasts of this kind in the literature. The IMF's World Economic Outlook, the World Bank's Unified Surveys and CAS documents publish country growth forecasts for only the next 3 to 5 years, while the World Bank's Global Economic Prospects report presents growth forecasts at the regional, not the country level.

Our analysis, based on a cross country regression framework, suggests that for the average developing country the growth effects of continued improvements in public infrastructure will be larger than those of improved secondary school enrollment, trade openness, and financial deepening. The joint contribution of increases in these growth factors to average, annual real per capita GDP growth in the developing world in the next decade is

[1] We focused on the group of fifty five developing countries, which jointly with twenty three developed countries, is a part of the panel data used by Loayza *et al*. (2005) to estimate the cross-country growth model employed in this study. The rest of the developing countries were not part of the panel data because of missing data on real per capita GDP growth. The bulk of the excluded countries are transition economies, countries that did not exist during the sample period, and very small developing economies.

estimated to be 1 percentage point. Half of this increase is due to the anticipated improvements in public infrastructure.

The forecasts presented in this paper should not be interpreted as predictions but as estimates of economic growth possibilities given a set of assumptions that may not reflect accurately economic conditions in some developing countries and/or may change in the future. The modeling framework can be used as a simulation tool to assess, based on historical averages, how much growth in a country may be affected by changes in the growth indicators included in the model. However, it is important to keep in mind that the tool uses proxies for growth determinants, and changes in these should not be interpreted literally. For instance, although the model uses main phone lines as a proxy for public infrastructure, investment in main phone lines alone will not lead to growth. The value of this type of exercise is in the discipline it generates in obtaining the forecasts and the possibilities it presents for scenario analysis.

We acknowledge that the quality of the growth forecasts depends on the correct specification of the econometric model, the accuracy and future stability of the estimated regression coefficients, and the quality of the forecasts of all explanatory variables. Hence, we have outlined carefully all the assumptions made to produce the growth forecasts and have tested extensively the sensitivity of these forecasts to the model specification and the time horizon of the estimation procedure. Given all this the forecasts presented in this paper should be used together with other pertinent country specific information, such as rigorous analysis of the growth prospects of individual industries and country specific circumstances, to form consensus growth forecasts.

We would like to emphasize that the forecasting model is not a tool that can guide country policy design. Since the cross-country framework used in this paper does not capture policy interactions, does not allow us to sequence policy reforms, identify binding constraints

to growth, discuss policy effectiveness, or identify policies that underpin changes in the growth determinants we restrict our discussion to the growth effects of changes in the indicators representing the growth determinants. A discussion of what policies lead to these changes is beyond the scope of this paper.

Section 2 presents stylized facts about growth and output volatility in the developing world. Section 3 presents the forecasting methodology and the data. Section 4 discusses the forecasts, the performance of the forecasting model, the growth effects of changes in growth determinants, and sensitivity tests. Section 5 offers caveats and concludes this paper.

2. Stylized facts about growth and volatility in the developing world

The average, annual per capita GDP growth rate for the world as a whole has been declining since the 1960s (Table 1B) reflecting to a large extent the declining GDP trend in the developed countries and their influence on the world.

There are some notable differences across developing countries and regions. East Asia grew at the highest growth rate in the last four decades (column 2, Table 1A). With the exception of the 1970s, South Asia grew at the second highest growth rate in the developing world (Table 1B). Other developing regions, including Latin America and the Caribbean, Sub-Saharan Africa, and Middle East and North Africa, have shown much less success in sustaining high growth rates. These three regions had their best growth rates in the 1960s and 1970s, suffered a large decline in the 1980s, and except for Sub-Saharan Africa recovered somewhat in the 1990s.

There are some interesting differences across countries within regions and a number of success stories. In Africa, Botswana is the only country that grew at an average, yearly real per capita GDP growth rate above 1.5% for the past four decades (Table 1A). Uninterrupted civilian leadership, good macroeconomic and fiscal policies, progressive social policies as evidenced by the steep rise in secondary school enrollment (Figure 1), as well as a steady rise

in investment (Figure 1) resulted in an average annual per capita GDP growth rate of 6.3% in the past four decades. In the last decade there was a sharp drop in the output growth partly due to the impact of extremely high HIV/AIDS infection rate (highest in the world), but also due to leveling off in diamond mining production. The rest of the countries in Sub-Saharan Africa grew in the sixties, but most of them slumped into low or negative growth rates in the seventies, eighties and the nineties due to a combination of poor policies, social conflict and negative external shocks.

In East Asia, there are more success stories driven by the booming economies of Japan, the Republic of Korea, Hong Kong (China), Taiwan (China) and Singapore. China leads the group of developing countries in the region whose per capita incomes grew on average above 3% per year over the past 4 decades. After a range of market-oriented reforms were implemented in the late 1970s, trade openness increased (Figure 2), growth accelerated and in the 1980s and 1990s public infrastructure and the economy grew at rates unseen anywhere else in the world (Figure 2, Table 1A).

In the Middle East and North Africa, two economies grew at rates above 3% per year over the past 40 years – Egypt and Tunisia. Egypt's emphasis on education (Figure 3) and its "open" door policies, boosted by sizable increases in foreign direct investment, foreign assistance and workers' remittances, launched the country on a path of high growth in the 1970s. As the impact of these policies faded the government implemented structural and stabilization policies at the end of the 1980s (Figure 3) that led to sustained growth during much of the 1990s. Tunisia's good growth record was a result of sound macroeconomic and public debt management policies, diversified economic base, gradual lessening of government control over economic affairs, steady pace of structural reforms in the 1980s and 1990s, good social policies and political stability.

In South Asia, two economies grew at per capita growth rates above 3 percent in the last two decades – India and Sri Lanka. India benefited from its liberalization efforts, and in the 90s capitalized on its large number of well-educated people to become a leading exporter of services. However, its relatively low ratio of total secondary school enrollment (Figure 3) suggests that the potential gains from future investment in human capital in India could be sizable. Sri Lanka embarked on the path of market-oriented policies and export-oriented trade in the late seventies. Since then economic growth has been healthy due to good macroeconomic management, and steady progress in trade liberalization, privatization, and financial sector reforms.

In Latin America, 15 out of 17 countries on the continent experienced negative growth rates in the 1980s. Chile and Columbia were the exceptions. Chile benefited from initiating reforms earlier than other countries in the region, while Columbia had the best record of macroeconomic stability and external credit worthiness in the region. Most of the continental countries recovered in the 1990s as they conducted strong market-oriented reforms and accomplished economic and political stability.

The Caribbean countries showed less uniform pattern of economic growth. The Dominican Republic, Trinidad and Tobago, Guyana, and Suriname had a similar experience to the continental countries – a sharp drop in economic activity in the 1980s and a recovery in the 1990s. The Bahamas, Barbados, Belize and the small island countries followed a decreasing growth pattern over the past 40 or 30 years. Political instability and economic mis-management doomed Haiti to three decades of negative per capita growth. Jamaica failed to sustain the increase in growth in the 1980s due to crime, frequent banking crises, and rising debt burden.

The developed countries experienced the least output volatility, followed by the countries in South Asia (Table 2B). In both regions output volatility has been declining since

the 1970s – the decade of oil shocks. Although at larger levels of volatility than developed and South Asian countries, a similar declining trend characterizes Africa and the Middle East (Table 2A). After declining over the 1970s and the 1980s, volatility in East Asia increased and surpassed the levels observed in the 1960s. However, while in the 1960s China generated most of the volatility in the region, in the 1990s the responsible parties were the other economies in the region. In Latin America and the Caribbean volatility increased in the poor decade of the 1980s and declined in the decade of recovery (the 1990s). These patterns are similar across countries in the region (Table 2B).

3. Methodology

Our model of choice is the cross-country growth framework which follows the vast empirical literature spawned by the neoclassical growth model. According to the neoclassical model[2] income converges to its steady state as follows:

$$\dot{y} = -\lambda(y - y^*), \qquad (1)$$

where y is real per capita income, y^* is the steady state per capita income, and $\lambda = (1-\alpha)(n+g+\delta)$ is a function of the following exogenous parameters – the capital share α, the rate of population growth n, the rate of growth in technology g, and the rate of capital depreciation δ. Equation (1), which holds for any type of production function, is derived by taking the first order Taylor expansion of the right-hand side of the capital accumulation equation around the steady state and the production function $y=f(k)$, where k is capital K per efficiency unit of labor AL ($k=K/AL$).

[2] Solow (1956) introduced its most basic version, in which the saving rate is exogenous. This assumption can be relaxed if we add explicit household behavior as in an overlapping generations model a la Paul Samuelson and Peter Diamond or in a Ramsey type model with a single, infinitely lived representative consumer. Although the two models can differ substantially, the two approaches yield similar results to the Solow model. In particular, in both models the economy reaches a steady state with a constant saving rate and this steady state has the same characteristics as the steady states in the Solow model. Therefore, for the purpose of studying economic growth, the household behavior is not essential.

Despite its shortcomings[3] and empirical inadequacies,[4] the neoclassical model is useful for explaining *cross country variations in economic growth*. The model fits the evidence that a country's initial level of per capita income is not correlated with its subsequent growth rate, i.e. poor countries do not tend to grow fast relative to developed countries. The model does not predict convergence to the same steady state, but predicts that different countries reach different steady-state levels determined by different growth determinants and external factors, and countries have different rates of growth, depending on each country's initial deviation from its own steady state (Figure 4).

In the last couple of decades, the availability of international data made it possible to conduct cross-country empirical research on economic growth (Barro 1991, 1999; King and Levine 1993; Loayza *et al.* 2005). The typical empirical cross-country regressions follow directly from Solow's equation (1). They have on their left-hand side each country's average growth rate over a long period, while on the right-hand side is a set of variables expected to determine the growth rate:

$$\dot{y} = -\lambda . y + \lambda . y^{*} \qquad (2)$$

The growth rate is diminishing in the initial level of per capita output y given y^{*} and rising in the steady state level of per capita output y^{*} for given y (Figure 4).

The growth equation (2) can also be written in log form as:

[3] The model does not explain the existence of growth without assuming exogenous advances in technology and that different countries use the same production function at a given point in time. Neither of these shortcomings is serious. It is obvious that income per capita grows as knowledge expands. Endogenous growth models address the first shortcoming explicitly. The basic endogenous growth model (the AK model) can be viewed as a limiting case of the neoclassical growth model in which the steady state is independent of saving. While endogenous growth models help explain the existence of worldwide technological progress and offer a more realistic explanation of the process of innovation, there have been few attempts to evaluate these models empirically and use them to explain international differences in growth rates. The second shortcoming is also not serious since one can consider different countries to be at different points along the same production possibilities frontier.

[4] The neoclassical model predicts the rate of convergence, income and rate of return differentials observed in the world only for large values of the capital share. Possible explanations for a large capital share (e.g. two-thirds) include externalities to capital and redefinition of capital income to include not only return to physical capital, but also human capital.

$$\ln y_{it} - \ln y_{it-1} = \alpha \ln y_{it-1} + \lambda' X_{it} + \varepsilon_{it}, \quad (3)$$

where X is the set of variables determining steady state growth y^*, ε is the error term, and subscripts i and t refer to country and time period, respectively. The set of steady state determinants in X typically includes indexes or proxies that represent outcomes of effective structural policies and institutions, stabilization policies, and external conditions. These include indexes reflecting the state of education, financial markets, trade, public sector and governance, macroeconomic conditions, and external factors.

Education has both a direct and indirect positive effect on growth. The direct effect counteracts the diminishing returns on other factors of production and affects long-run growth positively (Lucas, 1988). The indirect effect stems from the fact that human capital is a complement to physical capital, sets the pace for technological innovations, and facilitates technological absorptions (Borensztein *et al*., 1998; Olofsdotter, 1998).

Well functioning markets also promote growth. Developed financial markets promote growth since they facilitate risk diversification, investment and saving, and reduce the incidence of inefficient investment. Openness to trade promotes long-run growth since it leads to increased specialization thereby boosting productivity, expands potential markets allowing local firms to take advantage of economies of scale; facilitates diffusion of technological innovations and base-case managerial practices; and lessens anticompetitive practices and rent-seeking.

The actions of the government affect growth in a number of ways. Inefficient government policies including high taxes, ineffective public programs and large bureaucracy can distort markets, and interfere negatively in the economy by assuming roles most suited for the private sector. Governments' failure to invest in public infrastructure affects negatively long run growth as it lowers productivity and deters investment. Governance encompasses several aspects of institutional quality including respect for civil and political rights,

bureaucratic efficiency, enforcement of contractual agreements, and the prevalence of law and order (Mauro 1995; Knack and Keefer 1995; Barro, 1996; Kaufmann, Kraay and Zoido-Lobaton, 1999). Recent empirical research supports the importance of institutional quality (Easterly and Levine 2003; IMF, World Economic Outlook 2003).

Macroeconomic stability is important for growth. By reducing uncertainty, a stable macroeconomic environment encourages firms to invest, and allows agents to concentrate on productive activities rather than on managing risk. Macroeconomic conditions are represented in cross-country regression models by including indexes measuring price stability, output volatility, real exchange rate overvaluation, the risk of a balance of payment crisis, and systemic banking crises.[5]

Finally, external conditions influence the domestic economy. Terms of trade shocks capture changes in the international demand for countries' exports and the cost of production and consumption inputs. Period-specific changes affecting countries globally summarize prevalent global conditions at a given period of time and reflect worldwide recessions and booms, changes in the allocation and cost of international capital flows, and technological innovations.

We chose the empirical cross-country growth framework from a vast range of forecasting tools.[6] Our choice was motivated by the following reasons. While for some developed countries extrapolations of historical data using log-linear trends can produce surprisingly accurate predictions of current GDP levels (Fatás 2000),[7] Kraay and Monokroussos (1999) find that it is difficult to choose the "best" model for forecasting real

[5] Systemic banking crisis can result from overly contractionary monetary policies and overly expansionary fiscal policies. They may also be a product of an inadequate regulatory framework for financial transactions, which leads to over-lending and unsustainable consumption booms.
[6] We do so despite the belief that empirical growth regressions have been misused through flexible specifications that can lead to any desired result.
[7] For instance, a linear trend model estimated using data from 1880 to 1929 can help predict the GDP level in the U.S. in 2000 with a forecast error of less than 5% (Jones, 1995).

per capita GDP for a particular country or group of countries. Their comparison of the univariate time series model for real per capita GDP and a cross-country growth regression model for a sample of developed and developing countries reveals that neither one clearly dominates as a forecasting tool.

The time series techniques of separating the business cycle from the long-run trend[8] will not allow us to decompose the growth effects of various growth determinants precluding scenario analysis or exercises aimed at assessing for instance the impact of a terms-of-trade shock on growth. Moreover, lack of sufficiently long time series for the transition and newly formed countries precludes the use of this technique for many developing economies.

The IMF production function methodology, which represents the middle ground between a full-scale structural model to determine potential output, and the mechanistic time series models, allows for an explicit growth accounting in terms of the capital, labor and total factor productivity contributions (De Masi 1997), but it too is not appropriate for forecasting developing countries' growth. The data requirements are significant and some variables such as capital stock are difficult to measure and update. Since total factor productivity is not directly observable, estimating its trend poses many of the same challenges and uncertainties as estimating potential output. The existence of large informal labor markets in developing countries implies that the potential input of labor cannot be determined by the behavior of unemployment relative to its natural rate.

For transition economies, the short period of time which has elapsed since the transition process began, combined with the lack of reliable data prior to the beginning of the transition process, preclude using the IMF's standard production function approach, the de-

[8] Examples of such techniques are the segmented-trend approach, the Hodrich Prescott filter, the Baxter-King filter among others. Barrell and Sefton (1995) review the methods for estimating potential output.

trending techniques to estimate potential output growth, or vector autoregressions.[9] The IMF has chosen to construct long term growth scenarios for the transition countries based on the long term growth experiences in other parts of the world.[10] A major shortcoming of this approach is the need to estimate the rate of total factor productivity growth, which typically varies substantially over time and across countries.[11]

Although we could choose from the myriad of cross-country growth regression models in the literature, we adopted the growth framework and forecasting methodology in Loayza *et al.* (2005). The main reason for our choice is the fact that we had access to their panel dataset. It meant that we could avoid the cost of building a large panel data. Another reason is the fact that Loayza *et al.* (2005) employed state-of-the-art panel estimation techniques. Their published forecasts for 20 countries in Latin America and the Caribbean for the period 2001-2010 are already widely used in the World Bank's economic and sector work.[12] Loayza *et al.* (2005) obtain these forecasts by estimating a cross-country growth regression model based on a panel dataset that included 78 countries from various regions in the world (Table 1)[13] spanning the period 1961-99 and then forecasting real per capita GDP growth by generating simple univariate forecasting models for the growth determinants in the model.

Loayza *et al.* (2005) depart from the standard practice and emphasize the importance of differentiating between trend output growth and cyclical output movements (Figure 4). The cyclical output movements are bound to be important in their panel dataset representing

[9] Kraay and Monokroussos (1999) suggest that vector autoregressions in a small set of key macroeconomic variables, estimated country by country, may be a way to improve over the forecast performance of both univariate time series and cross-country growth regression models. The advantage of this approach over the univariate time series models is that it draws on a larger information set. Another advantage is that it relaxes the restrictive assumption of cross-country regression models that the parameters of the model are equal across countries.

[10] See IMF (1996), Chapter 5.

[11] The IMF uses an endogenous growth model to assess the rate of technical change (De Masi 1997).

[12] See, for instance, El Salvador's Country Economic Memorandum 2003.

[13] Table 1 displays the developing countries in the panel data. The developed countries in the panel, not shown in Table 1, are Austria, Australia, Belgium, Canada, Denmark, Finland, France, Greece, Iceland, Ireland, Israel, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, and United States.

relatively short time periods of 5-year averages. In order to account for the cyclical reversion to the trend, they include in the standard growth model (3) the output gap at the start of the period:

$$\frac{\ln y_{it} - \ln y_{it-s}}{s} = \alpha \ln y_{it-s} + \beta(\ln y_{it-s} - \ln y_{it-s}^{T}) + \lambda' X_{it} + \mu_t + \eta_i + \varepsilon_{it}, \qquad (4)$$

where $s=5$ and $\ln y_{it-s} - \ln y_{it-s}^{T}$ is the output gap. They also add a time specific effect μ_t, and a country-specific effect η_i. Controlling for the initial output gap allows them to improve the regression fit and avoid overestimating the speed of transitional convergence. The output gap in the regression is given by the difference between (the log of) potential (trend) and actual GDP per capita around the start of the period. The trend output is obtained using the Baxter-King filter for each country in the sample (Baxter and King, 1999).

The inclusion of the initial output gap in the growth regression model is contentious because with the steady state shifting over time there is no stable long-run trend that can be identified using the filter. We therefore forecast real per capita GDP growth using a pure cross section version of the regression model (4). The model includes all variables representing convergence factors and structural policies mentioned earlier, and only one variable in the category of stabilization policy (inflation). These are the most pertinent to growth over a long time span and the most commonly found in the empirical growth literature.

In this paper we use Loayza *et al.*'s panel data and panel estimates to forecast real per capita GDP growth for the set of all developing countries for the period 2005-14. We do so without having to forecast each of the steady state growth determinants in X.[14] Only for the set of 35 developing countries in Loayza *et al.*'s panel data (the panel contains 55 developing and 23 developed economies), we quantify the growth effects of individual growth

[14] We can do this because the growth model is estimated using averages of the underlying growth determinants in the five year prior to the last year of the current period. Kraay and Monokroussos (1999) use this approach

determinants in X by forecasting their future values using univariate forecasting models and assuming that they evolve following past trends. For the 20 countries in Latin America and Caribbean we cite results from Loayza et al. (2005). Next we discuss the panel data, the estimation methodology, and the forecasting models.

3.1 Data

Loayza *et al*. (2005) estimate cross-country regression (4) using cross-country, time-series panel data, spanning the period 1961-99. The following variables are part of their panel.

Growth per capita (d*lny)* is the log difference of real GDP per capita, represented in 1995 PPP-adjusted US dollars and constructed using Summers and Heston (1991) and World Bank (2002). For the calculation of a period's growth rate, the base corresponds to the final year of the previous period. Initial per capita GDP (*lny*) is the initial value of the ratio of total GDP to total population[15] and is computed using data in Summers and Heston (1991) and the World Bank (2002). Initial output gap (lny-lny^T) is the difference between the log of actual per capita GDP and the log of potential (trend) per capita GDP at the start of the period. The trend per capita GDP is identified using the Baxter-King filter.

The regression includes the following steady state growth determinants in X' (equation 4): education, financial depth, trade openness, government burden, public infrastructure, and governance.

Education is measured as the ratio of total secondary enrollment to the population of the age group that officially corresponds to that level of education. This "flow" variable – used as proxy for human capital in Barro (1991), Mankiw, Romer and Weil (1992), and Easterly (2001) – captures more closely current education policies and human capital investment than "stock" measures related with the educational attainment of the adult

[15] GDP is in 1985 PPP-adjusted US$.

population or life expectancy. The World Bank (2002) is the source for the data on total secondary school enrollment and population of the age group corresponding officially to that level of education.

Financial depth is computed as the ratio to GDP of the stock of claims on the private sector by deposit money banks and other financial institutions from Beck, Demirguc-Kunt and Levine (2000). This measure of financial depth is significantly correlated with other proxies such as the traditional measure of financial depth (M2/GDP). Indicators of other aspects of financial markets, such as the size and activity of the stock markets, can also be used as proxies for financial depth. However, data availability and the fact that incentives to perform efficiently are clearer and stronger for private agents make this measure the preferred proxy for the size and activity of financial markets in recent empirical studies (Levine, Loayza and Beck, 2000).

Trade openness is the residual of a regression of the log of the trade (exports and imports) to GDP ratio on the logs of area and population, and dummies for oil exporting and landlocked countries. The variables in the regression are constructed from data in the World Bank (2002). This structure-adjusted trade openness measure ensures that one would not be attributing to trade policy outcomes resulting from structural country characteristics.[16]

Government burden is measured with the ratio of government consumption to GDP (World Bank, 2002). The rationale for this choice is that current government consumption is devoted mainly to covering the bureaucracy's wage bill. One might argue that not all of government consumption is wasteful as expenditures on health, education and law and order promote growth. Loayza *et al.*, however, did not adjust for these growth promoting

[16] For instance, landlocked countries may trade less than other countries as they face high transport costs. For oil exporters, large trade volumes may co-exist with high import tariffs.

expenditures because they could not find consistent data on these expenditures for a large sample of countries in their panel.[17]

Public infrastructure is measured with the number of telephone mainlines per capita in a country (Canning, 1998). Alternative proxies of public infrastructure are energy generation capacity and transport facilities. Loayza *et al*. (2005) found these to be highly correlated with each other and concluded that results would be quantitatively similar for any of them.

Governance is measured with the first principal components of four indicators from the International Country Risk Guide (ICRG): prevalence of law and order, quality of bureaucracy, absence of corruption, and accountability of public officials. All of them enter with approximately identical weights in their first principal component. There are other measures of governance but these are typically highly correlated with each other. Loayza *et al*. determined that the correlation coefficients between the ICRG index used in their study and the Gastil's index of civil liberties and the Business Environment Risk Intelligence index were 0.79 and 0.85, respectively.

The set of long-run growth determinants *X*' includes the following stabilization indicators: inflation, cyclical volatility, real exchange rate overvaluation, and the number of years in which a country underwent a systemic banking crisis. Inflation – an indicator of macroeconomic stability in many cross-country growth studies[18] – is measured by the consumer price index (World Bank 2002). The inflation rate is positively correlated with other indicators such as fiscal balance (0.24) and black market premiums (0.26) (Loayza *et al.* 2005). Cyclical volatility, which reflects the lack of output stability, is computed as the standard deviation of the output gap for the period. Real exchange rate overvaluation – a measure for external imbalances and the risk of balance-of-payments crises – is given by the

[17] Loayza *et al*. note that the presence of initial GDP per capita and the governance indicator in regression model (4) help to control for the fact that not all government consumption can be regarded as an obstacle to growth.
[18] See Fischer (1993), Easterly, Loayza, and Montiel (1997), Barro (2001), Bekaert, Harvey and Lundblad (2001).

real effective exchange rate, adjusted so that the average for 1976-85 equals Dollar's (1992) index of overvaluation[19] (Source: Easterly 2001). The number of years in which a country underwent a systemic banking crisis as a fraction of the number of years in the corresponding period is computed based on data from Caprio and Klingebiel (1999) and Kaminsky and Reinhart (1998).

The terms of trade shock in the matrix of growth determinants *X*' in model (4) is computed as the log difference of the terms of trade (Source: World Bank 2002). The period-specific shifts μ in model (4) are time dummy variables.

3.2 The forecasting model

The forecasting model used in this study is derived by differencing model (4):

$$\frac{\ln y_{it+s} - \ln y_{it}}{s} = \hat{\alpha}(\ln y_{it} - \ln y_{it-s}) + \hat{\phi}'(G_{it+s} - G_{it}) + \frac{\ln y_{it} - \ln y_{it-s}}{s}, \qquad (5)$$

where *s=10* since we work with 10 year periods, matrix *G* contains the initial output gap, matrix *X*, and the time specific shift; and $\phi = (\beta, \lambda', \mu)$.[20] In general, the forecasting model (5) can be used to forecasts growth for any number of periods of length *s*, where *s* could be any positive integer number. However, using this model to produce growth forecasts for the next 1 to 3 years is not recommended since many of the factors affecting the short term outlook are not included in the model.

Coefficients ($\hat{\alpha}, \hat{\phi}$) were estimated by Loayza *et al.* (2005) using the GMM systems estimator on a 5-year average panel dataset[21] (see last column, Appendix Table 1 and the fourth column, Appendix Table 2). The GMM systems estimator, developed by Arellano and

[19] The Dollar's index of overvaluation gives an idea to what extent the real exchange rate is distorted away from its free-trade level by the trade regime.
[20] As a result of the differencing the country specific term is eliminated from forecasting model (5).
[21] The 5-year panel dataset contains 78 countries – fifty five of them developing – and for each of them, a minimum of 3 and a maximum of 8 non-overlapping 5-year observations (the sample is unbalanced). A minimum of 3 observations per country is required to implement the instrumental –variable methodology for the GMM estimators. The total number of observations equals 350.

Bover (1995) and Blundell and Bond (1997), combines in a system regression model (4) in differences and levels. The regression in differences requires differencing model (4) and using instruments to deal with the likely endogeneity of the independent variables, and the fact that in the differenced model the error term is correlated with one of the explanatory variables – the lagged dependent variable. The instruments consist of previous observations of the explanatory and lagged-dependent variables. The GMM estimator assumes that the error term in model (4) is not serially correlated and the explanatory variables are weakly exogenous. The instruments for the regression in levels are the lagged differences of the corresponding variables. These are appropriate instruments assuming there is no correlation between the differences of the independent variables in model (4) and the country specific effect. This GMM estimator is consistent and efficient.[22]

To test the robustness of the estimates Loayza *et al*. (2005) estimate model (4) using various other estimation techniques. They use the 'pooled' OLS estimator, the 'within' OLS estimator, and the GMM levels estimator for the dynamic model of 5-year and 10-year panel datasets[23] (Appendix Table 1), and the OLS estimator for the pure-cross section model[24] (Appendix Table 2). Each of these alternative techniques has its shortcomings. The 'pooled' OLS estimator ignores the presence of country-specific effects and treats all variables as exogenous, while the 'within' OLS estimator ignores the joint endogeneity of the explanatory variables. The GMM levels estimator uses instruments to control for joint endogeneity but ignores country specific effects.

[22] The consistency of the GMM estimators depends on whether lagged values of the dependent variables are valid instruments in the regression. Loayza *et al.* conducted a Sargent test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process, and tested the null hypothesis for serial correlation of the error term in model (4). The Sargan and serial correlation tests could not reject the null hypothesis of correct specification of the main model.
[23] The sample based on 10-year averages consists of an unbalanced panel of 65 countries and 175 observations.
[24] The sample based on 30-year averages consists of one observation for 70 countries. A country is excluded from the pure cross section sample if there is no complete information for at least 30 years during the period 1966-99.

All estimated coefficients, except governance, are robust to changes in the estimation method (Appendix Table 1). The statistical significance and estimated size of most coefficients are similar across methods. The coefficient on governance changes its sign, but it is not statistically significant. Governance is not statistically significant despite the fact that the governance index has the second largest positive correlation with the growth rate of GDP per capita. This result is robust to changes in the governance index – for instance replacing it with its components, which include indicators on bureaucratic efficiency, corruption, law and order, and accountability or with Gastil's index on civil rights. The result is similar to that of Dollar and Kraay (2003), and contrasts that in Easterly and Levine (2002).

The signs of the estimated coefficients are robust to changes in the time horizon (30-year averages vs. 5-year averages, see Appendix Table 2).[25] However, there are differences in the size and significance of some coefficients. Financial depth and trade openness are not statistically significant in the case of pure cross-section OLS. A possible explanation for the lack of significance is the omission of banking crisis and terms of trade shocks, which control for some negative aspects of financial depth (credit booms) and trade openness (external vulnerability).

Given these differences and the fact that we would like to forecast real per capita GDP using a pure cross-section regression, which resembles most closely the models in the empirical literature and excludes the initial output gap from the set of independent variables, we produce growth forecasts using the pure-cross section version of growth forecasting model (5). In this case, matrix *G* does not include the initial output gap and stabilization policies other than inflation. Coefficients ($\hat{\alpha}, \hat{\phi}$) were estimated by Loayza *et al*. (2005) using the OLS estimator (see second column, Appendix Table 2). We compare the forecasts from the pure

[25] As mentioned earlier, the pure cross-country regression includes trend growth and all variables depicting structural policies and institutions, and one variable in the category of stabilization (inflation).

cross-section model estimated with the OLS estimator with those from the dynamic panel estimated with the GMM estimator below (see Table 5).

4. Growth forecasts

We forecast real per capita GDP growth rates for all developing countries for the period 2005-14 assuming no changes in any of the explanatory variables in matrix *G* of forecasting model (5). Under this assumption transitional convergence is the only factor determining the change in real per capita growth from one period to the next (α=-0.0176). Table 3 displays the country forecasts, which are point estimates representing the most likely growth outcomes, jointly with their 60% confidence bands.[26] From a policy perspective these confidence intervals are more useful than the 90% confidence bands reported in Table 5 since the later are large as is the case for other forecasting models, and most policy analysts are not interested in low probability outcomes.

The confidence intervals are computed by rewriting equation (4) as shown below:

$$\frac{\ln y_{it+s} - \ln y_{it}}{s} = \alpha \ln y_{it} + \varphi' Z_{it+s} + \varepsilon_{it+s}, \qquad (6)$$

and assuming that matrix *Z*, which incorporates all right-hand side variables other than initial income, is a function of non-random variables, and φ, which includes the respective coefficients, is also non-random.

From equation (5) it follows that the variance of the forecast for the next period is:

$$V\left[\frac{\ln y_{it+s} - \ln y_{it}}{s}\right] = V(\varepsilon_{it+s}) = \hat{\sigma}_i^2. \qquad (7)$$

[26] In the case of the 60% confidence bands, we can infer that growth rates higher (lower) than the upper (lower) end of the confidence interval occur with 20% probability.

Using actual and predicted values for growth, we compute the residuals $\hat{\varepsilon}_{it}$ and its variance $V(\hat{\varepsilon}_{it}) = \hat{\sigma}_i^2$.[27] The 60% confidence interval around the forecasted growth rate is then given by $\pm 0.84\sqrt{\hat{\sigma}_i^2}$, while the formula for the 90% confidence interval is $\pm 1.64\sqrt{\hat{\sigma}_i^2}$.[28]

We compute two types of regional averages. The first one reflects weights which represent the share of per capita income in the simple average, regional per capita income. The second one uses weights which reflect economic size and are computed as the share of income in the average regional income. The two measures may differ substantially if the region is dominated by a large country such as China in the case of East Asia and Pacific (Table 3A and Table 4).

For the developing world as a whole we forecast average, annual real per capita growth of 2.2%. We arrive at this growth rate if we use weights which represent the share of per capita income in the simple average, regional per capita income. If we use weights which reflect the size of the economies and are computed as the share of income in the average regional income, the growth rate for the developing world as a whole is 3.5%. This forecast is almost identical to the one published in *Global Economic Prospects* (2004)[29] and shown in Table 4. Even though in two instances (Europe and Central Asia and Sub-Saharan Africa, Table 4) the GEP's regional forecasts are close to ours, in all the other cases they are higher than our estimates implying a growth forecast for the developing world higher than 3.4%.

The forecasts, obtained using the pure cross section version of the forecasting model, are displayed in Table 5. The model excludes the initial output gap and all stabilization policy variables except inflation. Again, we assume that transitional convergence is the only factor

[27] For countries having information on actual and predicted values for growth for no more than one period, $\hat{\sigma}_i^2$ is estimated using the variance of $\hat{\varepsilon}_{it}$ for all countries.

[28] For the average growth rate between $t+sT$ and $t+s(T-1)$ the formula is given by $\pm 1.64\sqrt{\hat{\sigma}_i^2(1+(s\alpha)^2\sum_{k=0}^{T-2}(1+s\alpha)^{2k}}$.

[29] See Table 1.5, pp.43 in *Global Economic Prospects* 2004.

determining the change in real per capita growth (α=-0.024). The forecasts obtained with the pure cross section model are close to those obtained with the dynamic panel model. On average the forecasts differ by 0.12 percentage points, and in only 4 cases they differ by more than 0.5 percentage points. A comparison of the confidence intervals suggests that the dynamic panel model estimated with the GMM estimator provides a better regression fit than the pure cross section model estimated with the OLS estimator.

4.1 Evaluation of the forecasting model

Next we undertake a formal and systematic evaluation of the ex-post performance of forecasting model (5). For this purpose we conduct an out-of-sample and with-in sample forecasting exercises.

4.1.1 Out-of-sample forecasting

The dynamic panel dataset used in the estimation of forecasting model (5) includes data up to 2000, and we use the model to obtain forecasts for 2004. We then compare these forecasts with actual data. We do so using two simple statistics that capture respectively the bias and mean squared error of the forecasts – the cumulative forecast error statistic (CFE) and the Theil-U statistic (TU). Since in this case there is only one period the CFE statistic is given by the following expression:

$$CFE_{it} = \frac{(\hat{y}_{it+5} - y_{it+5})}{y_{it+5}},$$

where $\hat{y}_{it+5}$ is the forecast and y_{it+5} is the actual outcome. The statistic is scaled by the actual outcomes in order to make it comparable across countries. Similarly, the Theil-U statistic, which measures the variability or precision of the forecasts, is defined as follows: [30]

[30] For comparison purposes we compute and report the TU statistics following Kraay and Monokroussos (1999).

$$TU_{it} = \frac{(\hat{y}_{it+5} - y_{it+5})^2}{y_{it+5}^2}.$$

All other things equal, one would prefer forecasting methods with CFE and TU statistics near zero.

For each country, we calculate the CFE and TU statistics and present the results in Table 6. Due to missing data on per capita GDP for the period 2000-2004 for 25 countries the table reports statistics for only 127 developing countries. The countries marked with asterisks belong to the panel used to estimate forecasting model (5). Table 6C shows also the median and the average of the CFE and TU statistics. We compare the medians of the CFE and TU statistics to those computed by Kraay and Monokrousos (1999).[31] They compute CFE and TU statistic for 73 countries and for two types of forecasting models – a univariate time-series model of real per capita GDP and a cross-country growth regression model. The median of the CFE for the growth forecasting model in their forecasting exercise is 0.006 after the first 5 years. This value is very close in absolute terms to the median CFE with forecasting model (5) (-0.007), after the first 5 years. Their median value of the TU statistic for the growth forecasting model is slightly under 0.0002 after the initial 5 years. With forecasting model (5) the median CFE is 0.0001. The average value of the CFE (-0.0084) is slightly larger than the median in absolute value (-0.0070). The average TU statistic is also higher than the median (0.0004) but still relatively small.

The statistics suggest that in the first five years the growth forecasting model performs on average no worse than the growth forecasting model in Kraay and Monokroussos (1999). However, while their growth model tends to overestimate the actual growth rate, the growth forecasting model (5) tends to underestimate the growth rate. Since the cumulative median bias in the level of forecasted real per capita GDP after 5 years is 7% of per capita GDP, the

[31] They report the medians and not the averages since for some countries one model or the other delivered "crazy" forecasts resulting in very large TU or CFE statistics (in absolute value).

downward bias in average annual growth forecasts over this period is around 1.4% per year. The upward bias in Kraay and Monokroussos estimates is of similar order of magnitude.

The statistics for individual countries reveal for which countries the forecasting model performs better or worse than the absolute value of the average cumulative forecast error (0.0084), and the types of the bias. For half of the countries in Table 6 the bias is larger than the average in absolute value. However, half of the countries for which the bias is larger than the average are not part of the panel dataset used to estimate the growth forecasting model (5). The bias is positive in only 38 of the 127 cases. For only 13 of these 38 countries the positive bias is larger than the absolute value of the average (0.0084). The country cases for which forecasting model (5) performs no worse than the average are marked in grey. These are countries for which the absolute value of the CFE is smaller or approximately equal to the absolute value of the average CFE in Table 6.

4.1.2 With-in sample forecasting

One question of interest is whether the model forecasts well changes in growth between decades. In order to answer this question we have compared actual and forecasted changes in growth rates between the 1980s and the 1990s for the 55 developing countries that are part of the panel data used in the estimation of the forecasting model. In 76 percent of the cases the model projects an increase (decrease) when growth accelerated (decelerated) (Table 7). In 44 percent of the cases (marked in grey), the model's forecasted changes in growth are relatively close to the actual changes (less than a percentage point away from the actual change). In nearly half of these cases (marked with asterisks in Table 7), the model performs well both within and out-of sample.

The reasons why in some cases the forecasted changes are very different from the actual ones can be traced to developments not captured in the model. Falling into civil war

and natural disasters impair a country's growth performance in ways that are not captured by the determinants in the model. Conversely, recovering from civil conflict or a natural disaster is bound to have a beneficial impact on growth. For example, Zaire (DRC), Republic of Congo, and Sierra Leone were torn by civil conflicts in the 90s. This effect – not captured in the model – explains why the forecasted growth changes between the two decades in these three countries are positive, while the actual changes are negative. The impact of financial crisis in a country has an effect that spreads to economies in the region and beyond. This effect, also not captured by the model, is a reason why the forecasts for China, Indonesia, and Thailand overestimate the growth change for these countries between the 90s and the 80s. Another reason for the discrepancy between the forecasted and actual changes in the growth rates is that some countries may not be close to the "average" country in the sample.

4.2 Growth effects of public policies

For 55 of the countries in the panel used to estimate model (5), we present a set of real per capita GDP growth forecasts that reflect the growth effects of various factors underpinning long term growth assuming that these growth determinants evolve following past trends.[32] We forecasted the growth determinants in matrix Z of forecasting model (6) by building 280 univariate forecasting models – one model for each of the variables in matrix Z and each of the 35 countries.[33]

We use univariate stochastic trend models with ARMA terms in the case of a unit root (I(1) or I(2)) and deterministic linear trend models with ARMA terms in the case of a stationary variable (I(0)) to forecast the growth determinants.[34] The forecasts of the

[32] Although the panel estimation procedures employed take into account the endogeneity of the various growth determinants (right-hand-side variables), this endogeneity is ignored in this forecasting exercise where the growth determinants are described using simple univariate models.
[33] We forecast only 8 of the 11 variables in matrix Z. For reasons discussed in this section of the paper we leave the other 3 variables unchanged.
[34] The forecasting models are available upon request.

underlying growth determinants for the 20 countries in Latin America and the Caribbean come from Loayza *et al*. (2005).

We test each growth determinant for a unit root, I(1). The unit root tests include a trend implying that the test has unit root as the null hypothesis. This is consistent with the presumption that we 'accept' the null hypothesis of a unit root unless confronted with strong evidence to the contrary. To account for possible heteroskedasticity we compute White heteroskedasticity-consistent standard errors. In most cases the changes to the standard errors were insignificant.

Instead of considering that a variable has a quadratic trend or a unit root plus trend, we consider the more plausible specification that the variable is I(2). It is possible to test whether there is a significant trend in the presence of a unit root. However, such a model is rarely used since it is difficult to justify that the growth rate shrinks or grows in a linear fashion. Often, a naïve curve fitting exercise (ignoring unit roots) will find a quadratic trend term that is significant (and perhaps higher order terms). Although the higher-order trend terms allow you to fit the data better ex post, the model will often perform poorly in out of sample forecasting (Sims, 1999).

A few growth determinants were treated in a different way. We assume that the number of years in which a country underwent a systemic banking crisis remains the same over the next decade. We believe that this is the best we could do given that the occurrence of a banking crisis is difficult to predict even with sophisticated models. Loayza *et al*. (2005) use a more sophisticated technique to forecast this variable,[35] but their technique tends to result in a similar outcome as ours. They estimate low probabilities of new banking crises in countries

[35] They use a panel data model to estimate the probability of crisis based on an index of real exchange rate overvaluation and the previous occurrence of crisis.

that did not have one in the 90s and the early 2000s, and for those that had crises they estimate a gradually decreasing probability of reoccurrence.

We assume that cyclical volatility in the next decade is the same as in the 90s. While we saw that in many countries cyclical volatility declined over the past 4 decades, this trend was not universal and in many countries cyclical volatility increased. Given the difficulties involved in predicting accurately changes in output volatility, we believe that it is best if we leave the cyclical volatility unchanged.

In the case of China, the assumption of continuous trend growth in public investment led to an explosive trajectory – an unlikely trend given historical evidence from other countries. This evidence suggests that the high growth rate of public investment at the initial stages of development eventually slows down and public investment keeps on growing at a declining rate. Public investment in both Korea and Japan exhibited this type of growth patterns. For this reasons we adopted Korea as a benchmark and limited the average growth rate in public investment in China in the period 2005-2014 to the average growth rate in Korea in the period 1982-1992.

Finally, as in Loayza *et al*. (2005) we assume that world growth conditions that determine the period shift will remain approximately the same in the next decade as in the 90s. While this is likely to be untrue, given that world growth conditions have differed notably between decades in the past, it allows us to focus on the contribution of structural and stabilization policies rather than on external conditions that are very difficult to forecast.

Once we obtain the univariate forecast of a growth determinant, we compute the rate of change in the growth determinant's average for the period and multiply it with the corresponding coefficient's estimate in model (5) (displayed in the forth column of Appendix Table 2). This way we arrive at the contribution of the growth determinant to the change in average per capita GDP growth between two consecutive periods 2005-14 and 1995-2004.

Table 8 presents the contribution to growth of all growth determinants in forecasting model (5), and the forecasted per capita growth rates for the 55 countries. The results suggest that for the average developing country the largest growth dividend comes from continued improvements in public infrastructure, followed by the growth contributions of rising secondary school enrollment, trade openness, and financial deepening. The joint contribution of these four growth determinants to average, annual per capita GDP growth in the next decade is estimated to be 1 percentage point (Table 8B). Failure to keep on improving public infrastructure alone could reduce this growth dividend by 50%.

The large estimated contributions of public investment to the forecasted growth changes are due to the large forecasted changes in this growth determinant, not to the size of the estimated coefficient on this variable. The estimated coefficient on public investment is 60 percent smaller than the coefficient on secondary education, 30 percent smaller than the coefficient on trade openness and approximately equal to the coefficient on financial depth (Appendix Table 1).

A comparison of the implied growth rates of the growth determinants also suggests that the results are driven by the projected increases in the respective growth determinants. For instance, the estimated contribution of infrastructure investment to per capita GDP growth of the average country in South Asia is close to 1 percentage point (Table 8B). Such an increase implies an annual, average growth in the investment measure - the number of main telephone lines per capita, of around 27 percent. This growth rate is 10 times the growth rate of secondary school enrollment in the region. The implied yearly growth rates of the investment indicator for the average country in the other regions in Table 8 are between 4 and 5 times the annual growth rates in secondary school enrollment in these regions.

The forecasted growth contributions differ by region and country. For the average developing country in East Asia and Latin America the growth effects of improving trade openness will be larger than those of financial sector deepening. The reverse is the case in South Asia, Sub-Saharan Africa, and the Middle East and North Africa. In these three regions efforts to reduce the government burden will be beneficial to growth. For example, preventing further increases in government consumption could add 0.2 percentage points per year to average real per capita GDP growth in South Asia and Latin America in the next decade.

At the country level, the results in Table 8 allow us to make a number of interesting observations. In China, continued government efforts to improve infrastructure, education, and access to credit and open markets could add up to 2 percentage points to per capita average real GDP growth in the period 2005-2014. Failure to improve public infrastructure alone could lead to a drop in the average per capita real GDP growth rate of a little less than a percentage point.[36]

In India, failure to invest in infrastructure could cost real per capita growth 1.32 percentage points. This will bring down the average, annual real per capita GDP growth rate from 4.90 percent to 3.58 percent over the next decade - a growth rate that is unlikely to lead to a significant drop in the country's poverty rate. Efforts to prevent further increases in the size of the government sector could add a quarter of a percentage point to per capita real output growth.

Nigeria's growth prospects may be dimmed if following past trends the government increases its consumption. We estimate that the negative effect of such an increase on growth cancels out completely the positive effect of all other reform efforts (Table 8A). If Nigeria manages to prevent further increases in the share of government consumption in the country's

[36] Failure to improve infrastructure in China is modeled by assuming that there is no improvement in public infrastructure. In this case, the average per capita real GDP growth rate would fall down by 0.89 percentage points from 8.76% to 7.91%.

GDP its average, annual per capita real growth rate in the period 2005-2014 could increase to more than 2 percent, compared to the expected stagnation in real output per capita under the continuous trend scenario (Table 8A).

In Brazil the greatest growth dividend is expected to come from reducing the probability of banking crises, followed by improvements in macro management and cyclical output volatility. Mexico is another country where continued progress with stabilization policies makes a sizable contribution to growth.[37]

4.3 Sensitivity analysis

As mentioned earlier the estimated coefficients in Loayza *et al*. (2005) (Appendix Table 1) are robust to changes in the estimation method. The signs of the coefficients are also robust to changes in the time horizon: 30 year averages (pure cross section estimation) vs. 5 year averages (dynamic panel estimation). However, there are differences in the size and significance of some of the coefficients (Appendix Table 2). Given these differences and the fact that the pure cross-section regression resembles most closely the models in the empirical literature we test the sensitivity of the growth effects to changes in the time horizon. We estimate the growth effects of the forecasted changes in the underlying growth determinants using the estimated coefficients from the pure cross country regression (shown in the second column of Appendix Table 2) and compare them to the ones obtained using the estimated coefficients from the dynamic panel estimation (5-year averages) (shown in the fourth column of Appendix Table 2).

The main conclusions for the relative importance of the growth determinants at the regional level and for the developing world as a whole remain unchanged (compare Tables 6 and 9). Again we find that the largest growth dividend comes from continued improvement in

[37] See Loayza *et al*. (2005) for a detailed discussion of the results on the countries in Latin America and Caribbean.

public infrastructure, followed by the growth contributions of rising secondary school enrollment, financial deepening, and trade openness. The joint contribution of these four growth determinants to per capita GDP growth in the next decade is estimated at 1 percentage point per year on average. Failure to keep on improving public infrastructure alone could reduce this growth dividend by 70%. The growth contribution of public investment is larger than the one estimated with the dynamic panel model because of the larger estimated coefficient on public investment in the pure cross section model (see Appendix Table 2).

At the regional level, the forecasted growth rates with the pure cross section model are less than half a percentage point away from those obtained with the dynamic panel estimation method.[38] There are some differences at the country level, but these are more than one percentage point for only 18 of the 55 countries, and are associated with a sign change in only 3 cases.

5. Concluding remarks

The paper presents real per capita GDP growth forecasts for all developing countries for the period 2005-2014. For 55 of these countries the paper forecasts the growth effects of the main forces underpinning growth assuming that these evolve following past trends. We find that for the average developing country the largest growth dividend comes from continued improvement in public infrastructure, followed by the growth contributions of rising secondary school enrollment, trade openness, and financial deepening. The joint contribution of these four policy indicators to average, annual per capita GDP growth in the next decade is estimated to be 1 percentage point. Failure to keep on improving public infrastructure alone could reduce this growth dividend by 50 percent.

[38] East Asia and the Pacific region is an exception with the difference slightly more than half a percentage point (0.68).

The forecasted growth contributions differ by region and country. For the average developing country in East Asia and Latin America the growth effects of improving trade openness will be larger than those of financial sector deepening. The reverse is the case in South Asia, Sub-Saharan Africa, and the Middle East and North Africa. In these three regions, efforts to reduce the government burden will be beneficial to growth.

A number of caveats are important. The linear growth model does not capture policy interactions, and does not allow us to sequence policy reforms or identify binding constraints to growth. The methodology does not allow us to differentiate among various policy actions within each of the four policy areas represented in the growth forecasting model and cannot be used to discuss issues of policy effectiveness. The framework is not well suited for modeling the impacts of policy reforms – for instance, tariff cuts and deregulation of the investment regime.

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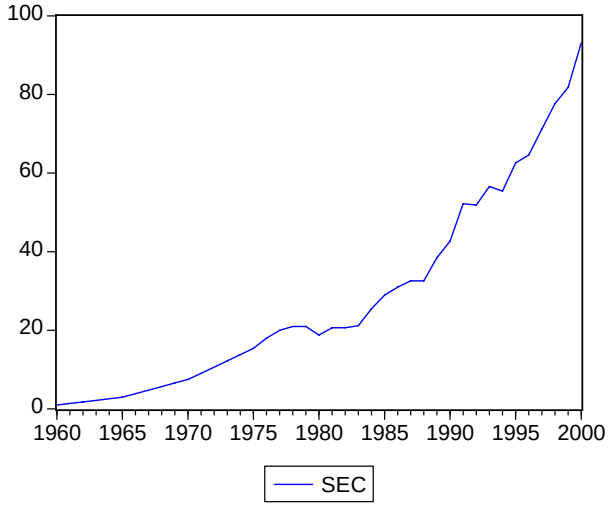
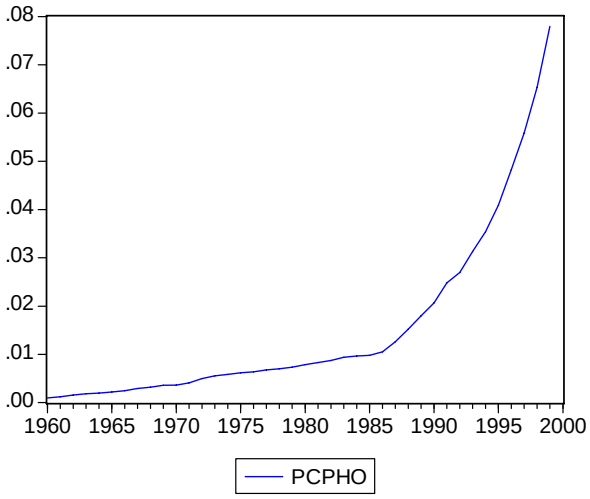
Figure 1. Public investment in human and physical capital in Botswana



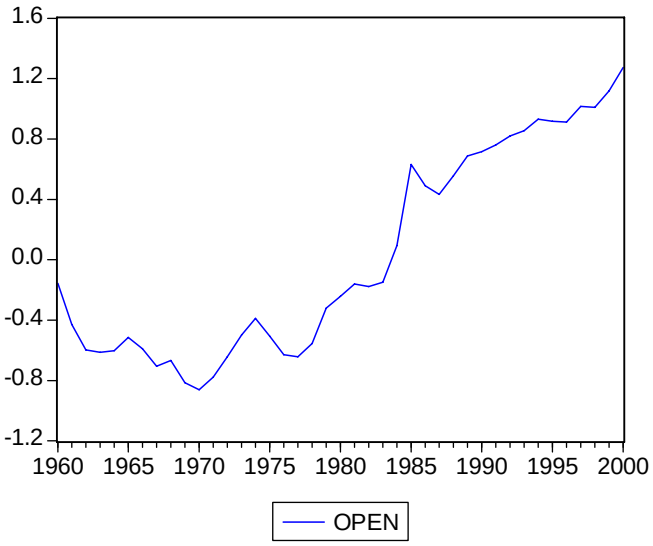
*SEC denotes in percent the ratio of secondary school enrollment to the population of the age group officially corresponding to that age group.



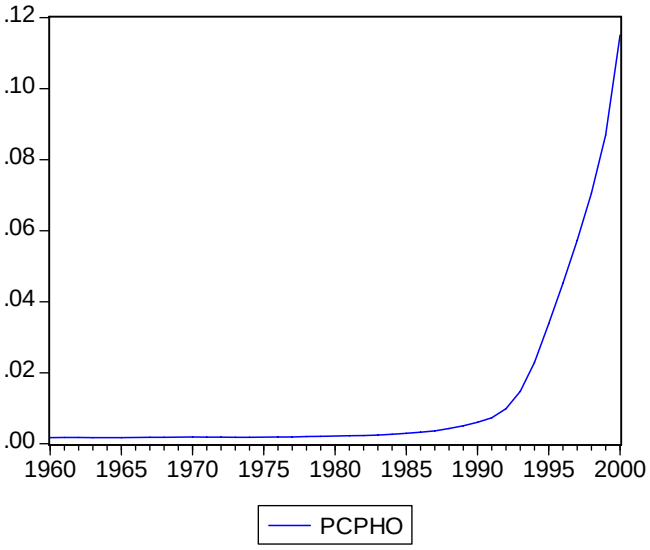
*PCPHO denotes the number of telephone mainlines per capita – a proxy for public infrastructure.

Source: Loayze et al. (2005) panel data.

Figure 2. Trade openness and public infrastructure in China



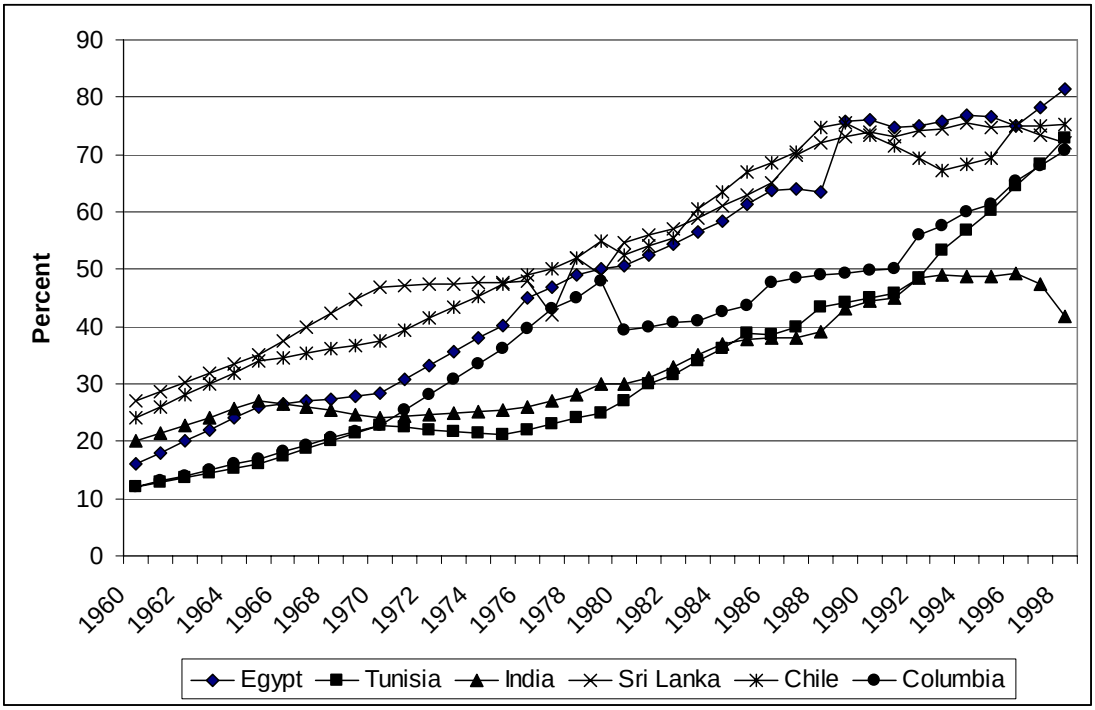
*OPEN denotes trade openness which is defined as the residual of the log of the trade (exports plus imports) to GDP ratio on the logs of area and population, and dummies for oil exporting and landlocked countries.

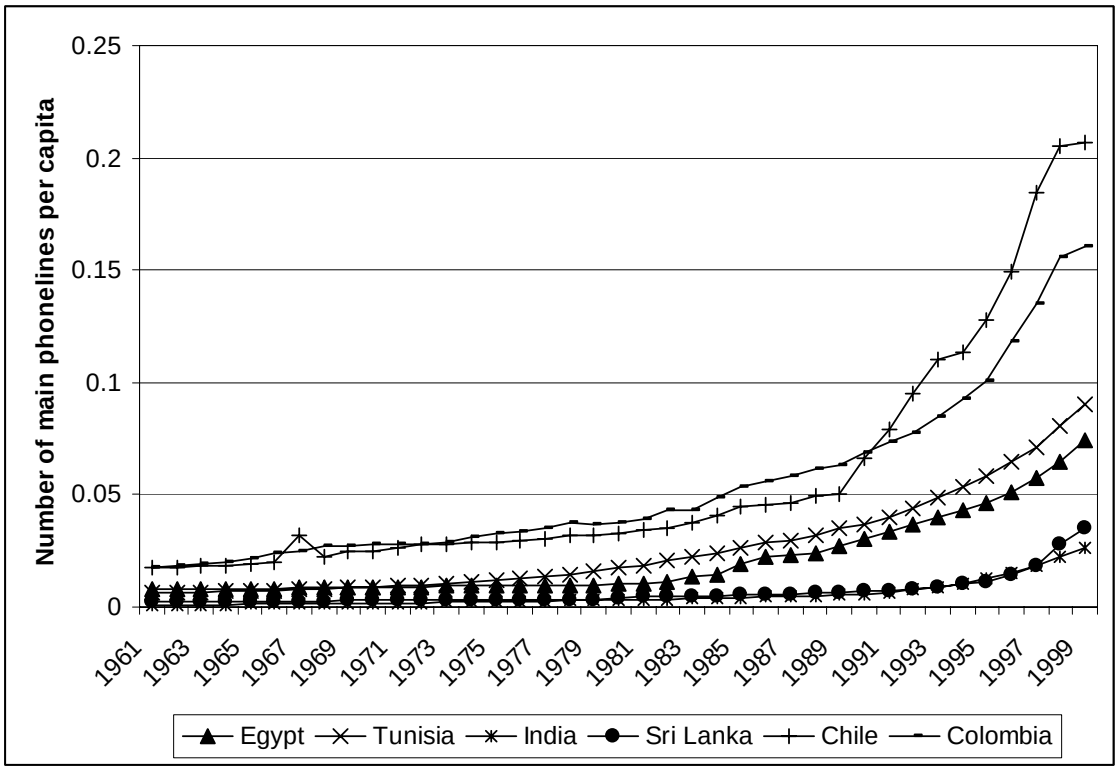


*PCPHO denotes the number of telephone mainlines per capita – a proxy for public infrastructure.

Source: Loayze et al. (2005) panel data.

Figure 3. Public investment in human and physical capital*

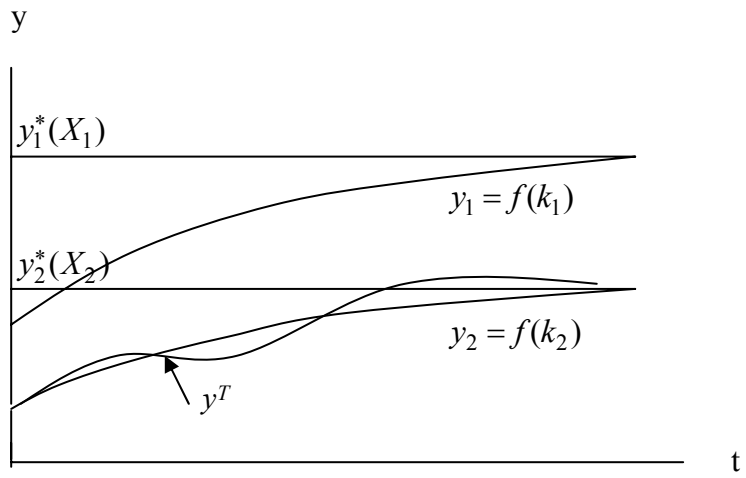




*Public education is proxied with the ratio of total secondary enrollment to the population of the age group that officially corresponds to that level of education. Public infrastructure is proxied with the number of telephone mainlines per capita.

Source: Loayze et al. (2005) panel data.

Figure 4. Convergence to steady state, trend output and cyclical fluctuations*



*y=Y/AL (output per efficiency unit of labor); *k=K/AL* (capital per efficiency unit of labor); y^T is trend output; X is the set of steady-state determinants, which in the Solow's model are the rate of saving and the rate of population growth, but in general include different structural and stabilization policies and external factors.

Table 1A. Average, annual real per capita GDP growth rates

Region/Countries	1961-00	1961-70	1971-80	1981-90	1991-00
Sub-Saharan Africa					
Botswana	6.33	5.42	10.50	6.90	2.48
Burkina Faso	1.25	0.91	1.13	0.83	2.12
Cote d'Ivoire	0.57	4.57	1.18	-2.94	-0.53
DRC (Zaire)	-3.35	0.15	-2.38	-2.31	-8.86
Gambia	0.92	2.29	1.54	-0.15	-0.01
Ghana	-0.21	0.54	-1.86	-1.30	1.78
Kenya	1.23	1.16	4.01	0.59	-0.86
Madagascar	-1.11	0.51	-1.58	-2.18	-1.17
Malawi	1.36	2.10	2.85	-1.01	1.51
Niger	-1.65	0.09	-1.76	-3.27	-1.64
Nigeria	0.32	1.68	1.73	-1.95	-0.19
Republic of the Congo	1.33	1.60	3.41	1.81	-1.50
Senegal	-0.24	-0.77	-1.18	0.26	0.73
Sierra Leone	-1.36	2.45	0.30	-1.23	-6.97
South Africa	0.88	3.71	1.19	-1.16	-0.23
Togo	0.86	5.19	1.93	-2.11	-1.58
Uganda	1.40	0.81	-3.14	4.67	3.26
Zambia	-1.25	0.76	-1.79	-2.01	-1.93
Zimbabwe	0.71	2.82	-0.15	0.69	-0.53
Region	**0.42**	**1.89**	**0.84**	**-0.31**	**-0.74**
Middle East & North Africa					
Algeria	1.29	1.24	4.24	-0.55	0.13
Egypt	3.07	2.78	4.21	2.61	2.63
Iran, Islamic Rep.	1.53	6.19	-2.74	0.85	1.83
Jordan	0.95	-1.62	6.55	-2.78	1.74
Morocco	1.86	2.77	1.92	2.60	-0.03
Syrian Arab Rep.	2.16	1.85	6.16	-1.29	1.88
Tunisia	3.03	3.64	4.34	0.97	3.17
Region	**1.98**	**2.41**	**3.53**	**0.34**	**1.62**
East Asia and Pacific					
China	5.42	1.48	4.22	7.42	8.56
Indonesia	3.51	1.79	5.25	4.34	2.67
Papua New Guinea	1.30	4.31	0.05	-1.29	2.15
Philippines	1.16	1.80	3.02	-0.72	0.54
Thailand	4.51	4.81	3.95	5.82	3.46
Region	**3.18**	**2.84**	**3.30**	**3.11**	**3.48**

Source: Authors' calculations.

Table 1B. Average, annual real per capita GDP growth rates

Region/Countries	1961-00	1961-70	1971-80	1981-90	1991-00
South Asia					
Bangladesh	1.36	1.38	-0.99	2.11	2.94
India	2.30	1.49	0.68	3.51	3.51
Pakistan	2.62	4.18	1.46	3.43	1.40
Sri Lanka	2.88	2.09	2.60	3.03	3.82
Region	**2.29**	**2.28**	**0.94**	**3.02**	**2.92**
Latin America and the Caribbean*					
Antgua and Barbuda	4.09	…	6.93	5.43	1.90
Argentina	0.95	2.31	1.32	-2.99	3.18
Bahamas, The	1.36	3.73	0.70	0.90	0.10
Barbados	2.55	6.00	2.37	0.82	1.03
Belize	2.72	2.27	5.07	2.22	1.32
Bolivia	0.37	0.35	1.67	-1.95	1.40
Brazil	2.45	3.18	5.75	-0.42	1.27
Chile	2.5	1.82	1.22	2.08	4.89
Colombia	1.82	2.21	3.05	1.26	0.74
Costa Rica	1.87	1.93	2.75	-0.32	3.13
Dominica	3.08	…	0.60	5.34	1.56
Dominican Republic	2.74	2.47	4.17	0.31	4.00
Ecuador	1.52	1.24	5.65	-0.47	-0.35
El Salvador	0.73	2.15	-0.18	-1.47	2.40
Grenada	3.69	…	3.97	5.00	2.29
Guyana	0.59	1.26	0.66	-3.90	4.34
Guatemala	1.29	2.56	2.87	-1.62	1.35
Haiti	-0.99	-1.48	2.53	-2.31	-2.70
Honduras	0.79	1.52	2.06	-0.73	0.31
Jamaica	0.47	3.33	-2.12	1.24	-0.56
Mexico	2.11	3.37	3.58	-0.29	1.81
Nicaragua	-0.77	3.36	-2.84	-4.07	0.46
Peru	0.61	2.31	0.84	-2.99	2.28
Paraguay	1.62	1.79	5.69	-0.30	-0.69
Panama	2.02	4.70	1.47	-0.71	2.62
St. Kitts and Nevis	5.26	…	7.14	5.56	4.40
St. Lucia	3.29	…	…	5.34	1.24
St. Vincent and the Grenadines	3.68	…	4.49	4.95	2.17
Suriname	0.95	…	1.81	-1.68	2.90
Trinidad and Tobago	2.52	3.79	5.13	-1.20	2.35
Uruguay	1.13	0.36	2.60	-0.66	2.24
Venezuela, RB	-0.30	1.46	-0.76	-1.75	-0.15
Region	**1.78**	**2.63**	**3.46**	**-0.82**	**1.75**
Developed countries (actual)	**2.68**	**4.28**	**2.50**	**2.42**	**1.68**
Developed countries (trend)	**2.71**	**3.85**	**2.49**	**2.34**	**1.80**
World	**2.76**	**4.15**	**2.68**	**2.29**	**1.90**

Source: Authors' calculations. *The data for the Latin American countries, the averages for the developed countries and the world come from Loayza *et al*. (2005).

Table 2A. Volatility of real per capita output

Region/Countries	1961-00	1961-70	1971-80	1981-90	1991-00
Sub-Saharan Africa					
Botswana	0.0262	0.0218	0.0298	0.0283	0.0147
Burkina Faso	0.0204	0.0182	0.0177	0.0312	0.0123
Cote d'Ivoire	0.0300	0.0367	0.0402	0.0345	0.0347
DRC (Zaire)	0.0355	0.0537	0.0346	0.0218	0.0302
Gambia	0.0323	0.0575	0.0249	0.0207	0.0111
Ghana	0.0289	0.0233	0.0459	0.0273	0.0051
Kenya	0.0305	0.0465	0.0306	0.0156	0.0138
Madagascar	0.0220	0.0154	0.0331	0.0221	0.0110
Malawi	0.0345	0.0447	0.0211	0.0185	0.0373
Niger	0.0415	0.0265	0.0589	0.0506	0.0267
Nigeria	0.0368	0.0837	0.0428	0.0299	0.0124
Republic of the Congo	0.0368	0.0240	0.0484	0.0410	0.0270
Senegal	0.0277	0.0231	0.0366	0.0348	0.0150
Sierra Leone	0.0345	0.0244	0.0145	0.0295	0.0583
South Africa	0.0227	0.0155	0.0309	0.0288	0.0111
Togo	0.0391	0.0316	0.0387	0.0301	0.0560
Uganda	0.0509	0.0192	0.0913	0.0408	0.0159
Zambia	0.0300	0.0422	0.0263	0.0209	0.0311
Zimbabwe	0.0362	0.0350	0.0433	0.0303	0.0391
Region	**0.0324**	**0.0338**	**0.0373**	**0.0293**	**0.0244**
Middle East & North Africa					
Algeria	0.0504	0.0895	0.0496	0.0164	0.0132
Egypt	0.0189	0.0221	0.0289	0.0132	0.0044
Iran, Islamic Rep.	0.0469	0.0345	0.0630	0.0604	0.0191
Jordan	0.0412	0.0411	0.0503	0.0394	0.0347
Morocco	0.0276	0.0322	0.0186	0.0252	0.0353
Syrian Arab Rep.	0.0481	0.0610	0.0613	0.0451	0.0223
Tunisia	0.0216	0.0254	0.0259	0.0215	0.0122
Region	**0.0364**	**0.0437**	**0.0425**	**0.0316**	**0.0202**
East Asia					
China	0.0512	0.0941	0.0250	0.0254	0.0163
Indonesia	0.0258	0.0237	0.0097	0.0150	0.0444
Papua New Guinea	0.0308	0.0178	0.0267	0.0296	0.0442
Philippines	0.0204	0.0061	0.0110	0.0377	0.0144
Thailand	0.0234	0.0125	0.0162	0.0158	0.0407
Region	**0.0303**	**0.0308**	**0.0177**	**0.0247**	**0.0320**

Source: Authors' calculations.

Table 2B. Volatility of real per capita output

Region/Countries	1961-00	1961-70	1971-80	1981-90	1991-00
South Asia					
Bangladesh	0.0294	0.0337	0.0460	0.0096	0.0055
India	0.0194	0.0239	0.0265	0.0137	0.0114
Pakistan	0.0137	0.0202	0.0124	0.0066	0.0121
Sri Lanka	0.0108	0.0139	0.0120	0.0101	0.0058
Region	**0.0183**	**0.0229**	**0.0242**	**0.0100**	**0.0087**
Latin America & the Caribbean*					
Antgua and Barbuda	0.0211	…	0.0231	0.0231	0.0204
Argentina	0.0366	0.0350	0.0319	0.0475	0.0306
Bahamas, The	0.0475	0.0272	0.0888	0.0306	0.0096
Barbados	0.0275	0.0299	0.0313	0.0304	0.0185
Belize	0.0232	0.0063	0.0349	0.0288	0.0143
Bolivia	0.0217	0.0384	0.0127	0.0147	0.0102
Brazil	0.0226	0.0163	0.0244	0.0283	0.0162
Chile	0.0324	0.0161	0.0456	0.0418	0.0196
Colombia	0.0129	0.0076	0.0137	0.0092	0.0189
Costa Rica	0.0205	0.0114	0.0209	0.0244	0.0209
Dominica	0.0387	…	0.0961	0.0200	0.0124
Dominican Republic	0.0319	0.0550	0.0131	0.0271	0.0176
Ecuador	0.0262	0.0159	0.0366	0.0280	0.0230
El Salvador	0.0242	0.0127	0.0330	0.0237	0.0114
Grenada	0.0223	…	0.0174	0.0177	0.0290
Guyana	0.0351	0.0454	0.0311	0.0423	0.0199
Guatemala	0.0129	0.0123	0.0159	0.0149	0.0044
Haiti	0.0262	0.0255	0.0276	0.0108	0.0372
Honduras	0.0200	0.0136	0.0300	0.0167	0.0187
Jamaica	0.0253	0.0200	0.0390	0.0256	0.0086
Mexico	0.0213	0.0158	0.0174	0.0288	0.0240
Nicaragua	0.0438	0.0211	0.0828	0.0281	0.0137
Peru	0.0356	0.0151	0.0185	0.0635	0.0290
Paraguay	0.0204	0.0109	0.0215	0.0324	0.0118
Panama	0.0278	0.0084	0.0207	0.0516	0.0121
St. Kitts and Nevis	0.0263	…	0.0282	0.0331	0.0178
St. Lucia	0.0455	…	…	0.0635	0.0150
St. Vincent and the Grenadines	0.0929	0.0384	0.1867	0.0195	0.0258
Suriname	0.0466	…	0.0318	0.0569	0.0547
Trinidad and Tobago	0.0222	0.0170	0.0264	0.0293	0.0154
Uruguay	0.0291	0.0190	0.0244	0.0465	0.0226
Venezuela, RB	0.0262	0.0205	0.0200	0.0344	0.0278
Region	**0.0302**	**0.0213**	**0.0370**	**0.0310**	**0.0197**
Developed countries	**0.0133**	**0.0114**	**0.0175**	**0.0126**	**0.0096**
World	**0.0241**	**0.0233**	**0.0248**	**0.0218**	**0.0186**

Source: Author's calculations. *The estimates for the Latin American countries, the averages for the developed countries and the world are obtained from Loayza *et al*. (2005).

Table 3A. Forecasts of average, annual real per capita GDP growth rates, 2004-2015

Country/Region	Forecast	60% Confidence Interval***		Country/Region	Forecast	60% Confidence Interval	
Sub-Saharan Africa				**Middle East and North Africa**			
Angola	-0.51	-4.28	3.25	Algeria	1.75	0.24	3.25
Benin	1.45	0.07	2.82	Djibouti	-1.93	-3.57	-0.29
Botswana	2.76	-1.17	6.69	Egypt, Arab Rep.	2.05	-0.79	4.88
Burkina Faso	2.03	0.73	3.34	Iran, Islamic Rep.	2.16	-2.57	6.88
Burundi	-2.12	-4.25	0.00	Iraq	-3.33	-7.14	0.48
Cameroon	1.43	-2.31	5.17	Jordan	0.41	-4.26	5.08
Cape Verde	3.33	-2.24	8.90	Lebanon	0.51	-5.83	6.85
Central Afr. Republic	-0.64	-3.19	1.92	Libya	0.16	-6.59	6.92
Chad	3.73	-0.58	8.05	Morocco	0.37	-1.74	2.48
Comoros	-0.44	-2.91	2.04	Oman	1.31	-10.86	13.48
Congo, Dem. Rep.	-3.96	-8.97	1.05	Syrian Arab Republic	0.97	-1.61	3.55
Congo, Rep.	1.97	-2.21	6.15	Tunisia	2.80	0.51	5.09
Cote d'Ivoire	-0.26	-3.30	2.78	West Bank and Gaza	-5.39	-9.42	-1.35
Equatorial Guinea	11.40	4.03	18.78	Yemen, Rep.	0.86	-3.18	4.90
Eritrea	0.94	-3.10	4.98	**Region***	**1.17**	**-4.39**	**6.72**
Ethiopia	1.60	0.59	2.61	***Region****	***1.66***	***-2.05***	***5.37***
Gabon	-0.54	-2.82	1.74				
Gambia, The	0.97	-0.84	2.78	**East Asia and Pacific**			
Ghana	2.04	-0.44	4.52	American Samoa	0.52	0.03	1.01
Guinea	1.00	-1.86	3.87	Cambodia	2.49	-1.54	6.53
Guinea-Bissau	-2.39	-4.89	0.10	China	6.35	3.71	9.00
Kenya	-0.52	-3.68	2.65	Fiji	1.23	-0.29	2.74
Lesotho	2.75	-1.99	7.50	Indonesia	1.54	-0.60	3.67
Liberia	12.95	-7.90	33.81	Kiribati	2.28	-0.87	5.44
Madagascar	-0.53	-2.28	1.22	Korea, Dem. Rep.	-0.99	-1.38	-0.60
Malawi	1.81	-0.18	3.80	Lao PDR	3.06	1.41	4.71
Mali	2.28	-0.20	4.76	Malaysia	2.34	0.33	4.36
Mauritania	1.74	-1.68	5.16	Marshall Islands	-2.62	-6.34	1.11
Mauritius	3.17	2.98	3.35	Micronesia, Fed. Sts.	-1.76	-6.80	3.29
Mayotte	1.15	-3.40	5.70	Mongolia	2.05	-2.79	6.89
Mozambique	4.11	-1.25	9.46	Myanmar	4.56	1.92	7.19
Namibia	0.35	-3.80	4.51	N. Mariana Islands	0.38	-3.66	4.42
Niger	0.15	-4.25	4.55	Palau	0.23	-3.81	4.27
Nigeria	0.35	-4.06	4.77	Papua New Guinea	-2.05	-6.76	2.66
Rwanda	4.49	-1.10	10.07	Philippines	1.09	-0.24	2.43
Sao Tome and Principe	0.11	-2.37	2.58	Samoa	1.97	-2.07	6.01
Senegal	1.72	0.75	2.69	Solomon Islands	-2.04	-6.54	2.46
Seychelles	1.49	-2.96	5.94	Thailand	1.80	-0.25	3.85
Sierra Leone	-4.76	-8.01	-1.51	Timor-Leste	N.A.	N.A.	N.A.
Somalia	5.65	4.78	6.52	Tonga	0.80	-0.24	1.84
South Africa	0.46	-0.83	1.76	Vanuatu	-2.78	-9.98	4.41
Sudan	3.10	1.20	5.00	Vietnam	4.14	2.16	6.12
Swaziland	0.12	-4.08	4.33	**Region***	**1.41**	**-1.33**	**4.14**
Tanzania	1.58	-0.44	3.59	***Region****	***5.41***	***2.90***	***7.92***
Togo	-0.14	-1.86	1.57				
Uganda	2.87	-0.79	6.52				
Zambia	0.05	-3.17	3.26				
Zimbabwe	-1.80	-5.89	2.28				
Region*	**1.80**	**-1.56**	**5.15**				
Region*	***1.01***	***-1.66***	***3.68***				

Source: Authors' estimates produced with forecasting model (5). *The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004. **The regional average is computed using weights which represent the share of income in the average regional income based on data for 2004.***Note that at the regional level the level of confidence depends on assumptions about the joint distribution of individual country outcomes.

Table 3B. Forecasts of average, annual real per capita GDP growth rates, 2004-2015

Country/Region	Forecast	60% Confidence Interval		Country/Region	Forecast	60% Confidence Interval	
Latin America and Caribbean				**Europe and Central Asia**			
Antigua and Barbuda	1.57	-2.13	5.27	Albania	4.84	-0.13	9.81
Argentina	0.29	-2.43	3.01	Armenia	6.14	2.10	10.18
Barbados	1.70	-1.15	4.54	Azerbaijan	3.67	-0.37	7.71
Belize	-0.81	-5.02	3.40	Belarus	4.71	0.68	8.75
Bolivia	0.67	-0.73	2.06	Bosnia and Herzegovina	12.28	8.24	16.31
Brazil	0.94	-1.73	3.61	Bulgaria	1.48	-1.87	4.82
Chile	2.51	1.12	3.90	Croatia	4.06	0.02	8.10
Colombia	0.04	-1.39	1.47	Czech Republic	2.08	-1.96	6.12
Costa Rica	3.13	0.49	5.77	Estonia	5.35	-0.71	11.41
Cuba	2.23	-1.40	5.85	Georgia	4.31	-6.69	15.31
Dominica	1.28	-0.56	3.13	Hungary	3.57	2.13	5.02
Dominican Republic	2.87	0.18	5.56	Kazakhstan	3.77	-0.27	7.80
Ecuador	0.46	-2.92	3.85	Kyrgyz Republic	2.57	-4.18	9.33
El Salvador	1.04	-0.94	3.03	Latvia	5.08	-2.11	12.27
Grenada	2.99	0.13	5.84	Lithuania	5.14	1.10	9.18
Guatemala	0.71	-0.70	2.11	Macedonia, FYR	0.97	-3.07	5.01
Guyana	1.54	-1.06	4.13	Moldova	0.27	-11.66	12.20
Haiti	-1.43	-3.78	0.93	Poland	3.86	0.08	7.65
Honduras	0.04	-2.18	2.26	Romania	1.60	-3.82	7.03
Jamaica	-0.41	-2.36	1.54	Russian Federation	2.37	1.48	3.27
Mexico	0.93	-0.16	2.01	Serbia & Montenegro	4.30	0.26	8.34
Nicaragua	-1.05	-5.53	3.44	Slovak Republic	3.45	0.03	6.86
Panama	2.41	0.55	4.27	Tajikistan	1.38	1.18	1.58
Paraguay	-0.72	-3.03	1.59	Turkey	1.65	0.25	3.06
Peru	1.36	-0.39	3.11	Turkmenistan	3.22	-5.96	12.39
St. Kitts and Nevis	2.13	-1.92	6.19	Ukraine	0.90	-3.28	5.07
St. Lucia	0.03	-1.98	2.04	Uzbekistan	1.05	-0.99	3.09
St. Vincent and Grenadines	2.82	-2.62	8.26	**Region***	**3.65**	**-0.67**	**7.97**
Suriname	1.60	-1.51	4.71	***Region****	***2.58***	***0.05***	***5.11***
Trinidad and Tobago	4.48	1.43	7.53				
Uruguay	0.31	-1.06	1.68				
Venezuela, RB	-1.58	-4.28	1.11				
Region*	**1.49**	**-1.20**	**4.18**				
Region**	***0.88***	***-1.22***	***2.98***				
Developing world				**South Asia**			
East Asia and Pacific	1.41	-1.33	4.14	Afghanistan	1.13	-4.90	7.16
	5.41	*2.90*	*7.92*	Bangladesh	2.61	0.73	4.49
Europe and Central Asia	3.65	-0.67	7.97	Bhutan	3.00	1.34	4.65
	2.58	*0.05*	*5.11*	India	3.50	2.13	4.87
Latin America and Caribbean	1.49	-1.20	4.18	Maldives	1.98	-2.05	6.02
	0.88	*-1.22*	*2.98*	Nepal	1.10	0.29	1.91
Middle East and North Africa	1.17	-4.39	6.72	Pakistan	1.52	-0.11	3.16
	1.66	*-2.05*	*5.37*	Sri Lanka	2.75	1.06	4.44
South Asia	2.38	0.05	4.72	**Region***	**2.38**	**0.05**	**4.72**
	3.25	*1.80*	*4.70*	***Region*****	***3.25***	***1.80***	***4.70***
Sub-Saharan Africa	1.80	-1.56	5.15				
	1.01	*-1.66*	*3.68*				
Developing world*	**2.16**	**-1.46**	**5.78**				
Developing world**	***3.49***	***1.14***	***5.85***				

*Source: Author's estimates produced with forecasting model (5). *The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004. **The regional average is computed using weights which represent the share of income in the average regional income based on data for 2004.

Table 4. Real GDP per capita, annual average forecasts, 2004-2015

Region	Forecast	60% Confidence intervals	
East Asia and Pacific			
Average*	1.41	-1.33	4.14
Average**	*5.41*	*2.90*	*7.92*
GEP's Average***	5.40		
Europe and Central Asia			
Average*	3.65	-0.67	7.97
Average**	*2.58*	*0.05*	*5.11*
GEP's Average***	3.30		
Latin America and Caribbean			
Average*	1.49	-1.20	4.18
Average**	*0.88*	*-1.22*	*2.98*
GEP's Average***	2.50		
Middle East and North Africa			
Average*	1.17	-4.39	6.72
Average**	*1.66*	*-2.05*	*5.37*
GEP's Average***	2.50		
South Asia			
Average*	2.38	0.05	4.72
Average**	*3.25*	*1.80*	*4.70*
GEP's Average***	4.10		
Sub-Saharan Africa			
Average*	1.80	-1.56	5.15
Average**	*1.01*	*-1.66*	*3.68*
GEP's Average***	1.60		
Developing world			
Average*	**2.16**	**-1.46**	**5.78**
Average**	***3.49***	***1.14***	***5.85***
GEP's Average***	***3.40***		

Source: Author's estimates produced with forecasting model (5) and Global Economic Prospects 2004. *The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004. **The regional average is computed using weights which represent the share of income in the average regional income based on data for 2004. ***Global Economic Prospects 2004, Table 1.5, pp.43.

Table 5A. Average, annual real per capita GDP growth forecasts, 2004-2015 - a comparison

Country/Region	Forecasts with dynamic panel model	90% Confidence Interval		Forecasts with pure cross section model	90% Confidence Interval	
Sub-Saharan Africa	**1.80**	**-4.75**	**8.34**	**1.72**	**-6.21**	**9.65**
Angola	-0.51	-7.87	6.84	0.73	-6.93	8.39
Benin	1.45	-1.25	4.14	1.32	-2.84	5.49
Botswana	2.76	-4.91	10.43	2.51	-5.40	10.42
Burkina Faso	2.03	-0.52	4.58	1.90	-1.34	5.13
Burundi	-2.12	-6.27	2.02	-2.10	-7.67	3.46
Cameroon	1.43	-5.88	8.74	1.32	-6.35	8.98
Cape Verde	3.33	-7.54	14.20	3.15	-8.54	14.83
Central Afr. Republic	-0.64	-5.63	4.36	-0.48	-3.85	2.89
Chad	3.73	-4.69	12.16	3.30	-5.10	11.70
Comoros	-0.44	-5.26	4.39	-0.39	-6.72	5.94
Congo, Dem. Rep.	-3.96	-13.74	5.82	-3.66	-12.59	5.26
Congo, Rep.	1.97	-6.20	10.13	1.94	-12.17	16.06
Cote d'Ivoire	-0.26	-6.19	5.67	-0.03	-9.93	9.86
Equatorial Guinea	11.40	-3.00	25.80	10.16	-7.93	28.26
Eritrea	0.94	-6.95	8.82	1.05	-8.58	10.69
Ethiopia	1.60	-0.37	3.57	1.54	-1.27	4.35
Gabon	-0.54	-4.99	3.90	-0.47	-6.68	5.75
Gambia, The	0.97	-2.56	4.51	0.94	-3.45	5.33
Ghana	2.04	-2.81	6.89	1.94	-5.09	8.96
Guinea	1.00	-4.59	6.59	0.99	-4.80	6.78
Guinea-Bissau	-2.39	-7.27	2.48	-2.22	-8.60	4.17
Kenya	-0.52	-6.70	5.66	-0.46	-4.45	3.53
Lesotho	2.75	-6.51	12.02	2.62	-5.49	10.73
Liberia	12.95	-27.76	53.67	12.67	-36.29	61.64
Madagascar	-0.53	-3.95	2.89	-0.48	-4.13	3.17
Malawi	1.81	-2.08	5.69	1.86	-3.91	7.63
Mali	2.28	-2.57	7.13	2.10	-4.98	9.18
Mauritania	1.74	-4.94	8.42	1.69	-3.29	6.66
Mauritius	3.17	2.80	3.53	2.98	1.87	4.08
Mayotte	1.15	-7.74	10.04	1.19	-7.01	9.39
Mozambique	4.11	-6.35	14.56	3.83	-7.67	15.33
Namibia	0.35	-7.76	8.47	0.34	-10.71	11.39
Niger	0.15	-8.44	8.74	0.14	-10.25	10.53
Nigeria	0.35	-8.27	8.98	0.20	-12.28	12.68
Rwanda	4.49	-6.42	15.39	4.32	-12.51	21.15
Sao Tome and Principe	0.11	-4.72	4.94	0.00	-6.90	6.91
Senegal	1.72	-0.17	3.61	1.59	-0.97	4.14
Seychelles	1.49	-7.20	10.18	1.57	-10.40	13.54
Sierra Leone	-4.76	-11.11	1.59	-5.15	-13.84	3.53
Somalia	5.65	3.94	7.36	5.10	-1.02	11.22
South Africa	0.46	-2.06	2.99	0.40	-3.29	4.09
Sudan	3.10	-0.61	6.81	2.90	1.13	4.68
Swaziland	0.12	-8.09	8.33	0.09	-7.82	7.99
Tanzania	1.58	-2.36	5.51	1.37	-3.04	5.78
Togo	-0.14	-3.49	3.21	-0.06	-6.03	5.90
Uganda	2.87	-4.27	10.00	2.72	-5.29	10.74
Zambia	0.05	-6.23	6.32	-0.07	-8.25	8.12
Zimbabwe	-1.80	-9.79	6.18	-1.39	-10.44	7.66

Source: Authors' estimates produced with forecasting model (5). The regional averages are computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 5B. Average, annual real per capita GDP growth forecasts, 2004-2015 - a comparison

Country/Region	Forecasts with dynamic panel model	90% Confidence Interval		Forecasts with pure cross section model	90% Confidence Interval	
Middle East & North Africa	**1.17**	**-9.67**	**12.01**	**1.06**	**-11.62**	**13.74**
Algeria	1.75	-1.19	4.69	1.61	-2.87	6.08
Djibouti	-1.93	-5.14	1.27	-1.92	-2.20	-1.64
Egypt, Arab Rep.	2.05	-3.48	7.58	1.93	-3.85	7.71
Iran, Islamic Rep.	2.16	-7.08	11.39	1.92	-9.06	12.90
Iraq	-3.33	-10.76	4.10	-2.93	-12.55	6.69
Jordan	0.41	-8.70	9.53	0.34	-10.82	11.50
Lebanon	0.51	-11.87	12.89	0.43	-18.80	19.66
Libya	0.16	-13.03	13.36	0.09	-20.64	20.82
Morocco	0.37	-3.75	4.50	0.28	-5.60	6.16
Oman	1.31	-22.45	25.07	1.19	-22.22	24.60
Syrian Arab Republic	0.97	-4.07	6.00	0.96	-6.07	7.98
Tunisia	2.80	-1.67	7.27	2.63	-2.00	7.26
West Bank and Gaza	-5.39	-13.27	2.50	-4.56	-14.19	5.08
Yemen, Rep.	0.86	-7.03	8.74	0.82	-8.81	10.46
East Asia and Pacific	**1.41**	**-3.93**	**6.74**	**1.30**	**-5.43**	**8.02**
American Samoa	0.52	-0.43	1.47	0.52	-0.34	1.37
Cambodia	2.49	-5.39	10.38	2.26	-7.38	11.89
China	6.35	1.19	11.52	5.95	1.46	10.44
Fiji	1.23	-1.73	4.19	1.18	-3.64	6.01
Indonesia	1.54	-2.63	5.71	1.40	-3.77	6.57
Kiribati	2.28	-3.87	8.44	2.30	-6.75	11.34
Korea, Dem. Rep.	-0.99	-1.75	-0.23	-0.96	-2.92	1.00
Lao PDR	3.06	-0.17	6.29	2.84	-0.68	6.36
Malaysia	2.34	-1.59	6.27	2.20	-3.21	7.61
Marshall Islands	-2.62	-9.89	4.66	-2.62	-13.78	8.53
Micronesia, Fed. Sts.	-1.76	-11.61	8.10	-1.77	-14.90	11.36
Mongolia	2.05	-7.39	11.49	1.94	-12.67	16.55
Myanmar	4.56	-0.59	9.70	4.28	-2.74	11.30
N. Mariana Islands	0.38	-7.50	8.27	0.38	-9.25	10.02
Palau	0.23	-7.65	8.11	0.21	-9.42	9.85
Papua New Guinea	-2.05	-11.25	7.15	-1.93	-10.58	6.73
Philippines	1.09	-1.51	3.69	0.99	-1.47	3.44
Samoa	1.97	-5.91	9.86	1.80	-7.84	11.43
Solomon Islands	-2.04	-10.82	6.75	-1.58	-10.30	7.14
Thailand	1.80	-2.20	5.80	1.58	-4.00	7.16
Timor-Leste	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Tonga	0.80	-1.24	2.84	0.63	-2.59	3.85
Vanuatu	-2.78	-16.83	11.26	-2.67	-22.06	16.72
Vietnam	4.14	0.28	8.01	3.87	-1.46	9.20
South Asia	**2.38**	**-2.18**	**6.94**	**2.22**	**-2.59**	**7.02**
Afghanistan	1.13	-10.64	12.90	0.73	-6.93	8.39
Bangladesh	2.61	-1.07	6.28	2.43	-0.15	5.01
Bhutan	3.00	-0.24	6.23	2.76	0.75	4.76
India	3.50	0.83	6.17	3.29	-0.03	6.60
Maldives	1.98	-5.90	9.87	1.85	-7.78	11.49
Nepal	1.10	-0.48	2.69	1.04	-1.69	3.76
Pakistan	1.52	-1.66	4.71	1.45	-1.98	4.88
Sri Lanka	2.75	-0.56	6.06	2.62	-0.89	6.12

*Source: Authors' estimates produced with forecasting model (5). The regional averages are computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 5C. Average, annual real per capita GDP growth forecasts, 2004-2015 - a comparison

Country/Region	Forecasts with dynamic panel model	90% Confidence Interval		Forecasts with pure cross section model	90% Confidence Interval	
Latin America & Caribbean	**1.49**	**-3.76**	**6.74**	**1.44**	**-5.19**	**8.07**
Antigua and Barbuda	1.57	-5.65	8.80	1.53	-6.72	9.77
Argentina	0.29	-5.02	5.60	0.42	-5.48	6.32
Barbados	1.70	-3.85	7.24	1.69	-5.97	9.36
Belize	-0.81	-9.03	7.41	-1.11	-11.67	9.46
Bolivia	0.67	-2.05	3.39	0.65	-2.43	3.73
Brazil	0.94	-4.28	6.16	0.90	-4.18	5.98
Chile	2.51	-0.20	5.23	2.38	-0.40	5.16
Colombia	0.04	-2.76	2.84	-0.02	-3.17	3.12
Costa Rica	3.13	-2.02	8.28	3.12	-1.92	8.15
Cuba	2.23	-4.85	9.30	2.08	-7.95	12.11
Dominica	1.28	-2.32	4.89	1.40	-2.74	5.54
Dominican Republic	2.87	-2.38	8.12	2.78	-6.01	11.56
Ecuador	0.46	-6.15	7.08	0.36	-6.56	7.29
El Salvador	1.04	-2.83	4.91	1.03	-4.78	6.85
Grenada	2.99	-2.58	8.56	2.91	-4.27	10.09
Guatemala	0.71	-2.03	3.45	0.71	-2.56	3.98
Guyana	1.54	-3.53	6.60	1.56	-4.27	7.39
Haiti	-1.43	-6.01	3.16	-1.27	-6.54	3.99
Honduras	0.04	-4.30	4.37	-0.01	-6.33	6.30
Jamaica	-0.41	-4.21	3.40	-0.46	-4.66	3.74
Mexico	0.93	-1.19	3.05	0.89	-2.24	4.02
Nicaragua	-1.05	-9.81	7.71	-1.07	-8.97	6.82
Panama	2.41	-1.22	6.04	2.37	-4.46	9.20
Paraguay	-0.72	-5.23	3.79	-0.62	-4.28	3.04
Peru	1.36	-2.06	4.77	1.27	-1.64	4.18
St. Kitts and Nevis	2.13	-5.79	10.05	2.08	-8.13	12.30
St. Lucia	0.03	-3.90	3.95	0.09	-5.44	5.61
St. Vincent & Grenadines	2.82	-7.79	13.43	2.72	-15.08	20.51
Suriname	1.60	-4.48	7.68	1.46	-4.77	7.70
Trinidad and Tobago	4.48	-1.48	10.43	4.17	-2.57	10.90
Uruguay	0.31	-2.36	2.98	0.45	-4.78	5.68
Venezuela, RB	-1.58	-6.85	3.68	-1.38	-7.51	4.76

*Source: Authors' estimates produced with forecasting model (5). The regional averages are computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 5D. Average, annual real per capita GDP growth forecasts, 2004-2015 - a comparison

Country/Region	Forecasts with dynamic panel model	90% Confidence Interval		Forecasts with pure cross section model	90% Confidence Interval	
Europe and Central Asia	**3.65**	**-4.78**	**12.08**	**3.31**	**-7.38**	**14.01**
Albania	4.84	-4.86	14.54	4.53	-10.26	19.31
Armenia	6.14	-1.74	14.02	5.57	-4.06	15.21
Azerbaijan	3.67	-4.22	11.55	3.10	-6.53	12.74
Belarus	4.71	-3.17	12.60	4.29	-5.34	13.93
Bosnia and Herzegovina	12.28	4.39	20.16	12.09	2.45	21.72
Bulgaria	1.48	-5.05	8.00	1.14	-10.63	12.91
Croatia	4.06	-3.82	11.95	3.83	-5.80	13.47
Czech Republic	2.08	-5.80	9.97	1.90	-7.74	11.53
Estonia	5.35	-6.48	17.18	4.92	-14.30	24.13
Georgia	4.31	-17.16	25.78	3.93	-27.37	35.23
Hungary	3.57	0.75	6.39	3.35	-2.32	9.02
Kazakhstan	3.77	-4.12	11.65	3.18	-6.46	12.81
Kyrgyz Republic	2.57	-10.61	15.76	2.41	-12.69	17.51
Latvia	5.08	-8.96	19.12	4.67	-13.76	23.10
Lithuania	5.14	-2.75	13.02	4.77	-4.87	14.40
Macedonia, FYR	0.97	-6.91	8.85	0.92	-8.71	10.56
Moldova	0.27	-23.03	23.56	0.03	-29.73	29.80
Poland	3.86	-3.53	11.26	3.67	-6.71	14.05
Romania	1.60	-8.98	12.19	1.34	-4.91	7.59
Russian Federation	2.37	0.62	4.12	1.97	0.76	3.18
Serbia and Montenegro	4.30	-3.58	12.19	4.01	-5.63	13.64
Slovak Republic	3.45	-3.22	10.11	3.24	-10.22	16.70
Tajikistan	1.38	1.00	1.77	0.91	-4.46	6.28
Turkey	1.65	-1.09	4.40	1.54	0.65	2.42
Turkmenistan	3.22	-14.71	21.14	2.37	-8.60	13.34
Ukraine	0.90	-7.26	9.05	0.42	-6.60	7.44
Uzbekistan	1.05	-2.93	5.03	0.92	-6.17	8.01
Regions						
East Asia and Pacific	1.41	-3.93	6.74	1.30	-5.43	8.02
Europe and Central Asia	3.65	-4.78	12.08	3.31	-7.38	14.01
Latin America and Caribbean	1.49	-3.76	6.74	1.44	-5.19	8.07
Middle East and North Africa	1.17	-9.67	12.01	1.06	-11.62	13.74
South Asia	2.38	-2.18	6.94	2.22	-2.59	7.02
Sub-Saharan Africa	1.80	-4.75	8.34	1.72	-6.21	9.65
Developing world	**2.16**	**-4.19**	**9.23**	**1.99**	**-6.69**	**10.67**

*Source: Authors' estimates produced with forecasting model (5). The regional averages are computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 6A. Evaluating forecast performance

Country	Real GDP per capita (in logs) 1995	Real GDP per capita (in logs) 2000	Forecasted Real GDP per capita (in logs) 2004	Actual Real GDP per capita (in logs) 2004	Cumulative Forecast Error Statistic CFE	Theil-U Statistic TU
Albania	8.07	8.29	8.49	8.43	0.0069	0.0000
Algeria*	8.51	8.60	8.69	8.70	-0.0018	0.0000
Angola	7.54	7.61	7.67	7.67	0.0009	0.0000
Antigua and Barbuda	9.10	9.08	9.07	9.22	-0.0163	0.0003
Argentina*	9.35	9.22	9.10	9.37	-0.0292	0.0009
Armenia	7.64	8.05	8.43	8.27	0.0193	0.0004
Azerbaijan	7.62	8.05	8.44	8.26	0.0222	0.0005
Bangladesh*	7.22	7.35	7.46	7.46	0.0001	0.0000
Belarus	8.33	8.56	8.77	8.76	0.0011	0.0000
Belize	8.41	8.66	8.90	8.73	0.0189	0.0004
Benin	6.77	6.89	6.99	6.95	0.0059	0.0000
Bolivia*	7.68	7.70	7.72	7.83	-0.0135	0.0002
Bosnia and Herzegovina	8.45	8.56	8.67	8.79	-0.0138	0.0002
Botswana*	8.73	8.89	9.04	9.06	-0.0023	0.0000
Brazil*	8.80	8.82	8.84	8.95	-0.0121	0.0001
Bulgaria	8.58	8.82	9.04	8.91	0.0149	0.0002
Burkina Faso*	6.85	6.93	7.01	7.03	-0.0030	0.0000
Burundi	6.34	6.30	6.27	6.44	-0.0263	0.0007
Cambodia	7.35	7.55	7.74	7.68	0.0077	0.0001
Cameroon	7.41	7.49	7.57	7.59	-0.0031	0.0000
Cape Verde	8.38	8.48	8.58	8.57	0.0004	0.0000
Central African Republic	6.96	6.85	6.75	6.95	-0.0288	0.0008
Chad	6.72	6.96	7.17	7.66	-0.0638	0.0041
Chile*	9.00	9.09	9.17	9.27	-0.0106	0.0001
China*	8.11	8.38	8.62	8.53	0.0105	0.0001
Colombia*	8.63	8.68	8.73	8.79	-0.0074	0.0001
Comoros	7.37	7.33	7.30	7.45	-0.0204	0.0004
Congo, Dem. Rep.*	6.58	6.37	6.18	6.48	-0.0454	0.0021
Congo, Rep.*	6.75	6.71	6.68	6.82	-0.0202	0.0004
Costa Rica*	9.05	9.02	8.99	9.11	-0.0136	0.0002
Cote d'Ivoire*	7.33	7.15	6.99	7.21	-0.0311	0.0010
Croatia	9.00	9.18	9.34	9.33	0.0013	0.0000
Czech Republic	9.43	9.57	9.70	9.79	-0.0098	0.0001
Djibouti	7.53	7.53	7.53	7.57	-0.0054	0.0000
Dominica	8.57	8.46	8.36	8.55	-0.0224	0.0005
Dominican Republic*	8.59	8.67	8.75	8.82	-0.0085	0.0001
Ecuador*	8.01	8.07	8.13	8.19	-0.0073	0.0001
Egypt, Arab Rep.*	8.05	8.14	8.22	8.24	-0.0025	0.0000
El Salvador*	8.36	8.38	8.39	8.47	-0.0101	0.0001
Eritrea	6.78	6.72	6.67	6.90	-0.0331	0.0011
Estonia	9.06	9.36	9.64	9.46	0.0192	0.0004
Ethiopia	6.40	6.43	6.46	6.62	-0.0242	0.0006
Fiji	8.47	8.48	8.48	8.64	-0.0177	0.0003
Gabon	8.62	8.58	8.55	8.73	-0.0217	0.0005
Gambia, The*	7.33	7.31	7.28	7.53	-0.0328	0.0011

Table 6B. Evaluating forecast performance

Country	Real GDP per capita (in logs) 1995	Real GDP per capita (in logs) 2000	Forecasted Real GDP per capita (in logs) 2004	Actual Real GDP per capita (in logs) 2004	Cumulative Forecast Error Statistic CFE	Theil-U Statistic TU
Georgia	7.42	7.71	7.98	7.92	0.0075	0.0001
Ghana*	7.50	7.57	7.63	7.67	-0.0047	0.0000
Grenada	8.73	8.76	8.79	8.90	-0.0123	0.0002
Guatemala*	8.18	8.18	8.19	8.26	-0.0094	0.0001
Guinea	7.50	7.53	7.55	7.60	-0.0065	0.0000
Guinea-Bissau	6.54	6.38	6.24	6.50	-0.0410	0.0017
Guyana	8.24	8.20	8.17	8.29	-0.0146	0.0002
Haiti*	7.35	7.26	7.18	7.35	-0.0233	0.0005
Honduras*	7.72	7.75	7.77	7.87	-0.0125	0.0002
Hungary	9.31	9.45	9.57	9.64	-0.0070	0.0000
India*	7.69	7.84	7.97	7.97	0.0006	0.0000
Indonesia*	7.91	7.98	8.05	8.11	-0.0073	0.0001
Iran, Islamic Rep.*	8.56	8.73	8.89	8.85	0.0045	0.0000
Jamaica*	8.12	8.20	8.27	8.20	0.0079	0.0001
Jordan*	8.19	8.23	8.27	8.35	-0.0101	0.0001
Kazakhstan	8.22	8.65	9.04	8.84	0.0224	0.0005
Kenya*	6.85	6.80	6.75	6.89	-0.0200	0.0004
Kyrgyz Republic	7.22	7.31	7.39	7.49	-0.0135	0.0002
Lao PDR	7.22	7.41	7.58	7.49	0.0118	0.0001
Latvia	8.79	9.07	9.32	9.32	0.0005	0.0000
Lebanon	8.28	8.39	8.49	8.50	-0.0010	0.0000
Lesotho	7.58	7.74	7.88	7.78	0.0127	0.0002
Lithuania	8.95	9.19	9.41	9.40	0.0012	0.0000
Macedonia, FYR	8.66	8.68	8.69	8.71	-0.0019	0.0000
Madagascar*	6.61	6.56	6.51	6.67	-0.0240	0.0006
Malawi*	6.32	6.29	6.26	6.37	-0.0182	0.0003
Malaysia	8.94	9.04	9.13	9.11	0.0021	0.0000
Mali	6.59	6.76	6.92	6.86	0.0088	0.0001
Mauritania	7.42	7.41	7.39	7.64	-0.0318	0.0010
Mauritius	9.06	9.19	9.31	9.31	-0.0002	0.0000
Mexico*	8.96	8.98	9.00	9.11	-0.0124	0.0002
Moldova	7.08	7.18	7.27	7.39	-0.0163	0.0003
Mongolia	7.17	7.31	7.44	7.54	-0.0142	0.0002
Morocco*	8.08	8.16	8.23	8.26	-0.0032	0.0000
Mozambique	6.70	6.89	7.07	7.04	0.0045	0.0000
Namibia	8.60	8.62	8.64	8.70	-0.0068	0.0000
Nepal	7.07	7.12	7.16	7.23	-0.0087	0.0001
Nicaragua*	7.66	7.69	7.72	8.05	-0.0399	0.0016
Niger*	6.58	6.58	6.57	6.65	-0.0120	0.0001
Nigeria*	6.66	6.79	6.91	6.94	-0.0037	0.0000
Pakistan*	7.44	7.45	7.45	7.62	-0.0229	0.0005
Panama*	8.66	8.64	8.62	8.82	-0.0236	0.0006
Papua New Guinea*	7.73	7.69	7.64	7.77	-0.0166	0.0003
Paraguay*	8.39	8.32	8.26	8.41	-0.0188	0.0004
Peru*	8.37	8.43	8.48	8.56	-0.0090	0.0001

Table 6C. Evaluating forecast performance

Country	Real GDP per capita (in logs) 1995	Real GDP per capita (in logs) 2000	Forecasted Real GDP per capita (in logs) 2004	Actual Real GDP per capita (in logs) 2004	Cumulative Forecast Error Statistic CFE	Theil-U Statistic TU
Philippines*	8.16	8.23	8.30	8.35	-0.0062	0.0000
Poland	9.07	9.22	9.35	9.39	-0.0033	0.0000
Romania	8.56	8.75	8.91	8.95	-0.0043	0.0000
Russian Federation	8.71	8.99	9.23	9.12	0.0127	0.0002
Rwanda	6.88	7.01	7.12	7.11	0.0012	0.0000
Samoa	8.38	8.52	8.64	8.57	0.0085	0.0001
Senegal*	7.19	7.29	7.38	7.39	-0.0012	0.0000
Seychelles	9.64	9.60	9.56	9.62	-0.0070	0.0000
Sierra Leone*	6.04	6.18	6.31	6.63	-0.0475	0.0023
Slovak Republic	9.24	9.37	9.49	9.51	-0.0017	0.0000
Solomon Islands	7.67	7.26	6.89	7.40	-0.0687	0.0047
South Africa*	9.06	9.12	9.17	9.25	-0.0080	0.0001
Sri Lanka*	8.02	8.10	8.17	8.26	-0.0110	0.0001
St. Kitts and Nevis	9.25	9.31	9.37	9.38	-0.0002	0.0000
St. Lucia	8.54	8.49	8.45	8.62	-0.0198	0.0004
St. Vincent and the Grenadines	8.61	8.69	8.77	8.72	0.0060	0.0000
Sudan	7.37	7.48	7.59	7.53	0.0078	0.0001
Swaziland	8.31	8.32	8.33	8.43	-0.0117	0.0001
Syrian Arab Republic*	8.04	8.04	8.05	8.20	-0.0192	0.0004
Tajikistan	6.52	6.88	7.21	7.01	0.0288	0.0008
Tanzania	6.14	6.27	6.40	6.42	-0.0023	0.0000
Thailand*	8.65	8.79	8.93	8.93	-0.0005	0.0000
Togo*	7.25	7.19	7.14	7.37	-0.0314	0.0010
Tonga	8.55	8.71	8.86	8.81	0.0057	0.0000
Trinidad and Tobago*	8.94	9.07	9.18	9.31	-0.0134	0.0002
Tunisia*	8.62	8.73	8.82	8.86	-0.0045	0.0000
Turkey	8.60	8.68	8.75	8.87	-0.0137	0.0002
Turkmenistan	7.90	8.54	9.12	8.78	0.0388	0.0015
Uganda*	7.03	7.15	7.27	7.27	-0.0010	0.0000
Ukraine	8.17	8.47	8.74	8.67	0.0079	0.0001
Uruguay*	9.02	8.88	8.75	9.08	-0.0359	0.0013
Uzbekistan	7.20	7.32	7.43	7.46	-0.0038	0.0000
Vanuatu	7.91	7.84	7.78	7.89	-0.0146	0.0002
Venezuela, RB*	8.55	8.36	8.19	8.62	-0.0495	0.0025
Vietnam	7.47	7.68	7.87	7.83	0.0059	0.0000
Yemen, Rep.	6.58	6.65	6.72	6.71	0.0006	0.0000
Zambia*	6.56	6.64	6.72	6.75	-0.0039	0.0000
Median	**8.05**	**8.16**	**8.22**	**8.26**	**-0.0070**	**0.0001**
Average*	**7.91**	**7.99**	**8.08**	**8.13**	**-0.0084**	**0.0004**

Source: Authors' calculation and forecasts produced with forecasting model (5). The country cases for which forecasting model (5) performs no worse than the average are marked in grey. These are countries for which the absolute value of the CFE is smaller or approximately equal to the absolute value of the average CFE in Table 6.

* Indicates that the country belongs to the panel used to estimate forecasting model (5). **This is a simple average.

Table 7A. Explaining Changes in Growth Between Decades: 90s vs. 80s

Region/Countries	Actual Change	Forecasted Change	Transitional convergence	Cyclical reversion	Structural Reforms	Stabilization Policies	External Conditions
Sub-Saharan Africa							
Botswana*	-4.42	0.65	-1.21	-0.30	1.84	0.24	0.08
Burkina Faso*	1.29	1.97	-0.15	0.58	1.39	0.70	-0.56
Cote d'Ivoire	2.40	0.38	0.52	-1.17	0.72	-0.10	0.42
DRC (Zaire)	-6.55	-1.75	0.41	-0.91	-0.93	-0.40	0.09
Gambia	0.13	3.22	0.03	0.06	2.53	0.17	0.43
Ghana*	3.08	3.77	0.23	1.06	0.71	1.27	0.52
Kenya	-1.45	0.98	-0.10	-0.08	0.47	0.21	0.48
Madagascar	1.01	1.08	0.38	0.53	-0.40	0.38	0.19
Malawi	2.52	2.27	0.18	0.84	2.16	-0.68	-0.22
Níger	1.64	0.70	0.58	0.15	-0.62	0.80	-0.21
Nigeria*	1.76	2.50	0.34	1.44	-0.26	0.39	0.59
Republic of the Congo	-3.31	0.14	-0.32	-0.45	-0.27	0.60	0.58
Senegal*	0.47	0.43	-0.05	-0.86	0.91	0.62	-0.20
Sierra Leone	-5.73	0.52	0.22	-0.76	0.49	-0.45	1.02
South Africa*	0.94	2.36	0.20	0.20	1.43	0.41	0.12
Togo	0.53	1.00	0.37	1.13	0.66	-0.88	-0.28
Uganda*	-1.41	-3.00	-0.73	-4.76	1.12	1.17	0.20
Zambia*	0.08	0.70	0.35	-0.26	1.30	-0.22	-0.47
Zimbabwe	-1.23	0.67	-0.12	-0.60	1.45	0.02	-0.08
Middle East and North Africa							
Algeria*	-0.05	-0.63	0.04	-0.40	-1.17	-0.89	0.75
Egypt*	-0.58	2.12	-0.50	-0.08	1.67	0.49	0.53
Iran, Islamic Rep.*	3.16	1.43	0.12	-2.07	1.27	1.49	0.63
Jordan	2.40	3.86	0.31	2.33	0.99	0.38	-0.15
Morocco*	-1.18	3.92	2.00	0.26	1.75	-0.26	0.17
Syrian Arab Rep.	3.27	2.66	0.20	1.33	1.00	0.50	-0.37
Tunisia*	1.98	2.43	-0.19	0.44	1.84	0.25	0.09
East Asia							
China	1.14	3.37	-1.31	1.14	3.06	0.46	0.02
Indonesia*	-1.67	1.40	-0.76	0.24	2.46	-0.67	0.13
Papua New Guinea	3.44	3.01	0.23	1.91	0.88	-0.36	0.35
Philippines*	0.72	1.87	0.13	-0.39	1.45	0.58	0.10
Thailand*	-2.35	1.41	-1.02	-0.45	3.47	-0.67	0.08
South Asia							
Bangladesh*	0.83	0.73	-0.37	-0.67	1.60	0.23	-0.06
India*	-0.01	-0.32	-0.62	-0.94	1.21	0.28	-0.25
Pakistan	-2.03	1.51	-0.60	0.17	1.56	-0.04	0.42
Sri Lanka	0.79	1.06	-0.53	0.07	0.91	0.08	0.53

Source: Authors' calculations.

Table 7B. Explaining Changes in Growth Between Decades: 90s vs. 80s

Region/Countries	Actual Change	Forecasted Change	Transitional convergence	Cyclical reversion	Structural Reforms	Stabilization Policies	External Conditions
Latin America and Caribbean*							
Argentina	6.71	4.45	0.15	1.7	1.07	1.71	-0.17
Bolivia	3.49	2.54	0.11	-0.02	1.34	1.7	-0.59
Brazil	1.49	1.00	-0.03	0.89	0.88	-0.53	-0.21
Chile	2.91	2.59	-0.66	0.65	1.67	1.33	-0.40
Colombia*	-0.55	2.11	-0.32	0.15	1.15	1.47	-0.34
Costa Rica	3.8	1.13	-0.19	0.36	1.11	0.15	-0.31
Dominican Republic*	3.44	2.42	-0.14	0.46	1.28	0.48	0.34
Ecuador*	0.04	0.73	0.01	0.2	0.83	0.03	-0.35
El Salvador	4.14	2.09	-0.05	-0.1	2.21	0.41	-0.38
Haiti	-0.59	2.34	0.49	0.54	2.24	-0.56	-0.37
Honduras	0.84	0.82	0.04	0.25	0.71	0.16	-0.35
Jamaica*	-1.86	-1.73	-0.3	-0.88	1.45	-1.3	-0.7
Mexico	1.72	1.8	0.05	0.19	1.51	0.24	-0.19
Nicaragua	4.4	1.84	0.67	-0.97	2.56	0.18	-0.6
Peru	5.32	3.84	0.3	0.28	1.29	2.42	-0.46
Paraguay	-0.3	0.73	-0.02	0.47	1.79	-0.86	-0.65
Panama	3.51	1.87	0.04	-0.24	0.83	1.66	-0.43
Trinidad and Tobago	3.28	0.68	0.21	0.01	0.91	0.37	-0.82
Uruguay	3.36	3.03	-0.2	0.76	1.05	1.78	-0.35
Venezuela	1.45	-0.39	0.11	0.2	0.67	-0.94	-0.44

*Results for the countries in Latin America and Caribbean come from Loayza et al. (2004). The cases for which the forecasted changes in growth are less than a percentage point away from the actual changes are marked in grey. An asterisk marks all countries for which forecasting model (5) performed well out of sample (those cases are also shown in Table 6).

Table 8A. Average, annual real per capita GDP growth forecasts and determinants: a decomposition

				Contributions to Forecasted Change in Growth Rate, from 1995-2004 to 2005-14											
				Transitional Convergence	*Cyclical Recovery*	*Structural Policies*					*Stabilization Policies*				*External Condition*
Countries	*Growth rate 1995-2004*	*Forecasted Growth rate 2005-14*	*Forecasted change 2005-14*	Initial GDP per capita	Initial Output Gap	Education	Financial Depth	Trade Openness	Government Burden	Public Infrastru-cture	Inflation	Cyclical Volatility	Real Exchange Rate Overvaluation	Systemic Banking Crises	Terms of Trade shocks
Sub-Saharan Africa															
Botswana	3.46	4.95	1.49	-0.69	0.73	0.65	0.15	-0.24	-0.08	0.87	0.00	0.00	0.01	0.00	0.08
Burkina Faso	2.40	3.54	1.14	-0.37	-0.69	0.87	0.23	0.01	-0.07	0.70	0.00	0.00	0.17	0.00	0.29
Cote d'Ivoire	-0.89	-1.56	-0.67	0.63	-1.91	0.29	-0.17	0.08	0.09	0.55	0.00	0.00	0.02	0.00	-0.26
DRC (Zaire)	-4.79	-6.87	-2.08	0.82	-1.31	-0.61	-0.73	0.19	0.09	-0.52	-0.12	0.00	0.24	0.00	-0.12
Gambia	1.06	2.25	1.19	-0.09	-0.58	0.84	0.08	-0.17	0.39	0.64	0.01	0.00	0.04	0.00	0.03
Ghana	2.33	4.48	2.15	-0.29	-0.22	0.12	0.38	0.03	-0.15	1.96	-0.03	0.00	0.46	0.00	-0.11
Kenya	-0.68	-1.07	-0.39	0.16	-0.47	0.33	0.06	0.03	-0.50	0.26	0.03	0.00	-0.11	0.00	-0.18
Madagascar	-0.68	-0.63	0.05	0.15	-0.01	-0.27	-0.32	0.27	0.09	0.14	-0.02	0.00	0.00	0.00	0.01
Malawi	1.67	0.89	-0.78	0.14	-2.86	1.98	-0.42	-0.17	0.25	0.25	-0.03	0.00	0.18	0.00	-0.10
Niger	0.18	0.58	0.40	-0.03	-0.20	0.28	-0.32	-0.15	0.39	0.22	0.01	0.00	0.17	0.00	0.02
Nigeria	0.77	-0.05	-0.82	-0.41	0.20	0.73	0.09	0.52	-2.17	0.28	-0.05	0.00	-0.05	0.00	0.05
Rep. of the Congo	2.03	-1.77	-3.80	-0.06	-3.80	-0.32	-0.46	-0.09	0.78	0.09	-0.07	0.00	0.20	0.00	-0.06
Senegal	2.08	3.43	1.35	-0.36	-0.21	0.36	-0.01	-0.09	0.41	0.91	0.00	0.00	0.20	0.00	0.15
Sierra Leone	-3.67	-1.45	2.22	-1.09	2.87	0.99	-0.31	-0.64	-0.13	0.09	0.05	0.00	0.10	0.00	0.29
South Africa	0.65	1.32	0.67	-0.18	0.04	-0.24	0.41	0.10	0.09	0.23	0.01	0.00	0.09	0.00	0.12
Togo	-0.35	1.34	1.69	0.21	-0.45	1.12	-0.10	0.19	-0.08	0.62	0.00	0.00	-0.01	0.00	0.18
Uganda	3.26	4.54	1.28	-0.39	-0.54	1.01	0.31	0.60	0.12	0.28	0.07	0.00	0.17	0.00	-0.35
Zambia	0.36	0.89	0.53	-0.32	-0.30	-0.50	0.25	-0.09	1.40	0.11	-0.11	0.00	-0.02	0.00	0.10
Zimbabwe	-2.94	-2.32	0.62	1.13	-1.11	0.27	0.08	0.30	-0.66	0.25	-0.04	0.00	0.15	0.00	0.23
Average*	**1.29**	**2.12**	**0.83**	**-0.24**	**-0.11**	**0.33**	**0.15**	**0.00**	**0.00**	**0.56**	**0.00**	**0.00**	**0.09**	**0.00**	**0.06**
Median	**0.65**	**0.89**	**0.62**	**-0.09**	**-0.45**	**0.33**	**0.06**	**0.03**	**0.09**	**0.26**	**0.00**	**0.00**	**0.10**	**0.00**	**0.03**
East Asia and Pacific															
China	7.48	8.76	1.28	-1.12	0.37	0.33	0.32	0.49	-0.05	0.85	0.04	0.00	0.13	0.00	-0.07
Indonesia	1.91	3.59	1.68	-0.38	0.01	0.60	0.06	-0.08	0.48	0.80	0.02	0.00	0.15	0.00	0.01
Papua New Guinea	-2.39	0.06	2.45	0.34	0.68	0.57	0.06	0.31	0.35	0.22	0.00	0.00	0.15	0.00	-0.23
Philippines	1.39	2.63	1.24	-0.30	0.23	0.12	-0.10	0.11	0.06	1.00	0.00	0.00	0.03	0.00	0.08
Thailand	2.40	4.58	2.18	-0.61	0.71	0.87	0.31	0.32	-0.11	0.68	0.00	0.00	0.05	0.00	-0.05
Average*	**3.12**	**4.84**	**1.73**	**-0.58**	**0.44**	**0.54**	**0.19**	**0.27**	**0.05**	**0.76**	**0.01**	**0.00**	**0.09**	**0.00**	**-0.04**
Median	**1.91**	**3.59**	**1.68**	**-0.38**	**0.37**	**0.57**	**0.06**	**0.31**	**0.06**	**0.80**	**0.00**	**0.00**	**0.13**	**0.00**	**-0.05**
Middle East & North Africa															
Algeria	2.13	0.84	-1.29	-0.38	-1.09	0.61	-0.39	-0.16	-0.28	0.52	0.05	0.00	-0.02	0.00	-0.15
Egypt	2.36	2.67	0.31	-0.31	-0.36	0.26	0.37	-0.07	0.11	0.69	0.02	0.00	-0.10	0.00	-0.30
Iran, Islamic Rep.	2.81	2.51	-0.30	-0.66	0.16	0.28	0.07	-0.47	-0.22	0.83	0.05	0.00	-0.12	0.00	-0.22
Jordan	0.61	1.63	1.02	-0.20	0.09	0.75	0.19	0.00	-0.14	0.62	0.01	0.00	-0.12	0.00	-0.18
Morocco	0.62	2.50	1.88	-0.25	1.06	0.50	0.22	0.06	-0.08	0.19	0.00	0.00	0.15	0.00	0.03
Syrian Arab Rep.	1.00	1.02	0.02	-0.03	-0.18	0.12	-0.22	0.03	-0.09	0.54	-0.02	0.00	-0.28	0.00	0.15
Tunisia	3.28	4.79	1.51	-0.47	-0.10	0.58	0.15	0.03	0.27	0.72	0.01	0.00	0.09	0.00	0.23
Average*	**2.10**	**2.47**	**0.37**	**-0.39**	**-0.11**	**0.46**	**0.04**	**-0.12**	**-0.06**	**0.62**	**0.02**	**0.00**	**-0.05**	**0.00**	**-0.06**
Median	**2.13**	**2.50**	**0.31**	**-0.31**	**-0.10**	**0.50**	**0.15**	**0.00**	**-0.09**	**0.62**	**0.01**	**0.00**	**-0.10**	**0.00**	**-0.15**

Source: Authors' forecasts produced with forecasting model (5) and authors' forecasts of underlying determinants. *The regional averages are computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 8B. Average, annual real per capita GDP growth forecasts and determinants: a decomposition

				Contributions to Forecasted Change in Growth Rate, from 1994-2005 to 2004-15											
				Transitional Convergence	*Cyclical Recovery*	*Structural Policies*					*Stabilization Policies*				*External Conditions*
Countries	*Growth rate 1995-2004*	*Forecasted Growth rate 2005-14*	*Forecasted change 2005-14*	Initial GDP per capita	Initial Output Gap	Education	Financial Depth	Trade Openness	Government Burden	Public Infrastruc-ture	Inflation	Cyclical Volatility	Real Exchange Rate Overvaluation	Systemic Banking Crises	Terms of Trade shocks
Latin America and the Caribbean															
Argentina	-0.06	0.38	0.44	0.36	0.45	0.18	-0.10	0.14	0.20	0.20	-0.03	-0.17	0.38	-0.97	-0.20
Bolivia	0.73	0.76	0.03	-0.06	-0.03	0.19	0.20	-0.09	0.05	0.30	-0.01	-0.06	-0.13	-0.55	0.22
Brazil	1.06	4.52	3.46	-0.11	0.36	0.39	0.09	0.29	-0.08	0.32	0.31	0.23	0.30	1.51	-0.14
Chile	2.87	2.73	-0.14	-0.36	0.32	0.11	0.06	0.20	-0.24	0.40	0.02	-0.24	-0.13	-0.06	-0.22
Columbia	0.21	1.63	1.42	-0.17	0.72	0.01	-0.05	0.12	0.21	0.33	0.05	0.36	-0.05	-0.19	0.08
Costa Rica	3.16	2.20	-0.96	-0.03	-2.15	0.29	0.30	0.31	-0.14	0.24	0.03	0.34	-0.15	0.00	0.00
Dominican Rep.	3.13	0.37	-2.76	-0.26	-0.44	0.27	0.22	-0.01	-1.19	0.36	-0.04	0.09	-0.06	-1.73	0.03
Ecuador	0.75	3.25	2.50	-0.28	0.65	0.61	0.22	-0.01	-0.29	0.45	0.10	0.59	0.30	0.01	0.15
El Salvador	1.07	2.00	0.93	-0.03	-0.02	0.13	0.02	0.55	-0.20	0.44	0.01	0.24	-0.19	0.00	-0.03
Guatemala	0.71	2.37	1.66	0.00	-0.20	1.07	0.13	0.15	-0.13	0.70	-0.03	0.00	-0.03	0.00	0.01
Haiti	-1.84	-0.84	1.00	0.42	-1.36	0.47	0.06	-0.15	-0.26	0.29	-0.02	0.91	0.26	-0.01	0.39
Honduras	0.17	1.43	1.26	-0.14	0.50	0.01	0.19	0.32	-0.29	0.28	0.02	0.48	-0.19	0.00	0.08
Jamaica	-0.25	2.10	2.35	-0.15	0.15	0.24	0.05	0.05	-0.23	0.27	0.05	0.15	-0.16	1.74	0.20
Mexico	1.05	3.84	2.79	-0.12	0.70	0.22	-0.29	0.60	-0.12	0.25	0.05	0.53	-0.04	1.11	-0.10
Nicaragua	-0.98	3.24	4.22	-0.07	1.38	0.25	0.02	0.42	-0.07	0.41	0.46	0.38	-0.02	1.25	-0.19
Panama	2.52	1.78	-0.74	-0.11	-0.98	-0.04	0.29	0.02	-0.14	0.14	0.00	0.12	-0.04	0.00	0.00
Paraguay	-0.99	0.04	1.03	0.27	-0.22	0.12	-0.08	-0.42	-0.17	0.22	-0.01	0.10	0.02	1.24	-0.04
Peru	1.60	2.73	1.13	-0.25	0.50	0.12	0.15	0.05	-0.19	0.10	0.06	0.51	0.08	-0.27	0.26
Trinidad &	5.33	5.18	-0.15	-0.86	-0.25	0.01	0.02	0.23	-0.08	0.22	0.00	0.34	-0.01	0.00	0.23
Uruguay	-0.07	0.04	0.11	0.38	0.30	0.00	0.49	0.28	-0.12	0.20	0.05	-0.20	0.20	-1.35	-0.13
Venezuela, RB	-2.15	-1.14	1.01	0.56	0.41	0.54	-0.28	0.09	-0.17	0.04	0.02	-0.36	-0.02	0.30	-0.12
Average*	**1.51**	**2.22**	**0.71**	**-0.12**	**0.00**	**0.20**	**0.08**	**0.19**	**-0.16**	**0.28**	**0.04**	**0.17**	**0.02**	**0.01**	**-0.01**
Median	**0.73**	**2.00**	**1.01**	**-0.11**	**0.30**	**0.19**	**0.06**	**0.14**	**-0.14**	**0.28**	**0.02**	**0.23**	**-0.03**	**0.00**	**0.00**
South Asia															
Bangladesh	3.10	5.14	2.04	-0.49	-0.06	1.32	0.32	0.19	-0.09	0.45	0.02	0.00	0.01	0.00	0.37
India	4.09	4.90	0.81	-0.59	-0.42	0.30	0.26	0.12	-0.25	1.32	-0.01	0.00	0.03	0.00	0.05
Pakistan	1.73	2.12	0.39	-0.21	-0.07	0.09	0.08	-0.27	0.22	0.30	0.00	0.00	0.10	0.00	0.16
Sri Lanka	3.12	4.00	0.88	-0.37	-0.10	0.23	0.37	0.18	-0.49	1.18	-0.02	0.00	-0.01	0.00	-0.08
Average*	**3.14**	**4.11**	**0.97**	**-0.42**	**-0.18**	**0.41**	**0.28**	**0.08**	**-0.22**	**0.93**	**-0.01**	**0.00**	**0.02**	**0.00**	**0.08**
Median	**3.11**	**4.45**	**0.85**	**-0.43**	**-0.09**	**0.26**	**0.29**	**0.15**	**-0.17**	**0.82**	**-0.01**	**0.00**	**0.02**	**0.00**	**0.11**
Average deve-loping country*	**1.81**	**2.61**	**0.79**	**-0.24**	**0.00**	**0.31**	**0.10**	**0.11**	**-0.10**	**0.46**	**0.03**	**0.09**	**0.03**	**0.01**	**0.00**

Source: Authors' forecasts produced with forecasting model (5) and authors' forecasts of underlying determinants. Forecasts for the countries in Latin America and Caribbean are based on forecasts of the underlying determinants from Loayza *et al*. (2005). *The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 9A. Average, annual real per capita GDP growth forecasts and determinants: a decomposition with pure cross section model

						Contributions to Forecasted Change in Growth Rate, from 1994-2005 to 2004-15						
						Transitional Convergence	*Structural Policies*					*Stabilization Policies*
Countries	*Growth rate 1995-2004*	*Forecasted Growth rate 2005-14*	*Confidence Interval*		*Forecasted change 2005-14*	Initial GDP per capita	Education	Financial Depth	Trade Openness	Government Burden	Public Infrastructure	Inflation
Africa												
Botswana	3.46	4.16	-3.75	12.07	0.70	-0.95	0.31	0.10	-0.12	-0.07	1.43	0.00
Burkina Faso	2.40	3.56	0.32	6.79	1.16	-0.50	0.41	0.16	0.00	-0.07	1.15	0.00
Cote d'Ivoire	-0.89	1.02	-8.88	10.91	1.91	0.86	0.14	-0.12	0.04	0.09	0.90	0.00
DRC (Zaire)	-4.79	-5.29	-14.21	3.64	-0.50	1.12	-0.29	-0.50	0.09	0.08	-0.86	-0.15
Gambia	1.06	2.74	-1.65	7.13	1.68	-0.12	0.40	0.05	-0.09	0.37	1.05	0.02
Ghana	2.33	5.30	-1.73	12.33	2.97	-0.40	0.06	0.26	0.02	-0.14	3.21	-0.03
Kenya	-0.68	-0.26	-4.25	3.73	0.42	0.22	0.16	0.04	0.01	-0.47	0.43	0.03
Madagascar	-0.68	-0.39	-4.04	3.26	0.29	0.21	-0.13	-0.22	0.14	0.08	0.23	-0.02
Malawi	1.67	3.05	-2.72	8.82	1.38	0.20	0.94	-0.29	-0.08	0.24	0.40	-0.04
Niger	0.18	0.73	-9.66	11.12	0.55	-0.04	0.14	-0.22	-0.08	0.37	0.37	0.01
Nigeria	0.77	-0.78	-13.26	11.70	-1.55	-0.56	0.35	0.06	0.26	-2.04	0.45	-0.06
Republic of the Congo	2.03	2.22	-11.89	16.34	0.19	-0.09	-0.15	-0.32	-0.04	0.73	0.15	-0.08
Senegal	2.08	3.58	1.03	6.14	1.50	-0.49	0.17	-0.01	-0.05	0.38	1.49	0.00
Sierra Leone	-3.67	-5.13	-13.81	3.55	-1.46	-1.48	0.47	-0.21	-0.32	-0.12	0.14	0.06
South Africa	0.65	1.09	-2.60	4.78	0.44	-0.25	-0.12	0.28	0.05	0.09	0.37	0.01
Togo	-0.35	1.45	-4.51	7.41	1.80	0.29	0.53	-0.07	0.09	-0.08	1.02	0.01
Uganda	3.26	4.38	-3.64	12.39	1.12	-0.54	0.48	0.21	0.30	0.12	0.46	0.08
Zambia	0.36	1.17	-7.01	9.35	0.81	-0.43	-0.24	0.17	-0.04	1.32	0.17	-0.14
Zimbabwe	-2.94	-1.32	-10.37	7.73	1.62	1.55	0.13	0.05	0.15	-0.62	0.40	-0.05
Average*	**1.29**	**2.13**	**-4.30**	**8.56**	**0.84**	**-0.33**	**0.16**	**0.10**	**0.00**	**0.00**	**0.91**	**0.00**
Median	**0.65**	**1.17**	**-4.25**	**7.73**	**0.81**	**-0.12**	**0.16**	**0.04**	**0.01**	**0.08**	**0.43**	**0.00**
East Asia												
China	7.48	7.96	3.47	12.45	0.48	-1.53	0.16	0.22	0.24	-0.05	1.39	0.05
Indonesia	1.91	3.55	-1.63	8.72	1.64	-0.51	0.36	0.04	-0.04	0.45	1.31	0.03
Papua New Guinea	-2.39	-0.78	-9.43	7.87	1.61	0.46	0.27	0.04	0.16	0.33	0.36	0.00
Philippines	1.39	2.73	0.27	5.18	1.34	-0.41	0.06	-0.07	0.05	0.06	1.64	0.00
Thailand	2.40	3.37	-2.21	8.95	0.97	-0.83	0.42	0.21	0.16	-0.11	1.12	0.00
Average*	**3.12**	**4.16**	**-0.77**	**9.10**	**1.05**	**-0.79**	**0.27**	**0.13**	**0.14**	**0.05**	**1.25**	**0.01**
Median	**1.91**	**3.37**	**-1.63**	**8.72**	**1.34**	**-0.51**	**0.27**	**0.04**	**0.16**	**0.06**	**1.31**	**0.00**
Middle East & North Africa												
Algeria	2.13	2.21	-2.27	6.68	0.08	-0.52	0.29	-0.26	-0.08	-0.27	0.85	0.07
Egypt	2.36	3.53	-2.25	9.31	1.17	-0.43	0.12	0.26	-0.03	0.10	1.12	0.02
Iran, Islamic Rep.	2.81	3.07	-7.91	14.05	0.26	-0.89	0.13	0.05	-0.24	-0.21	1.36	0.06
Jordan	0.61	1.72	-9.45	12.88	1.11	-0.27	0.36	0.13	0.00	-0.13	1.01	0.01
Morocco	0.62	0.94	-4.94	6.82	0.32	-0.33	0.24	0.15	0.03	-0.08	0.31	0.00
Syrian Arab Rep.	1.00	1.66	-5.36	8.69	0.66	-0.04	0.06	-0.15	0.01	-0.08	0.89	-0.02
Tunisia	3.28	4.46	-0.17	9.09	1.18	-0.65	0.28	0.10	0.02	0.25	1.17	0.01
Average*	**2.10**	**2.75**	**-4.41**	**9.92**	**0.65**	**-0.53**	**0.22**	**0.03**	**-0.06**	**-0.06**	**1.02**	**0.03**
Median	**2.13**	**2.21**	**-4.94**	**9.09**	**0.66**	**-0.43**	**0.24**	**0.10**	**0.00**	**-0.08**	**1.01**	**0.01**

Source: Authors' calculations based on pure cross section OLS estimates in Loayza *et al*. (2005) and authors' forecasts of underlying determinants. *****The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Table 9B. Average, annual real per capita GDP growth forecasts and determinants: a decomposition with pure cross section model

						Contributions to Forecasted Change in Growth Rate, from 1994-2005 to 2004-15						
						Transitional Convergence	*Structural Policies*					*Stabilization Policies*
Countries	*Growth rate 1995-2004*	*Forecasted Growth rate 2005-14*	*Confidence Interval*		*Forecasted change 2005-14*	Initial GDP per capita	Education	Financial Depth	Trade Openness	Government Burden	Public Infrastructure	Inflation
Latin America and Caribbean												
Argentina	-0.06	0.99	-4.91	6.89	1.05	0.49	0.09	-0.07	0.07	0.19	0.33	-0.04
Bolivia	0.73	1.35	-1.73	4.43	0.62	-0.08	0.09	0.14	-0.05	0.05	0.49	-0.01
Brazil	1.06	2.13	-2.95	7.21	1.07	-0.16	0.19	0.06	0.15	-0.08	0.52	0.39
Chile	2.87	3.03	0.25	5.80	0.16	-0.49	0.05	0.04	0.10	-0.23	0.65	0.03
Colombia	0.21	0.80	-2.34	3.95	0.59	-0.24	0.00	-0.03	0.06	0.20	0.54	0.06
Costa Rica	3.16	3.91	-1.13	8.95	0.75	-0.05	0.14	0.20	0.16	-0.13	0.39	0.04
Dominican Republic	3.13	2.46	-6.32	11.25	-0.67	-0.36	0.13	0.15	-0.01	-1.12	0.59	-0.05
Ecuador	0.75	1.39	-5.53	8.31	0.64	-0.38	0.29	0.15	-0.01	-0.27	0.74	0.13
El Salvador	1.07	1.93	-3.88	7.74	0.86	-0.03	0.06	0.01	0.28	-0.19	0.72	0.01
Guatemala	0.71	2.37	-0.90	5.64	1.66	0.00	0.51	0.09	0.08	-0.13	1.14	-0.03
Haiti	-1.84	-0.88	-6.14	4.38	0.96	0.57	0.22	0.04	-0.08	-0.24	0.47	-0.03
Honduras	0.17	0.49	-5.83	6.80	0.32	-0.19	0.00	0.13	0.16	-0.27	0.46	0.03
Jamaica	-0.25	0.00	-4.20	4.20	0.25	-0.21	0.11	0.03	0.03	-0.22	0.44	0.06
Mexico	1.05	1.46	-1.67	4.59	0.41	-0.16	0.10	-0.20	0.30	-0.11	0.41	0.06
Nicaragua	-0.98	0.44	-7.45	8.34	1.42	-0.10	0.12	0.01	0.21	-0.07	0.67	0.58
Panama	2.52	2.66	-4.17	9.49	0.14	-0.15	-0.02	0.20	0.01	-0.13	0.23	0.00
Paraguay	-0.99	-0.65	-4.30	3.01	0.34	0.37	0.06	-0.05	-0.21	-0.16	0.36	-0.01
Peru	1.60	1.51	-1.40	4.42	-0.09	-0.34	0.06	0.10	0.03	-0.18	0.16	0.08
Trinidad & Tobago	5.33	4.58	-2.15	11.31	-0.75	-1.17	0.00	0.01	0.12	-0.08	0.36	0.00
Uruguay	-0.07	1.20	-4.03	6.43	1.27	0.52	0.00	0.33	0.14	-0.11	0.33	0.06
Venezuela, RB	-2.15	-1.34	-7.47	4.79	0.81	0.77	0.26	-0.19	0.05	-0.16	0.07	0.03
Average*	**1.51**	**1.95**	**-3.16**	**7.07**	**0.44**	**-0.16**	**0.10**	**0.05**	**0.09**	**-0.15**	**0.46**	**0.05**
Median	**0.73**	**1.39**	**-4.03**	**6.43**	**0.62**	**-0.15**	**0.09**	**0.04**	**0.07**	**-0.13**	**0.46**	**0.03**
South Asia												
Bangladesh	3.10	4.05	1.47	6.63	0.95	-0.67	0.63	0.22	0.09	-0.08	0.74	0.02
India	4.09	5.58	2.26	8.90	1.49	-0.80	0.14	0.18	0.06	-0.23	2.16	-0.01
Pakistan	1.73	2.10	-1.33	5.53	0.37	-0.28	0.04	0.05	-0.13	0.21	0.48	0.00
Sri Lanka	3.12	4.50	1.00	8.01	1.38	-0.51	0.11	0.25	0.09	-0.47	1.93	-0.03
Average*	**3.14**	**4.30**	**1.02**	**7.57**	**1.16**	**-0.58**	**0.20**	**0.19**	**0.04**	**-0.21**	**1.53**	**-0.01**
Median	**3.11**	**4.28**	**1.24**	**7.32**	**1.17**	**-0.59**	**0.13**	**0.20**	**0.07**	**-0.16**	**1.33**	**-0.01**
Average developing country*	**1.81**	**2.45**	**-3.10**	**8.01**	**0.64**	**-0.33**	**0.15**	**0.07**	**0.06**	**-0.09**	**0.76**	**0.03**

Source: Authors' calculations based on pure cross section OLS estimates in Loayza et al. (2005) and authors' forecasts of underlying determinants. *The regional average is computed using weights which represent the share of per capita income in the average regional per capita income computed as a simple average and based on data for 2004.

Appendix

Appendix Table 1. Economic growth regressions: various estimation methods

Estimation period		1966-99			
Time Horizon:		5-year periods			
Type of Model:		Pooled	Within	Levels - IV	System - IV
Estimation Technique:		OLS	OLS	GMM	GMM
Instruments:		-	-	Lagged Levels	Lagged Levels/Difference
		[1]	[2]	[3]	[4]
Transitional Convergence:					
Initial GDP per Capita		-0.0139	-0.0516	-0.0169	-0.0176
(in logs)		-3.49	-7.51	-5.37	-3.80
Cyclical Reversion:					
Initial Output Gap		-0.2834	-0.1614	-0.2528	-0.2371
(log[actual GDP/potentialGDP])		-6.13	-4.33	-7.9	-8.52
Structural Policies and Institutions:					
Education		0.0085	0.0036	0.0043	0.0172
(secondary enrollment, in logs)		2.52	0.63	1.42	6.7
Financial Depth		0.0031	0.005	0.0025	0.0066
(private domestic credit/GDP, in logs)		1.57	1.69	1.91	4.28
Trade Openness		0.0083	0.0215	0.0115	0.0096
(structure-adjusted trade volume/GDP, in logs)		2.67	4.16	3.45	3.14
Government Burden		-0.0125	-0.021	-0.0077	-0.0154
(government consumption/GDP, in logs)		-3.16	-3.37	-2.33	-3.18
Public Infrastructure		0.0073	0.0067	0.0151	0.0071
(Main telephone lines per capita, in logs)		3.08	1.6	5.65	2.71
Governance		0.0012	0.0017	-0.0052	-0.0012
(1st principal component of ICRG indicators)		1.02	0.93	-3.27	-0.68
Stabilization Policies:					
Lack of Price Stability		-0.0085	-0.0083	-0.0097	-0.0048
(inflation rate, in log [100+inf rate])		-2.61	-2.64	-2.88	-1.89
Cyclical Volatility:		-0.3069	-0.1904	-0.529	-0.2771
(Std. Dev. of output gap)		-3.58	-2.46	-4.55	-3.76
Real Exchange Rate Overvaluation		-0.008	-0.007	-0.0076	-0.0061
(in logs; index is proportional, overvaluation if >100)		-2.71	-2.01	-2.82	-3.9
Systemic Banking Crises		-0.0171	-0.0201	-0.0142	-0.0289
(frequency of years under crises: 0-1)		-3.96	-4.95	-2.73	-7.42
External Conditions:					
Terms of Trade Shocks		0.0619	0.0498	0.0533	0.072
(growth rate of TOT)		2.34	2.27	4.26	4.98
Period Shifts					
(benchmark for cols. 1 and 3: 1971-75;	71-75:				-0.0090**
benchmark for cols. 4: 1966-70;	76-80:	0.0017	0.0010	-0.0008	-0.0092**
benchmark for cols. 2: average 1971-99;	81-85:	-0.0147**	0.0072*	-0.0188**	-0.0238**
	86-90:	-0.0110**	-0.0031	-0.0160**	-0.0194**
	91-95:	-0.0158**	0.0038	-0.0226**	-0.0258**
	96-99:	-0.0168**	0.0002	-0.0222**	-0.027**
Intercept		0.1418	0.0007	4:12	0.1216
		4.12	0.15	4.91	2.79
No. of Countries/No. of Observations		78/350	78/350	78/350	78/350
SPECIFICATION TESTS (P-Values)					
(a) Sargan Test:				0.374	0.996
(b) Serial Correlation					
First Order		0.000	0.000	0.000	0.000
Second Order		0.021	0.617	0.002	0.461

Notes : For period shifts : ** means significant at 5% and * means significant at 10%; Source: Loayza *et al*. (2005).

Appendix Table 2. Economic growth regressions: various time horizons

Regression Period:	1966-99 Pure Cross Section	Confidence Interval		1966 – 99 Dynamic Panel	Confidence Interval
Time Horizon:	30-year period	(±σ)*		5-year periods	(±σ)
Type of Model:	OLS			System - IV	
Estimation Technique:				GMM	
Instruments:	-			Lagged Levels/Difference	
Dependent Variable: Growth Rate of GDP (t-statistics are presented below the corresponding	[1]	[2]		[3]	[4]
Transitional Convergence:					
Initial GDP per Capita (in logs)	-0.024	(-0.0278, -0.0202)		-0.0176	(-0.0222, -0.0130)
	-6.34			-3.8	
Cyclical Reversion:					
Initial Output Gap (log[actual GDP/potential GDP])				-0.2371	(-0.2649,-0.2093)
				-8.52	
Structural Policies and Institutions:					
Education	0.0082	(0.0044, 0.0120)		0.0172	(0.0146, 0.0198)
(secondary enrollment, in logs)	2.14			6.7	
Financial Depth	0.0045	(0.0016, 0.0074)		0.0066	(0.0051, 0.0081)
(private domestic credit/GDP, in logs)	1.56			4.28	
Trade Openness	0.0048	(0.0009, 0.0088)		0.0096	(0.0065, 0.0127)
(structure-adjusted trade volume/GDP, in logs)	1.24			3.14	
Government Burden	-0.0145	(-0.0196, -0.0094)		-0.0154	(-0.0202, -0.0106)
(government consumption/GDP, in logs)	-2.82			-3.18	
Public Infrastructure	0.0116	(0.0090, 0.0142)		0.0071	(0.0045, 0.0097)
(Main telephone lines per capita, in logs)	4.46			2.71	
Governance	0.0018	(0.0002, 0.0034)		-0.0012	(-0.0030, 0.0006)
(1st principal component of ICRG indicators)	1.15			-0.68	
Stabilization Policies:					
Lack of Price Stability	-0.006	(-0.0088, -0.0032)		-0.0048	(-0.0073, -0.0023)
(inflation rate, in log [100+inf rate])	-2.11			-1.89	
Cyclical Volatility:				-0.2771	(-0.3508, -0.2034)
(Std. Dev. of output gap)				-3.76	
Real Exchange Rate Overvaluation				-0.0061	(-0.0077, -0.0045)
(in logs; index is proportional, overvaluation if >100)				-3.9	
Systemic Banking Crises				-0.0289	(-0.0328, -0.0250)
(frequency of years under crises: 0-1)				-7.42	
External Conditions:					
Terms of Trade Shocks				0.072	(0.0575, 0.0865)
(growth rate of TOT)				4.98	
Period Shifts			71-75:	-0.0090 **	
(benchmark for col. 2: 1960s)			76-80:	-0.0092 **	
(benchmark for col. 3: 1966-70)			81-85:	-0.0238 **	
			86-90:	-0.0194 **	
			91-95:	-0.0258 **	
			96-99:	-0.0270 **	
Intercept	0.2150	(0.1797, 0.2503)		0.1216	(0.0780, 0.1652)
	6.09			2.79	
No. of Countries/No. of Observations	70/70			78/350	
SPECIFICATION TESTS (P-Values)					
(a) Sargan Test:				0.996	
(b) Serial Correlation					
First Order					
Second Order				0.461	

Source: Loayza *et al*. (2005).
*σ denotes standard deviation.