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Economic Growth in Bangladesh: Experience and Policy Priorities

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Abstract

The Liberation War of 1971 destroyed about a fifth of Bangladesh's economy, and the post-war dislocations left the country on a slow growth trajectory for better part of two decades. Then the economy accelerated from 1990, driven by a turnaround in the growth of multi-factor productivity. We identify factors that inhibit another growth spurt: low levels of human capital; poor infrastructure; market failures specific to individual industries; low levels of international trade; corruption; and cumbersome regulations. Of these, we consider tackling infrastructure bottlenecks, promoting trade, and carrying out regulatory reforms as top priorities for the policymakers.

Introduction

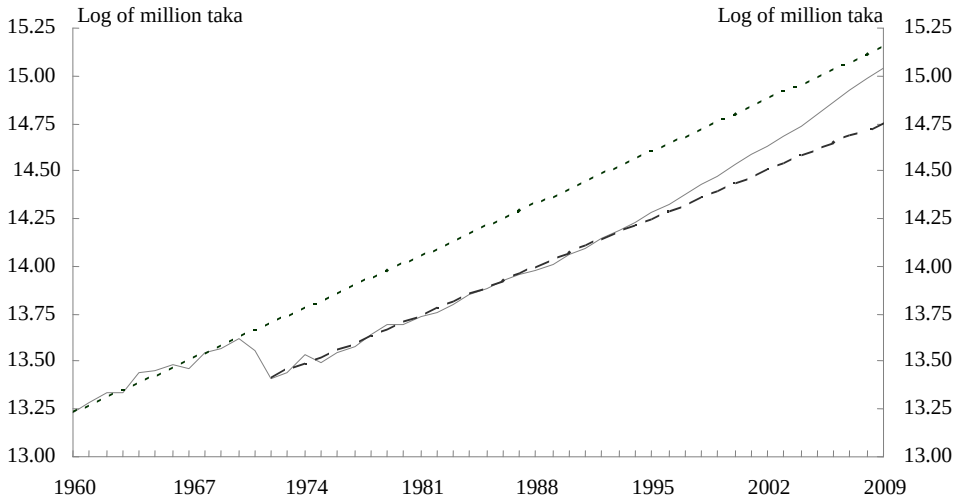
In the 1960s, the then East Pakistan's economy grew by an annual average rate of around 4 per cent. About a fifth of that economy was destroyed during the Liberation War of 1971, and severe dislocations caused at that time left Bangladesh on a slower economic growth trajectory for the following two decades. Then the economy accelerated sharply from 1990. Figure 1 illustrates Bangladesh's economic trajectory over the past five decades.

Had it continued to grow at the 1960s pace in the decades since, Bangladesh's GDP would have been 10 per cent higher by 2009. On the other hand, if not for the post-1990 acceleration, the Bangladesh economy would have been 29 per cent lower in 2009 than the actual. In 2009, GDP per capita was about 21,000 taka (in 1995 prices). Had the 1980s growth rate persisted, the average Bangladeshi would have been about 7,100 taka worse off (or a third poorer) in 2009.

The implications of an even a small but sustained increase in economic growth is self-evident. Therefore, it is natural to ask whether another sustained economic acceleration is possible. To paraphrase Lucas (1988):

Is there some action the government could take that would lead the Bangladesh economy to increase its growth rate by another 2 percentage points? If so, what exactly? If not what is it about the "nature of current Bangladesh" that makes it so. The consequences for human welfare involved in questions like these are simply staggering. Once one

Figure 1: Real GDP



The solid line shows actual path of GDP. The dotted line is the hypothetical path based on the 1960s trend and the dashed one is on the 1970s/1980s trend.
Source: Bangladesh Bureau of Statistics, World Bank, authors' calculations.

starts to think about them, it is hard to think about anything else.

We analyse Bangladesh's growth experience and explore policy priorities that could spur another sustained pick up in growth rate. The paper is structured as follows.

In the next section, we focus on Bangladesh's growth experience of the past five decades. Consistent with the existing literature, we find that the post-1980s economic acceleration had been due to a turnaround in multi factor productivity (MFP) growth. A combination of macroeconomic stability, education and openness may explain the MFP turnaround.

Next, we benchmark Bangladesh's performance with a set of comparable countries. Bangladesh lags behind the reference countries in terms of investment in physical and human capital, and trade. We also discuss policy priorities— increased openness, more investment in human capital, reform of economic and political governance —identified in earlier surveys on the country's economy in this section.

It is, however, far from clear that large scale reforms of economic or political institutions are either necessary or sufficient preconditions for an economic acceleration. Finally, we ask what are the key constraints prohibiting Bangladesh from growing by a sustained pace of, say, 7¼ per cent a year? We use the *growth diagnostics* framework of Rodrik, Hausmann, and Valesco (2005) to explore this question. As far as we are aware, this is the first growth diagnostics assessment of the Bangladesh economy.

We find that major constraints on Bangladesh's economic growth include: low levels of human capital; poor infrastructure; market failures in specific sectors; low levels of trade; corruption; and cumbersome regulation. Of these, designing appropriate policy responses to raise human capital, curb corruption, or alleviate sector specific market failures will require much further research. Unless carefully crafted, policy actions on these issues could at best be ineffective, and at worst, downright counterproductive in their impacts on economic growth. In comparison, tackling infrastructure bottlenecks, promote trade, and reducing the regulatory burden on the private sector are relatively straightforward, albeit not necessarily easy, tasks that should be tackled as priority.

In this paper, we do not discuss whether economic growth has translated into higher standards of living for the poorest sections of the society. Nor do we ask whether inequality has widened during the growth process, or how the environment has been affected. We implicitly assume that a sustained further increase in economic growth will accompany a pro-poor, equitable, welfare enhancing income and wealth distribution. These are strong assumptions. However, these are also important issues that we feel cannot be addressed adequately in passing. 'The quality of Bangladesh's economic growth — past, present, and future' is a subject of research in its own right.

Growth Experience

We begin this Section with a set of figures to illustrate Bangladesh's growth experience over the past five decades. Then we perform a set of growth accounting exercises, and discuss some explanations for the post-1990 growth pick up.

Economic growth in Bangladesh since 1960

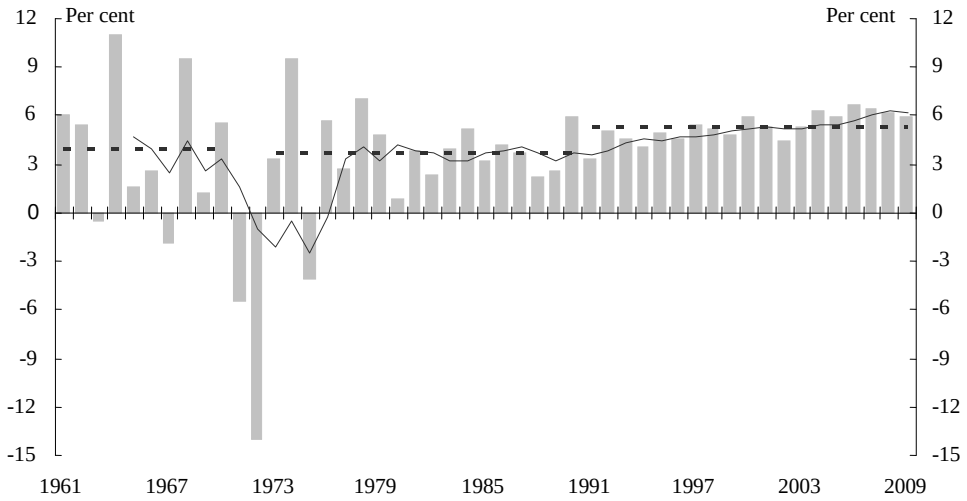
After suffering major set backs in *levels* during the Liberation War and a slowdown in *growth* in its aftermath, Bangladesh's economy has accelerated since the end of the 1980s (Figure 2).[1] Economic growth has also become less volatile over time.[2]

The sectoral composition of the economy has changed significantly over the past five decades. Agriculture's share of the economy has nearly halved from about two-fifths in the early 1960s. The share of industry, on the other hand, has doubled since the early 1970s to about 30 per cent. Services have steadily accounted for about half of the economy since the 1970s. The economic acceleration of the past couple of decades has occurred nearly evenly in the industry and services sectors. Services contributed particularly strongly to growth in the 2000s.

Investment, exports and imports have risen relative to nominal GDP in recent decades (Figure 3), with positive impacts on economic growth.[3]

After being set back sharply during the Liberation War, investment's share of GDP rose in the late 1970s, before stagnating during the 1980s. Since the end of the 1980s, investment has risen steadily relative to GDP, albeit the pace of the rise has eased in the current decade. Higher investment-to-GDP ratio means more capital in the economy. According

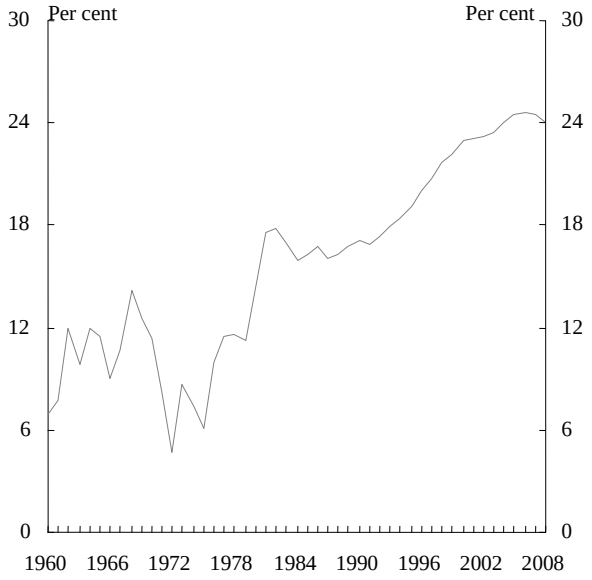
Figure 2: Growth in real GDP



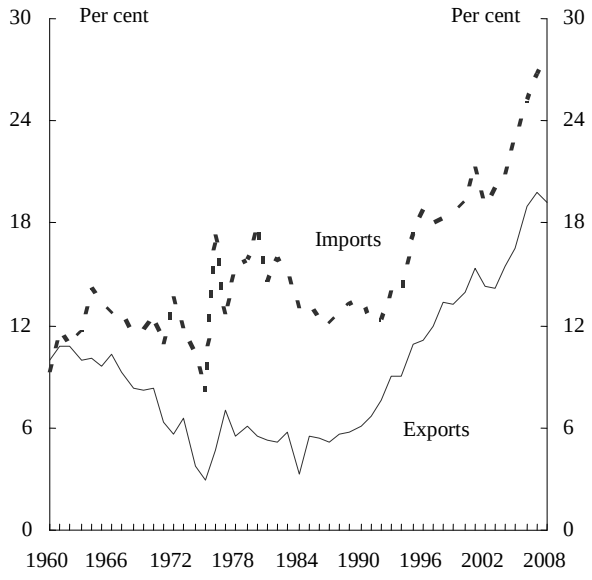
The columns represent annual growth; the dotted lines represent annual average growth over the 1960s, 1972-90, and since 1990; the thin line represents annualised growth over the previous five years.
Source: BBS, World Bank, authors' calculations.

Figure 3: Share of nominal GDP

Investment



Exports and imports



Source: BBS, World Bank, authors' calculations.

to the neoclassical growth model, capital accumulation should lead to a higher *level* of income in the steady state, whereas in some endogenous models of economic growth, capital accumulation can lead to a faster steady state *growth rate*. In either case, steadily rising investment-to-GDP ratio since the end of the 1980s, all else being equal, would have been expected to raise Bangladesh's economic growth in the medium term.

Exports fell continuously in the pre-war period relative to GDP, and exports-to-GDP ratio stagnated at very low levels up to the late 1980s. Since then, however, exports' share of GDP has risen steadily. Imports have also risen steadily relative to GDP since the 1980s. Rises in exports and imports relative to GDP in the post-1980s period should also have increased economic growth. Exporting industries need to compete in the global market, while imports

expose the domestic economy to competition from abroad. Increased competition, all else equal, should improve efficiency at the microeconomic level, which should translate into faster productivity growth at the macroeconomic level.

That is, the changing patterns of the expenditures in the economy point to the faster growth that we have observed in the post-1980s period. But the underlying stories for the economic acceleration are different. The question is: which has been more important for Bangladesh — investment-driven factor accumulation, or trade-driven productivity growth? To use words of Krugman (1994), has Bangladesh grown through *perspiration* or *inspiration*? We explore this question next.

Decomposing economic growth

Denoting GDP by *Y*, population by *N*, and working age (those aged between 15 and 64) population as *L*, we can write GDP as follows.

$$Y = \frac{Y}{L} \times \frac{L}{N} \times N \qquad (1)$$

Denoting lower cases as logs, taking log differences of (1) decomposes economic growth into: growth in GDP per working age person; demographic changes; and population growth.

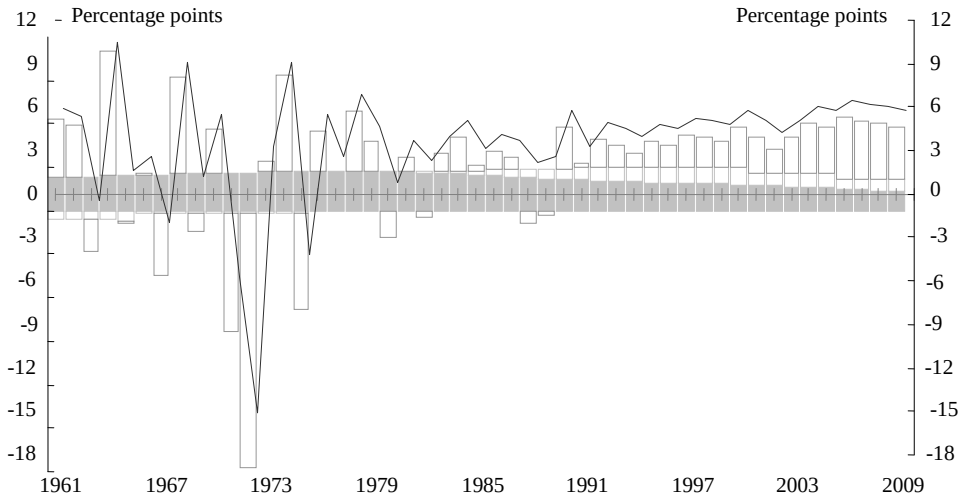
$$\Delta y = \Delta(y - l) + \Delta(l - n) + \Delta n \qquad (1a)$$

Increases in any of the three components in the right-hand-side of (1a) increases GDP growth. Figure 4 shows the relative importance of each of these components over the past five decades.

Population growth has steadily slowed from around 2.7 per cent a year in the 1970s to 1.4 per cent by 2009. Changes in working age to total population ratio used make a small detraction from GDP growth in the 1960s, when the onset of the population explosion saw the number of young people (aged less than 15 years) outpacing the working age population. The reverse has been the case since the 1980s — while population growth has slowed, working age population has continued to reflect faster growth from earlier decades. As a result, changes in the ratio of working age to total population have been contributing to economic growth since the 1980s.[4]

Figure 4 also shows that population growth and demographic change have accounted for only a small part of the variation in GDP growth in Bangladesh over the past five decades. Bangladesh's economic growth over that period has been driven by growth in GDP per working age person. To the extent that the working age population represents the potential

Figure 4: Decomposing GDP growth



The line represents GDP growth; the grey area represents population growth; the white area represents the contribution from the change in the ratio of working age to total population; the dotted area represents growth in GDP per working age person.
Source: BBS, World Bank, UN, authors' calculations.

number of workers in the economy, we can view GDP per working age person as a broad measure of labour productivity. Figure 4 thus shows that the post-1990 growth pick up is almost entirely driven by changes in labour productivity.

Over time, labour productivity grows because of two reasons: capital deepening and growth in multi-factor productivity (MFP). If workers are given better machines and equipment — that is, if there is capital deepening — this boosts labour productivity. In addition, labour productivity also grows over time if there is an improvement in the efficiency with which capital and labour inputs are used in the production process — this is MFP growth (also referred to as *total* factor productivity, or TFP, growth). Which of these two reasons have been dominant in Bangladesh?

We explore this question by estimating a production function. Assume that in the long run, GDP is represented by a Cobb-Douglas production function, with constant returns to scale and steady, exponential technological change over time.

$$Y_t = AK_t^{\alpha} L_t^{1-\alpha} e^{\delta t} \qquad (2)$$

As before, Y is GDP and L is labour input (working age population). Further, K is capital input, α is the importance of capital in the production process and δ is the exogenous rate of technological change.[5] We can rearrange (2) to express labour productivity ($P = Y/L$) in terms of the capital-labour ratio ($\Gamma = K/L$) and the technology available at a point in time.

$$P_t = A\Gamma_t^{\alpha} e^{\delta t} \qquad (3)$$

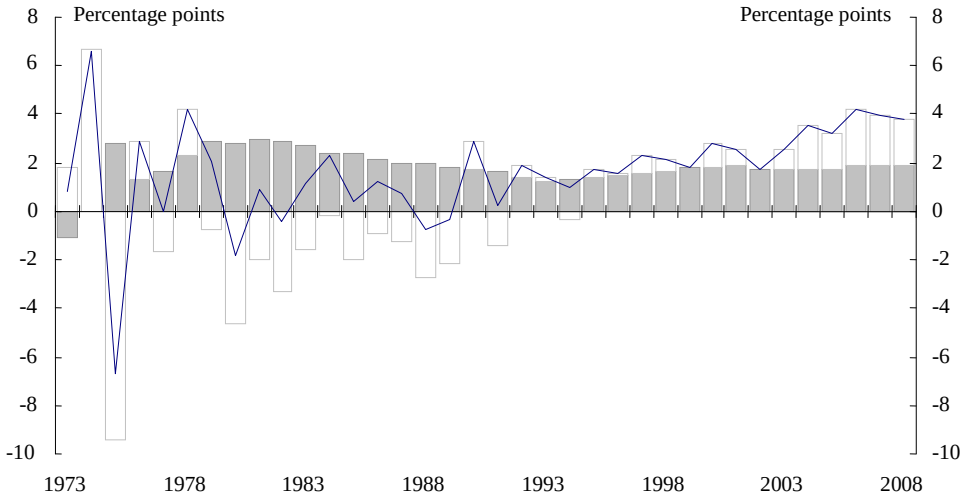
Taking logs of (3) yields a linear relationship between the log levels of output, labour, capital and technology, where p is the log of labour productivity, and k is the log of the capital-labour ratio.

$$p_t = a + \alpha k_t + \delta t \qquad (3a)$$

We estimate (3a) using annual data between 1960 and 2008.[6] Our measure of labour productivity is GDP per working age person. We derive a capital stock series following a standard perpetual inventory method.[7] Capital-labour ratio is therefore the ratio of this capital stock series and the working age population. The trend rate of technological progress is represented by a simple time trend from 1960. We also use a dummy variable for 1971 and 1972 to reflect the effects of the Liberation War. Our estimate of α is 0.31 — suggesting that under our assumptions, capital's share of national income is slightly less than a third.[8]

We interpret the residual between the observed labour productivity growth and the implied contribution of capital deepening given the estimated α as growth in MFP. Figure 5 illustrates this decomposition for the post-War period. Capital deepening contributed about 2¾ percentage points a year to labour productivity growth in the mid-1970s, waning to about 1¼ percentage points a year in the late 1980s,

Figure 5: Decomposing growth in GDP per working age person



The line represents labour productivity growth; the grey area represents contribution of capital deepening; the white area represents multi-factor productivity growth.
Source: BBS, UN, World Bank, authors' calculations.

Table 1: Sources of economic growth

	GDP growth	Population growth	Demographic change	Contribution of capital deepening	Multi factor productivity growth
1960-70	*3.9*	*2.5*	*-0.4*	*1.8*	*0.0*
1972-90	*3.6*	*2.6*	*0.2*	*2.0*	*-1.1*
Since 1990	*5.1*	*1.8*	*1.0*	*1.7*	*0.7*

Source: BBS, UN; World Bank, authors' calculations.

before rising to about 1¾ percentage points in more recent years. Much more interesting has been the trend in MFP, which actually fell regularly up until the late 1980s. That is, if the data are to be believed, in the 1970s and the 1980s, the efficiency with which capital and labour were employed in the economy actually diminished over time. Then, throughout the 1990s, MFP stayed broadly steady. It has been only in the past decade that MFP has been making consistently positive contribution to labour productivity growth.

That is, a turnaround in MFP growth — efficiency with which capital and labour are used in the production process — was instrumental for the post-1980s economic acceleration. A summary decomposition of annual GDP growth during three periods — pre-liberation; post-liberation period of slow growth (1972-1990); and the recent higher growth era (since 1990) — shows the relative importance of the turnaround in MFP growth (Table 1).

The finding that it was MFP, and not factor accumulation, that was the key to the post-1980s economic surge accords well with the empirical literature, which finds that MFP accounts for most of the income differences over time and across countries (Easterly and Levine, 2001). But this just puts the question to the next level: what explains the MFP turnaround?

There is one simple answer to this question. As Moses Abramovitz noted in his seminal 1956 work decomposing growth experience of the United States economy, MFP or TFP is ultimately a measure of our ignorance. And in case of Bangladesh, this could well be the reason for the apparent MFP trends.

As explained in Appendix A, our measures of GDP and capital stock are calculated from indices estimated by the World Bank. The Bank itself estimated those indices from a range of unofficial or semi-official sources, using various rules of thumbs and statistical techniques, for the period prior to 1990. This is because the Bangladesh Bureau of Statistics official estimates of GDP and its components begin from 1990. Therefore, the observed MFP trend may simply reflect poor quality of data prior to 1990.

While data quality may well make a difference to the exact point estimates of MFP growth path, we do not think it makes a qualitative difference to the MFP turnaround story. This is because our finding is qualitatively consistent with two comprehensive surveys on Bangladesh's growth experience.

Mahajan (2005) uses a Cobb-Douglas production function. Unlike us, he 'quality adjusts' his labour input by using average years of schooling. He assumes that capital's share in national income is 0.4, and calculates an implied MFP series for the period 1981-2000. According to his calculations, capital deepening contributed steadily and increasingly to growth process — this finding is very similar to ours. Unlike us, however, he finds strong MFP growth in the early 1980. Nonetheless, he also finds steady MFP growth in the late 1990s — this is qualitatively consistent with our estimate.

Mujeri and Sen (2003) calculate a number of decompositions for the period 1981-90.[9] In all of their models, there is a clear turnaround in MFP growth — ranging from 0.9 to 1.3 percentage points — during the 1990s. In six of their seven models, calculated annual MFP growth is close to zero or negative in the 1980s.

Considering various estimates, we echo Mahajan (2005): *(H)igher TFP growth appears to cause faster capital accumulation, and faster accumulation appears to result in productivity gains.*

If the post-1980s MFP surge is real, then what explains it?

In addition to the growth accounting exercises, Mujeri and Sen (2003) identify four distinct periods in Bangladesh's economic history during the first three post-war decades: post-war reconstruction and recovery (1971-82);[10] slow growth and macroeconomic instability (1983-89); crisis-driven reforms (1990-93); and stronger economic growth and social development (1994-2000).

The authors put NGO-driven service delivery and investment in human capital as one pillar of the post-1990 growth pick up. Macroeconomic stability following the crisis-driven reforms of 1990-93, and successive governments' commitment to the continued liberalisation of the economy is the other reason suggested by Mujeri and Sen for the MFP turnaround.

Recall that trade has risen relative to GDP in the past couple of decades. Exporters need to compete in the global market, while imports expose domestic firms to international competition. Further, if international trade is linked with foreign investment, then transfer of technology from more advanced economies is another linkage through which MFP can grow. Therefore, all else equal, rising international trade should increase the efficiency with which factors of production is used in the economy.

In Bangladesh's case, rising trade in recent decades is linked with the ready-made garments industry. The inception of that industry is a classic case of technology transfer, utilisation of factors according to comparative advantage, and export-led industrialisation. And it stands to reason that increased openness has been a major factor in the post-1990 MFP turnaround.

Factors Affecting Growth Prospects

In this Section, we benchmark Bangladesh's performance in the past decade against a panel of comparable countries, and then discuss policy priorities identified by previous survey articles on Bangladesh's growth experience and implied by a cross country study of economic acceleration.

How does Bangladesh compare?

We begin exploring Bangladesh's growth potential by comparing it against similar countries. Our choice of the panel is guided by two factors: similar population size as Bangladesh — a population of between around 60 and 260 million people in 2008 (Bangladesh's population is estimated to have been about 160 million); and similar stage of economic development — interpreted as purchasing power parity adjusted per capita incomes of between US$1,000 and US$10,000 as measured by the IMF, and not be a member of the OECD. The following countries fulfil both criteria: Egypt, Indonesia, Nigeria, Pakistan, Philippines, Thailand, and Vietnam. These countries make up the benchmark panel.[11]

Between 1990 and 2006, Bangladesh's economy grew by over 120 per cent, more than any of the countries in the panel save Vietnam (which recorded growth of over 220 per cent). However, it had been only in the past decade that Bangladesh has grown at a consistently strong pace relative to the panel (Figure 6).

Annualised GDP growth over the previous five years. The grey area represents the range in the panel. The thick line represents Bangladesh. Data begin in 1990 for Vietnam.
Source: World Bank, Authors' calculation.

We benchmark Bangladesh against the panel on three metrics — investment, education, and trade — that represent three standard proximate sources of economic growth: physical capital accumulation; human capital accumulation; and MFP growth driven by competition and technology transfer from advanced economies.

To the extent that investment reflects profit maximising opportunities by private firms or government provision of public goods, higher investment should lead to stronger contribution of capital deepening and faster economic growth. Bangladesh had a low investment-to-GDP ratio compared with the panel up until the mid-1990s (Figure 7). Even at the end of the sample period, Vietnam and Thailand were investing more than Bangladesh relative to GDP.

Human capital is an important source of growth in most endogenous models of economic growth. Education is an oft-used proxy for human capital.[12] In 2000, average years of schooling in Bangladesh were lower than any other country in the panel (Figure 8a) — particularly, at 1.88 years, the average Bangladeshi woman had much less schooling than her sisters in the panel.[13] More worryingly, Bangladesh has not been investing as much on education as most other countries in the panel during the current decade (Figure 8b).[14]

Figure 6: GDP growth — Bangladesh vs the panel

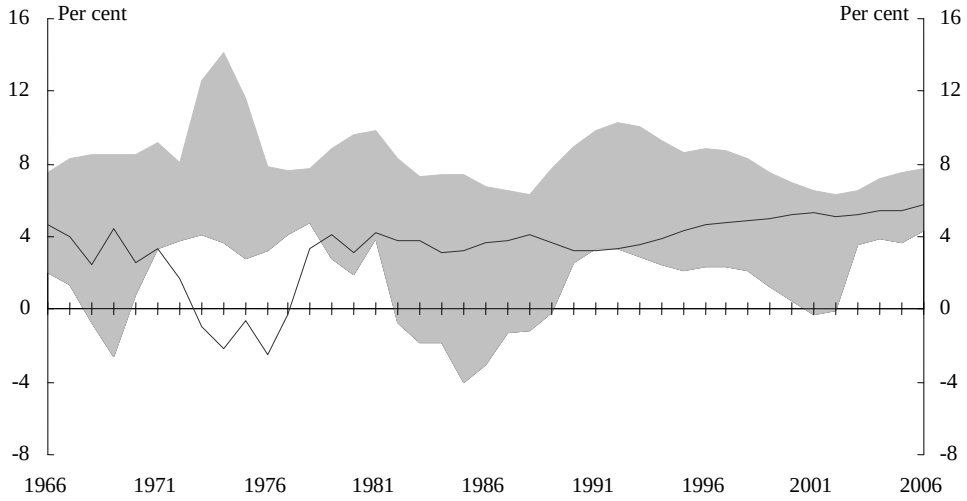
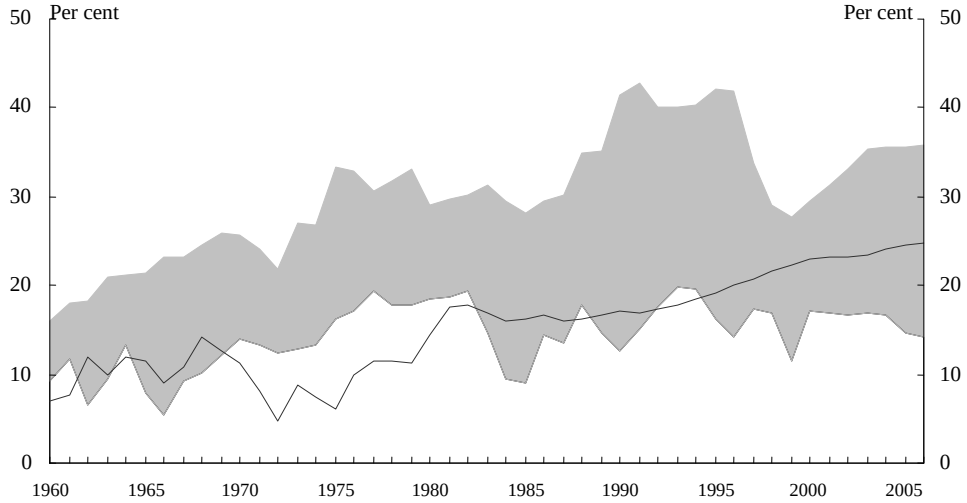


Figure 7: Nominal investment-to-GDP ratio — Bangladesh vs the panel



The grey area represents the panel's range. The thick line represents Bangladesh. Vietnam data began in 1986.
Source: World Bank, Authors' calculation.

There is a broad consensus that many East Asian economies achieved rapid economic growth since the 1950s by relying on exports-driven industrialisation. As discussed above, increasing trade is likely to have spurred the post-1990 MFP turnaround in Bangladesh. Nonetheless, Bangladesh was still a relatively closed economy during the first half of the current decade (Figure 9), with only Pakistan trading less between 2001 and 2006.

Policies that could spur another growth take off

The above discussion suggests that Bangladesh should invest more, particularly on education, and there may be a lot of gains to be had by increasing trade. However, our cursory approach does not tell us exactly how much could be gained by the marginal policy effort on either (or other unexplored) front.

To answer that question, a much more systematic analysis is required. Mahajan (2005) is one example of such an analysis. The author starts with estimating a standard specification of cross-country growth regression based on the neoclassical framework of Mankiw, Romer and Weil (1992). His data coverage is from 1981 to 2000. He adds to the basic equation a number of additional variables to proxy policy reforms in: financial sector; foreign direct investment

Figure 8a: Human capital — Bangladesh vs the panel
12a: Average years of schooling (2000)

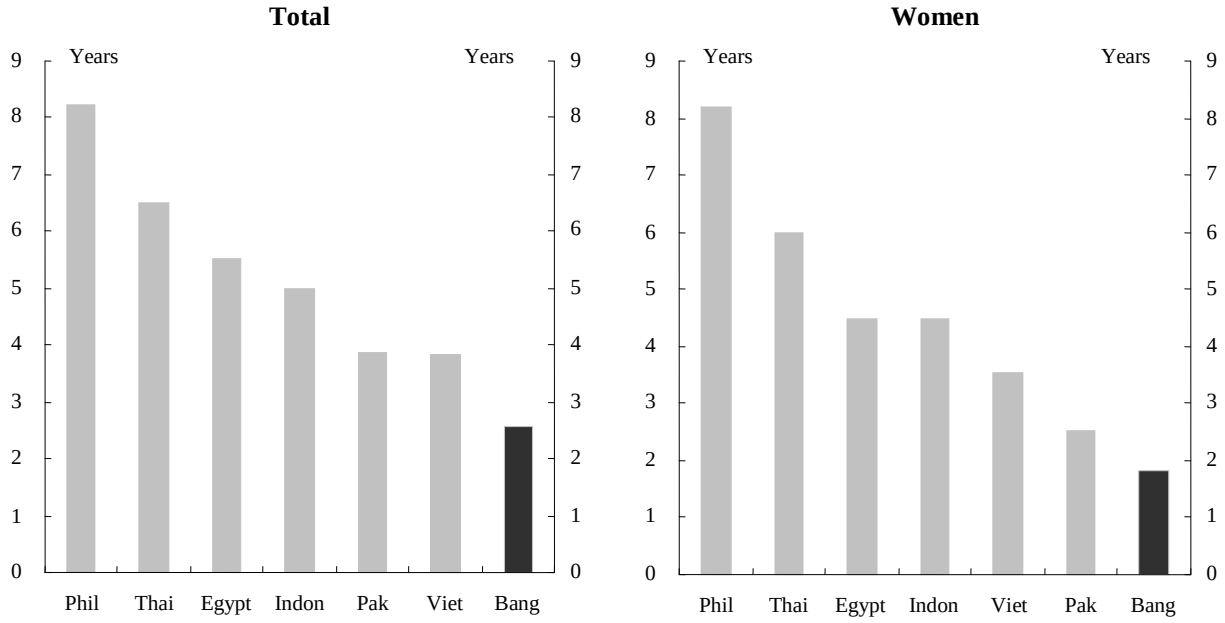
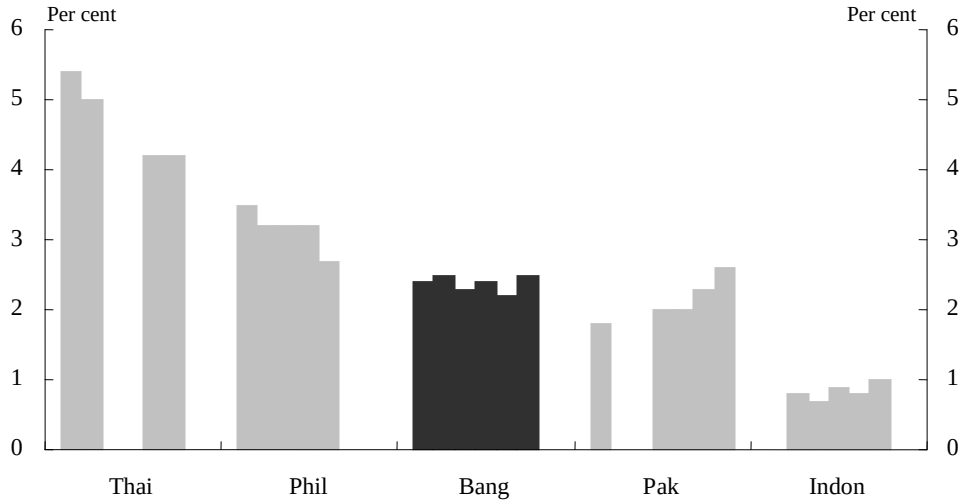


Figure 8b: Public expenditure on education (percentage of GDP, 2001-06)



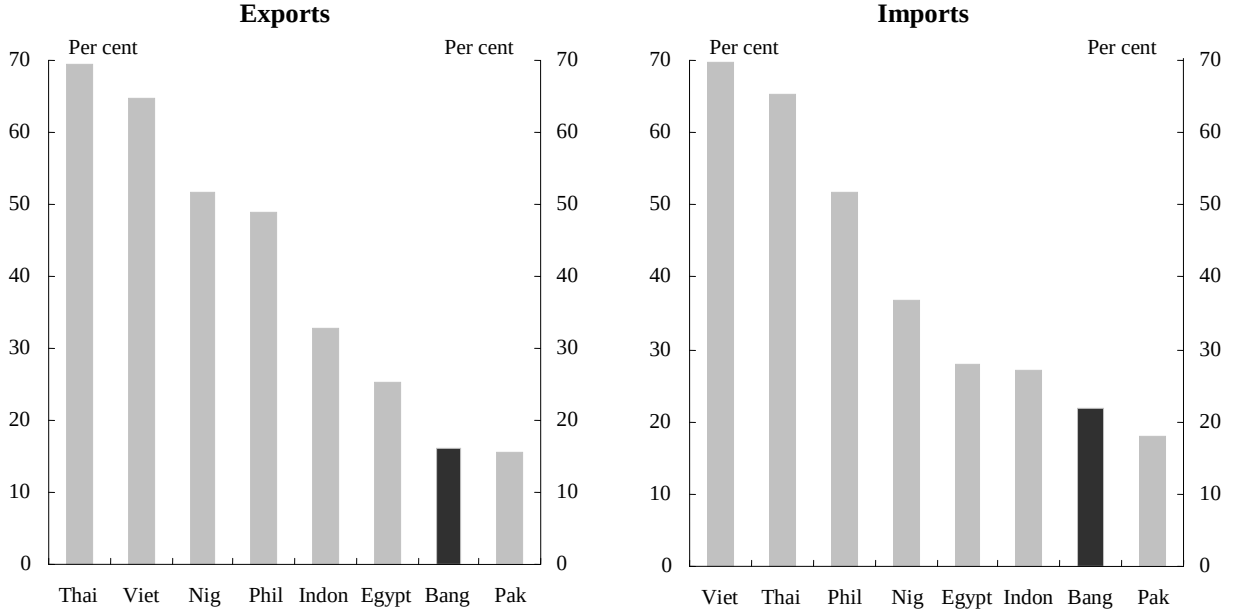
Schooling data for Vietnam from 1990.
Source: Barro and Lee (2000), World Bank.

(FDI); governance and the rule of law; macroeconomic stability; and regulatory and bureaucratic hindrance against investment.

According to the author's estimates, policy settings as at the beginning of the current decade were consistent with a GDP growth of 5 to 5½ per cent a year, slightly lower than the growth rate recorded in the years since. The author identifies the following as factors holding back GDP growth in Bangladesh over the sample period held back GDP growth: failure to benefit from global integration; a lack of financial intermediation; and poor quality of governance such as crumbling law and order or a cumbersome bureaucracy.

We have already seen that Bangladesh trades far less than many comparable countries. While FDI to Bangladesh has increased in the current decade, it remains small relative to GDP when compared with other similar economies. Further, to benefit from the technological spillovers of FDI, the receiving country needs sufficient human capital—an area where

Figure 9: Trade's share of nominal GDP (average 2001-06) — Bangladesh vs the panel



Source: World Bank, Authors' calculation.

Bangladesh lags behind. This would lead further credence to the view that further investment in education (and human capital more broadly) is needed.

Turning to financial intermediation, the picture becomes less clear. As shown above, the finance industry experienced rapid growth in the current decade. The sector has also shown improvements across indicators such as the ratio of non-performing to total loans or market capitalisation to GDP ratio.[15] To the extent that the Bangladeshi finance sector has been able to withstand the ravages of the global financial crisis, it is not self-evident that this industry is as much of a bottleneck to future growth prospects as it may once have been.

Poor quality of governance, on the other hand, is perhaps even more of a bottleneck today than it had been earlier this decade. Whether it is political instability, corruption, worsening law and order, or regulatory or bureaucratic burdens on private agents — firms and consumers alike, it is hard to imagine that things have improved in the current decade.

Ensuring political stability and good governance, along with completing structural reforms that encourage entrepreneurship and facilitate efficient resource allocations, are also key policy challenges identified by Mujeri and Sen (2003). Plus, the authors highlight policies that can assist with better realisation of the gains of globalisation, and address rising inequality — on both counts, improving human capital development can play a key role.

However, political stability and good governance require institutional changes and cultural norms that can take many years, even generations, to become established; and investment in human capital is not likely to yield results until a new generation of better skilled workers enter the workforce. Does this mean Bangladesh is not likely to experience another sustained increase in economic growth — to, say, 7¼ per cent a year — any time soon?

Not necessarily, according to research by the Kennedy School of Government's Dani Rodrik and his colleagues. For example, Hausman, Pritchett and Rodrik (2004) look at 83 cases between 1957 and 1992 when annual GDP growth increased by at least two percentage points and the higher growth was sustained for at least eight years. What set off these economic accelerations? More investment and exports, and a competitive real exchange rate, can give a temporary boost to growth. Financial liberalisation helps for a while. A rise in the terms of trade can spur growth that quickly fizzles out. And political changes matter — turbulence is not good for a growth take-off, and movement towards democracy helps, but movement away from democracy helps even more!

Bangladesh is not in their dataset, but it is instructive

to note that Bangladesh did have a political change in 1990. Their other findings — more investment, exports, and financial reforms, appear to be consistent with what we have discussed above.

But the authors' most important finding is that the growth take-offs are not normally preceded by major economic and political reforms such as dramatic improvement in the political settings or 'shock therapy' style economic reforms. According to the authors, economic accelerations are: *'caused predominantly by idiosyncratic, and often small-scale, changes'*. And recent studies by multilateral institutions lend credence to this view (see World Bank, 2005, for example).

This may appear to give no more comfort about the prospects for a further growth spur in Bangladesh. If it is all random and essentially good luck, then that does not leave researchers or policymakers with many options. However, Rodrik and his colleagues have devised a framework that can assist policymakers with identifying possible small-scale changes that can trigger an economic acceleration. We describe this framework, and analyse its implications for Bangladesh next.

Growth Diagnostics

We describe the growth diagnostics framework, before identifying where the biggest *bang for the buck* might be for the Bangladeshi policymakers.

4A. Growth diagnostics framework

The growth diagnostics framework seeks to identify the largest constraints to economic growth such that authorities can formulate policies targeted specifically to remove those constraints. The approach was developed by Hausmann, Rodrik, and Velasco (2005) as a systematic framework to analyse and classify these constraints.

The constraints are, by definition, the results of distortions and market imperfections, driving "wedges" between the private and social values of economic activities. Following the authors, let us denote these wedges by $\tau = \{\tau_1, \tau_2, \ldots, \tau_k\}$ with τ_i representing the distortion in activity *i*. Let us denote by $\mu s_i (\tau, ...)$ and $\mu p_i (\tau, ...)$ the net marginal valuations of activity *i* by society and by private agents, respectively. Therefore, $\tau_i = \mu s_i (\tau, ...) - \mu p_i (\tau, ...)$.

Let us denote the welfare of the average member of society by *u*. Then, the gain in welfare through reducing the wedge τ_j is given by:

$$du/d\tau_j = -\lambda_j + \sum_i \lambda_i \partial[\mu^s_i (\tau, ...) - \mu^p_i (\tau, ...)]/\partial\tau_j \quad (4)$$

A simple interpretation of (4) is as follows: the first term on the right-hand side is the marginal benefit of removing the wedge τ_j; and the second term is the marginal effect of reducing the wedge τ_j on all other activities in the economy. If the second effect is a net reduction in distortions of other activities, then the overall welfare increases even more. If the second effect is a net increase in distortions of other activities, then the overall welfare declines, and could possibly even be negative if their effects are larger than the primary welfare gains (λ_j) of reducing the wedge.

In the real world, it is difficult to accurately calculate these effects. In such a "second-best" environment, targeting the activities with the biggest distortions makes sense since the larger the value of λ_j, the greater the chances for net gain in overall welfare.

The growth diagnostics approach seeks to identify the biggest constraint on economic growth by attributing a slow pace of economic growth to two proximate factors that inhibit investment: (i) high cost of finance; and (ii) low private returns to investment.

These constraints emit different sets of signals. For example, if the cost of finance were the more inhibiting constraint on growth, we would expect to find high interest rates and chronic current account deficits. In such an economy, an exogenous increase in funds is likely to spur rapid investment. On the other hand, if low return to investment is the major factor constraining growth, we would expect to find low real interest rates, and an exogenous increase in funds to boost consumption, capital flight, or speculative investments (in, say, real estate) that may not add anything to the productive capacity of the economy.

The growth diagnostics approach seeks to identify the more binding constraints through analysing relevant indicators. Once the constraints with the larger "wedge" — that is, with the greater potential to yield benefits from reform — are determined, the set of possible factors behind the constraints are explored.

So, for example, high costs of finance can be due to either: (i) obstacles in accessing international finance (high country risk, high exchange rate risk, adverse investment conditions etc); or (ii) obstacles in accessing domestic finance (low savings, high collateral requirements, improper risk assessment

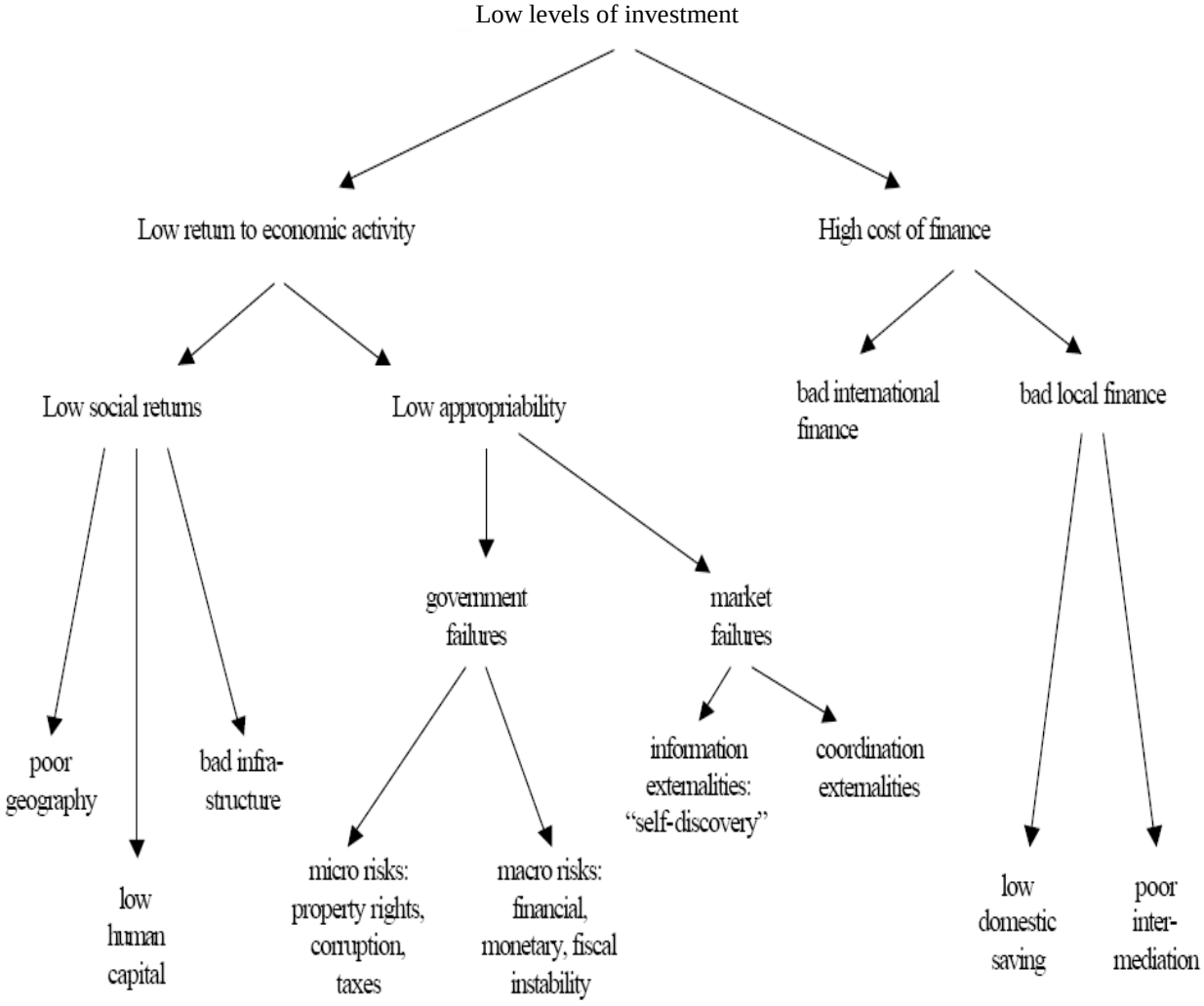
techniques, poor intermediation).

Similarly, low private returns can be caused by either by: (i) low returns to economic activity in society as a whole (in turn caused by poor geography, bad infrastructure, or low human capital); or (ii) low private appropriability of economic returns.

Low private appropriability in turn can be caused by two factors: (i) government/policy failures (macroeconomic risks associated with monetary, fiscal and financial instability; microeconomic risks such as property rights, taxes, capital-labour conflicts); and (ii) market failures (coordination externalities; information externalities: technological spill-overs and uncertainty about the underlying cost structure of the economy).

The approach is visualized as a decision tree in Illustration 1, reproduced from Hausmann, Rodrik and Velasco (2005). Using the growth diagnostics approach, we start from the top and move downwards, eliminating possible explanations of low economic growth, through analysis of available data, in order to identify exactly the most pressing constraint on economic growth.

Illustration 1: Growth diagnostics



Growth diagnostics for Bangladesh

As we have seen in Section 2A above, investment has risen steadily relative to GDP since the 1980s. And yet, as we have seen in Section 3A, Bangladesh lags behind other comparable countries in terms of investment-to-GDP ratio. There is a broad agreement amongst policymakers and researchers working on economic growth that raising investment relative to GDP should increase a country's growth path in the medium term. However, if policies to buoy investment are to succeed, policymakers will need to know what inhibits investment in the first place. Using the approach described above, we explore what constrains investment in Bangladesh, and draw possible policy lessons.

High cost of finance

Is investment in Bangladesh being constrained by high cost of finance? That is, are there investment projects that are not being financed because of a lack of loanable funds?

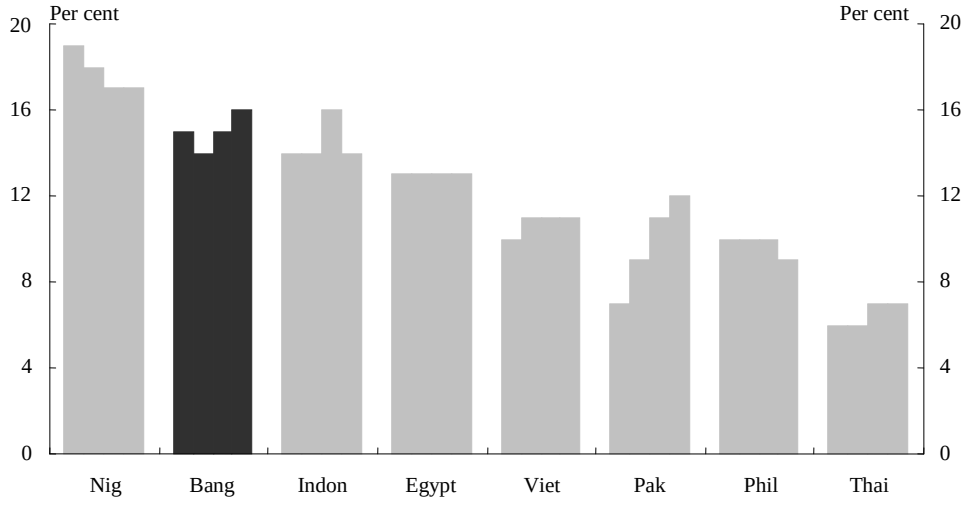
If this were the case, we would expect high interest rates. And yet, lending interest rates in Bangladesh have not been particularly high compared with the benchmark countries during recent years (Figure 10).[16] In addition, had the problem been a lack of domestic funds for investment, we would have expected Bangladesh to experience large current account deficits and run up foreign debts. And yet, the country's current account has been in balance on average in the decade to 2007 (before the impact of the oil price spikes were felt), while the country's external debt has fallen or remained steady relative to GDP since the end of the 1980s (Figure 11).

Of course, the fact that Bangladesh has not incurred large current account deficit is because foreign (and domestic) investors are not willing to put their money in Bangladesh. This could be because Bangladesh is not deemed creditworthy. But with no recent history of defaults or balance of payments crisis, this does not appear likely. Rather, we believe a more plausible reason is that investors — foreign and domestic — do not find sufficiently high return on economic activities in Bangladesh.

Low social returns

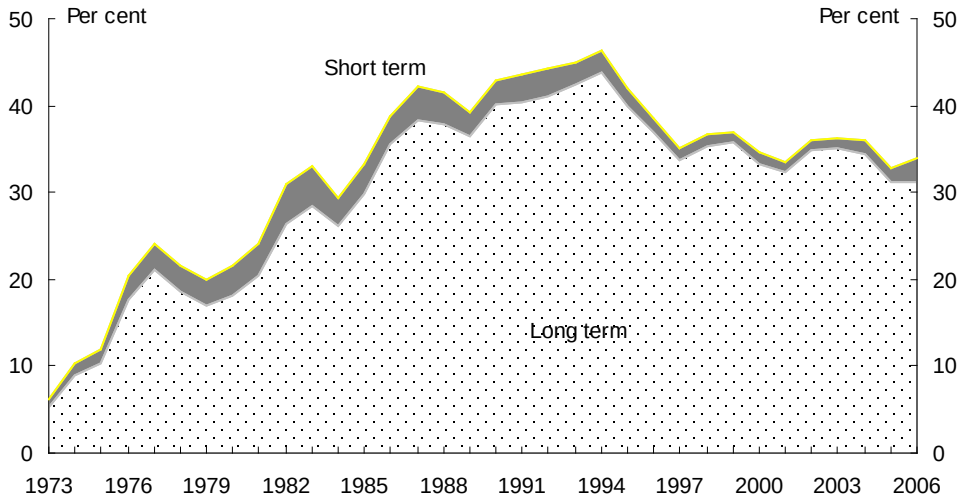
The question then is, what causes low rates of return to economic activity? One answer is that there may be low social returns.

Figure 10: Lending interest rates
— Bangladesh vs the panel (2004-07)



Source: World Bank.

Figure 11: External debt relative to GDP



Source: CEIC Asia database, authors' calculation.

Geography is frequently considered as an underlying source of poor social return to economic activities. Geography has been shown to affect economic prosperity either directly or through their interactions with institutions governing economic activity — Sachs and Warner (1997) find tropical or land-locked countries to be more likely to have slower economic growth, while Sachs (2001) finds that tropical environments tend to have poor crop yield and worse disease environment. However, Bangladesh is neither a tropical nor a land-locked country. Situated between the economic powerhouses of India and China, it is not immediately obvious that poor geography affects returns to economic activity in Bangladesh.

Low human capital is another reason that can inhibit social returns to economic activity. As we have seen, Bangladesh lags behind comparable countries in terms of educational attainment. On some measures (such as the proportion of people with some secondary school education), not much gain seems to have been made in the 1990s. And Bangladesh has not been spending as much on education as many other comparable countries.[17]

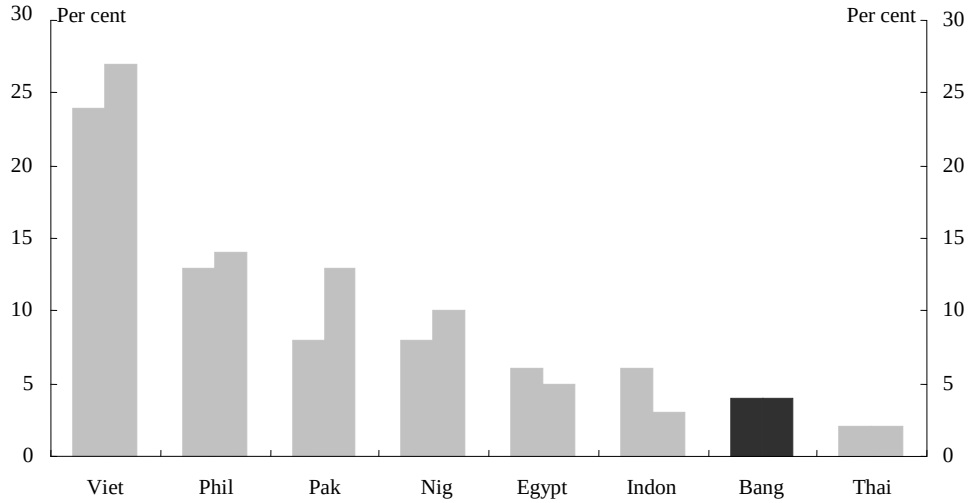
With a poorly educated workforce, Bangladesh is unable to take full advantages of globalisation. Our firms are less able to adopt technologies from more advanced economies. Investors are less likely to try ventures that require specialist skills. Low human capital, it is clear, is one of the binding constraints on economic growth in Bangladesh.

Policy conclusions here, however, are far from obvious. The link between expenditure on education and educational outcome, and the thread connecting educational outcomes to economic growth, are complex and poorly understood. For example, despite spending less of its GDP on public education, Indonesia has attained higher educational outcomes than Bangladesh. And despite having a significantly better educated workforce, Philippines has not done any better than Bangladesh in terms of economic growth. More generally, Pritchett (2001) and Easterly (2002) show that it is far from clear that higher educational attainment will automatically lead to faster economic growth.

A lot depends on the demand for a more educated workforce. For example, in a country where there is little demand for educated workers, increasing the supply of education will likely lower the return to education. Is this likely to be the case in Bangladesh?

Asadullah (2005) finds that each additional year of schooling, on average, raises income by about 7 per cent in Bangladesh. This is similar to returns to an additional year of schooling in Australia or the United States (Miller, Mulvey and Martin 1995). To the extent that Bangladesh has a much smaller stock of human capital than these advanced economies, one might expect returns to schooling to be significantly higher in Bangladesh.[18] That this is not the case may be consistent with the idea that there is not sufficient demand for an educated workforce in Bangladesh. On the other hand, had there been a large excess supply of skilled labour, we would expect to see high exodus of educated people from the county. And yet, Bangladesh has experienced relatively low rates of skilled emigration compared with similar countries (Figure 12).

Figure 12: Tertiary educated emigrants (proportion of total tertiary educated) — Bangladesh vs the panel (1990, 2000)



Source: World Bank.

Alternatively, there may be demand for educated workers, but such demand comes from *'individually remunerative but socially wasteful or counterproductive activities so that while individual wages go up with education, aggregate output stagnates or even falls'* (Pritchett, 1998). What kind of activities could Pritchett have in mind? Murphy, Shleifer and Vishny (1991) present a simple model in which entrepreneurial talent flows to rent seeking if that is where the returns are the highest. To the extent that a model such as this describes the Bangladeshi reality, simply raising educational attainment without reforms elsewhere in the economy may actually be counterproductive.

In addition to problems with the demand for education discussed above, there may well be problems with the 'supply' of education.[19] For example, if the education policy focuses heavily on primary education, it may result in more schools but not enough teachers.

This is not to suggest that Bangladesh should not invest more on education (or human capital more broadly). Bangladesh has far less average years of schooling than did any of the Newly Industrialised Economies of Asia in 1960, *before* their economic take off even started.[20] As such, it is very likely that Bangladesh needs to make significant investment on education. The crucial point here is that a lot more research is needed to understand the intricacies of education and economic growth in the context of Bangladesh. Without such understanding, there is a risk that education policies may be futile or even counterproductive in terms of their impacts on economic growth.

In addition to low human capital, poor infrastructure might be another factor drawing back investment in Bangladesh. According to the World Bank, for example, Chittagong port — through which 85 per cent of Bangladesh's international trade occurs — is far less efficient than Pakistan's Karachi (Toure, 2007). Only about a tenth of the country's roads were paved in 2003. One needs to be in Dhaka for barely a few days to appreciate the phrase 'infrastructure bottleneck'. And whether in terms of passengers carried or goods transported, Bangladesh's railway is far less efficient than most comparable countries (Table 2).

The situation is perhaps worse when one turns to electricity. Chronic power shortages have been dubbed as potentially a bigger threat to the country's economy than the global financial crisis. And yet, per capita electricity consumption in Bangladesh had been lower than all comparable countries save Nigeria in the first half of the 2000s (Figure 13). As the economy grows, surely the energy shortage will only worsen unless drastic actions are taken.

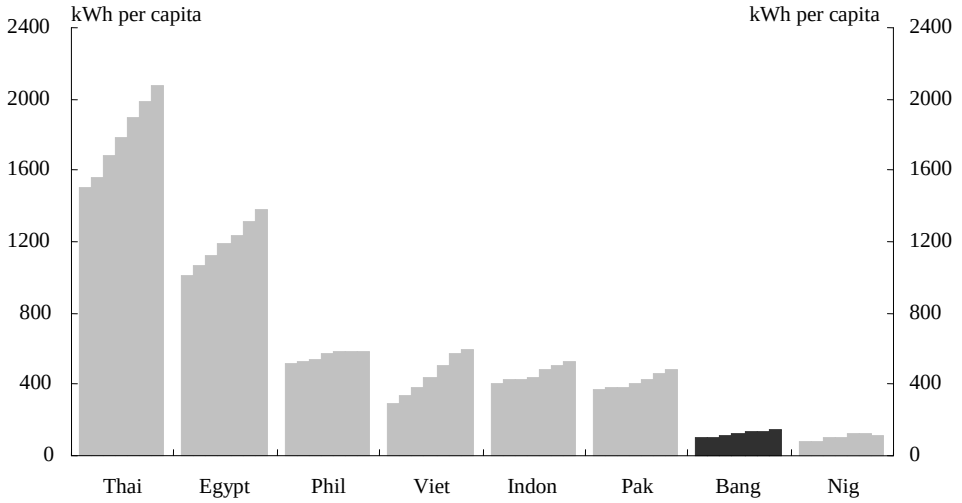
Compared with education, the nature of externalities associated with transport or energy infrastructures are much better understood. Policymakers also have a much better handle on the marginal social costs and benefits of different infrastructure projects. As such, it stands to reason that tackling infrastructure bottlenecks should be among the highest priorities of the country's policymakers.

Table 2: Railway efficiency — Bangladesh vs the panel

	Goods transported (million ton per km)	Passengers carried (million passenger per km)
Pakistan	*5907*	*25621*
Indonesia	*4698*	*25535*
Thailand	*4037*	*9195*
Egypt	*3917*	*40837*
Bangladesh	*817*	*4164*
Nigeria	*77*	*174*

Data for Indonesia and Thailand are for 2006, all others are 2007.
Source: World Bank.

Figure 13: Electricity consumption per capita — Bangladesh vs the panel (2000-06)



Source: World Bank.

Low appropriability

In addition to possible low social returns, investment in Bangladesh could be constrained by low appropriability of private returns. Low appropriability could arise from a set of market failures as well as governance problems. We discuss both possibilities below.

Market failures hampering investment can arise out of information asymmetries or co-ordination failures. Information problems abound, for example in the small and medium sized enterprises (SMEs) sector. Many SMEs, which fail to overcome the information impediments that result in lack of access to both short-term and long-term financing, access to end markets, and supply networks, do not become fully sustainable business ventures. Similar issues might also explain why many service industries are yet to reap full benefits of digital communication. Much more research is needed to understand the nature of market failures inhibiting technology adoption or investment at the firm or industry level.

Co-ordination externalities such as path dependency are very much present in Bangladesh. Development of the ready-made garments sector — the country's chief exports product — is a classic case of such path dependency (Easterly, 2002). However, no other product has followed as an export staple in the past decades. Of course, poor infrastructure or low stock of human capital constrains investment in new export products. Nonetheless, as we have seen, Bangladesh trades a lot less than comparable countries.

The most successful development model in the past six decades has been to rely on manufacturing exports to the developed economies, use the income generated from trade to invest in physical and human capital while importing product and process innovation to spur MFP growth, and raise living standards. And yet, it is not clear that this export-led development could be sustained in the wake of the global financial crisis. With massive budget deficits

and likely double-digit unemployment rates, protectionism in the developed world is a genuine risk. Protectionism aside, the economic recovery in the developed world is likely to be accompanied by increased household savings, and by implication, subdued consumption. This suggests that the traditional exports-led growth strategy so successfully adopted by many East Asian economies may not be available to Bangladesh. The implications for trade policy are profound. Every effort should be made, using multilateral and bilateral means, to find new export markets and maintain existing ones. And in the meantime, protectionism to shelter inefficient domestic firms should be resisted.

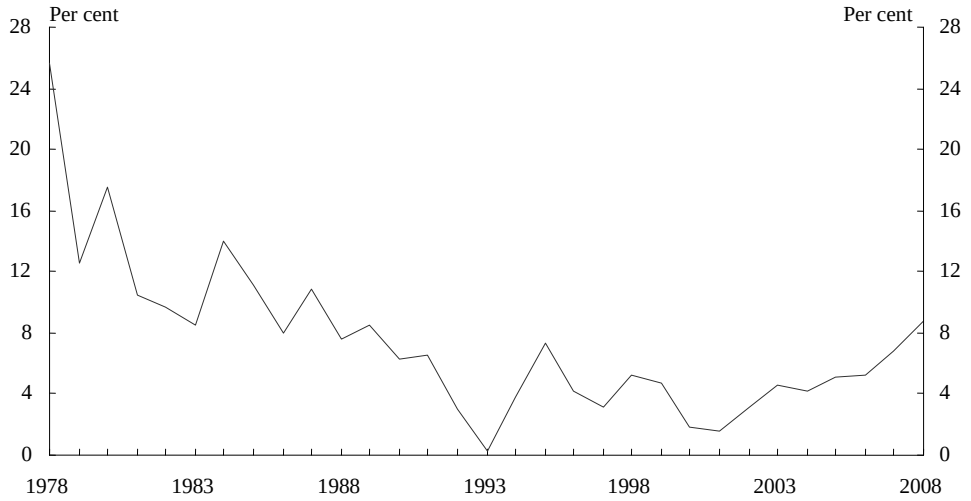
However, trade policy on its own will not be successful unless other constraints are addressed. And some of these constraints can come from governance failures. We can classify governance failures into problems of macroeconomic management and microeconomic governance. At first glance, it appears that Bangladesh has done relatively well on the former count, but the latter is a major binding constraint on investment and economic growth.

Let's start with macroeconomic management. As illustrated, not only has Bangladesh been growing faster since the end of the 1980s, growth itself has become less volatile in this period. In addition, recent rises notwithstanding, inflation in Bangladesh has been generally moderate in the past three decades (Figure 14).

High taxes may be a threat to private appropriability of economic returns. However, in Bangladesh, the opposite may be the case in the sense that the country has one of the lowest tax-to-GDP ratios in South and South East Asia. Indeed, low tax revenue is cited by successive governments as a reason to not increase expenditure on education or health. Nonetheless, despite low taxes and steady budget deficits, public debt to foreigners as a share of GDP had steadily fallen from nearly 11 per cent in 1997 to less than 6 per cent a decade later, reducing the risk of a currency crisis. Therefore, macroeconomic management does not appear to be a major threat to private appropriability to Bangladesh.

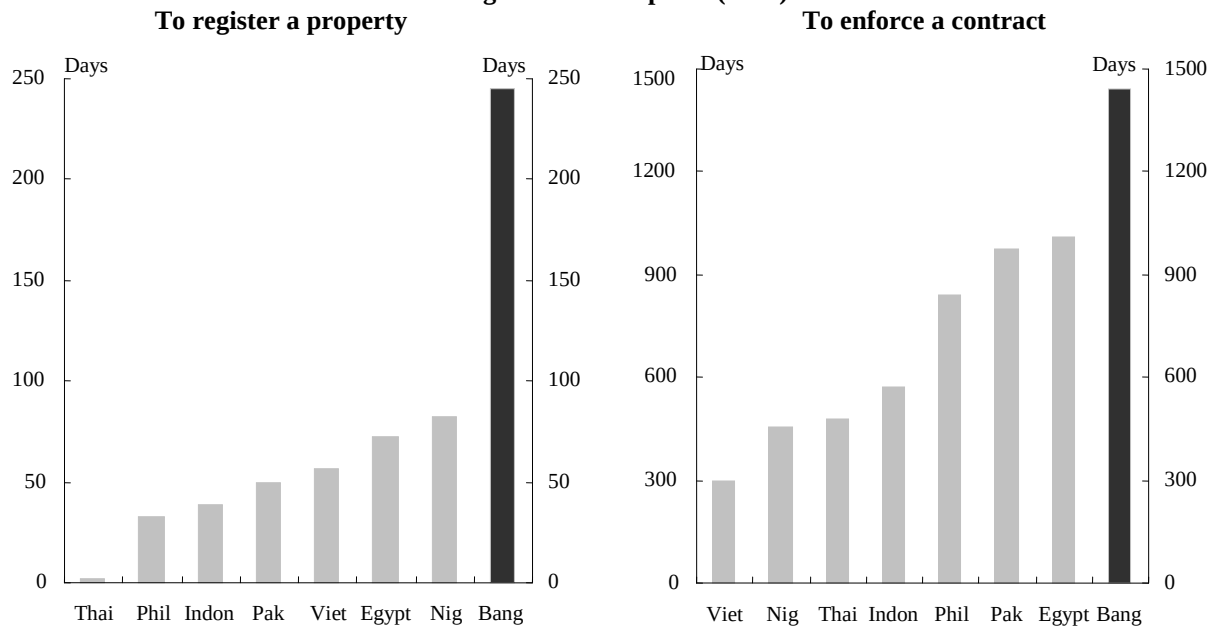
The same, however, cannot be said about microeconomic governance. Much has been said, for example, about the endemic corruption that pervades every sphere of life in Bangladesh. We do not spend any time on this issue except to note two points. First, recent experiences suggest that there is no quick fix to curbing corruption. Indeed, unless carefully crafted, anti-corruption efforts could well do more harm than good to the economy.[21] As such, much more research is required to design an appropriate anti-corruption strategy for Bangladesh. Second, reducing corruption would very likely raise investment and GDP growth, eliminate rent, and achieve allocative and distributive efficiency (Svensson, 2005). However, to the extent that Bangladesh has experienced steady economic growth despite all pervasive corruption, it is far from self-evident that corruption is a binding constraint on investment.

Figure 14: Growth in GDP deflator



Source: BBS, World Bank, authors' calculation.

Figure 15: Days needed to satisfy regulatory requirements — Bangladesh vs the panel (2009)



Source: World Bank.

There are, however, many other ways for the government to facilitate a business friendly economy. In 2009, Bangladesh ranked 110th in the World Bank's 'Doing Business' Index, while Thailand ranked 13th. It takes eight months to register a property, and nearly four years to enforce a contract, in Bangladesh (Figure 15).

It is likely to be far easier to simplify procedures and improve the regulatory regime than curb corruption. Indeed, to the extent that poor regulations and cumbersome bureaucracy breeds corruption, regulatory reforms may well facilitate a lasting reduction in corruption. As such, tackling poor regulatory frameworks would appear to be a sensible priority for the country's policymakers.

Conclusion

We started this paper by observing that the Bangladesh economy accelerated around 1990 — which we showed was driven by a combination of macroeconomic stability, and openness — and then posing the question: *Is there some action the government could take that would lead the Bangladesh economy to increase its growth rate by another 2 percentage points?*

We have tried to answer this question by using the *growth diagnostics* framework developed by Dani Rodrik and colleagues. This framework is one way to systematically think about where small policy changes could make the greatest difference. As far as we are aware, ours is the first application of the growth diagnostics framework for Bangladesh.

From the growth diagnostics analysis, we have highlighted factors that act as breaks on a further sustained rise in economic growth: low levels of human capital; poor infrastructure; market failures specific to individual sectors; low levels of trade; corruption; and cumbersome regulations.

We conclude that the country's policymakers should devote their attention to: tackling infrastructure bottlenecks; open new export markets, maintain existing ones, and resist protectionism; and reducing regulatory and bureaucratic burden on the private enterprises.

Further, we argue that significant research is needed on understanding: the interplay between education and economic outcomes in the Bangladeshi context; the role of various market failures in shaping specific industry characteristics; and possible contours of a feasible anti-corruption strategy.

Needless to say, our 'growth diagnostics' analysis should be viewed as a preliminary first step. Much more could be done, utilising richer data sets as well as case studies. Future studies will also benefit from inputs from practitioners with in-depth country experience. And finally, further analysis should explicitly take into account distributional aspects of different policies.

Acknowledgements

We are grateful to Syeed Ahamed, Rumi Ahmed, Pial Islam, Farida Khan, Towfiqul Islam Khan, Naeem Mohaiemen, Mustafa K Mujeri, Munir Quddus, Mustafizur Rahman and Asif Saleh for their comments and suggestions. All errors are ours, and ours alone.

Endnotes

1. Unless otherwise stated, Bangladeshi data are for financial years that end on 30 June. All data are valid as at December 2009. Newer vintage data are unlikely to change the broad conclusions.

2. The official Bangladesh Bureau of Statistics GDP series only dates to 1990, and the apparent volatility in the data in the earlier decades may well be a reflection of poor estimates by the World Bank. See Appendix A.

3. Since prices of different components of GDP(E) typically grow by different rates, nominal shares usually provide a better gauge of their relative importance in the economy. In Bangladesh, real (1995 prices) data do not make significant difference to the investment and exports' shares of GDP. Imports' share of GDP using the real data was very high in the 1960s before falling sharply in the early 1970s (when import prices recorded a 16-fold increase). Real imports' share of GDP has been similar to the nominal series since the early 1970s.

4 While this may suggest that Bangladesh has been reaping the demographic dividend of the past population explosion in recent decades, the story is more complicated. Using World Bank's labour force data for 1980-2006, we find that contributions made by demographic change to GDP growth have been broadly offset by falls in labour force participation rate. This was particularly the case in the early 1990s, when the female share of labour force fell. This result appears surprising in light of the rapid growth of the ready-made garments industry that heavily employs women, but may reflect a relative increase in the number of women of child bearing age during that period. That is, the same demographic change that caused positive contribution to GDP growth also partly off set that contribution by lowering participation rate.

5. The model assumes constant capital and labour elasticities of output, and constant capital and labour shares of income. The standard text book neoclassical assumptions may well be too strong for a developing economy such as Bangladesh.

6. Our interest is in the long run, particularly in the estimated co-efficient α and what it implies for the relative contribution of capital deepening and MFP growth. Labour productivity and the capital-labour ratio wander over time, suggesting estimation of a short-term equation within an error-correction framework if the aim is to understand short-run dynamics of labour productivity growth. We estimate an error correction specification of the model, allowing for a trend break in the late 1980s / early 1990s. While the coefficient is positive on a trend break anywhere between 1989 and 1993, it is most significant in 1990. That is, there is clear evidence in the data that there was a trend pick up in productivity, and thus economic, growth around that time.

7. This is described in detail in Appendix A.

8. This accords well with the literature, which typically find capital's share to be between 0.3 and 0.6.

9. These are: Cobb-Douglas functions without human capital, and physical capital's share ranging from 0.3 to 0.45; Cobb-Douglas functions with human capital augmenting labour input in one and appearing as a separate input in another; and a translog function.

10. Pre-war GDP was not reached until 1978, and pre-war GDP per capita was reached only in 1993.

11. Mexico and Turkey have the population and per capita income in the specified ranges, but both are members of the OECD. All the countries in the panel bar Thailand are in the Goldman Sachs'

N-11 (which includes Bangladesh) grouping of emerging markets that are expected to grow strongly in the coming decades (Wilson and Stupnytska, 2007).

12. There is a lot more to human capital than education. However, for simplicity and brevity, we focus solely on education in this paper.

13. Despite having the highest educational attainment in terms of average years of schooling, Philippines has grown more slowly than Bangladesh in recent decades. We shall revisit this point in Section 4.

14. Public expenditure on health relative to GDP has also lagged behind in Bangladesh compared with the benchmark countries.

15. And reforms, such as full implementation of Basel II, have been attempted.

16. Hausmann, Rodrik and Velasco (2005) diagnose Brazil, which had lending rates of over 40 per cent during this period, to be suffering from high cost of finance.

17. Again, for simplicity and brevity, we focus on education, even though there is a lot more to human capital.

18. This assumes that education, or rather human capital, exhibits diminishing marginal return. In some models of endogenous growth, this is not the case. See Chapter 10, Aghion and Howitt (1997) for a detailed discussion.

19. Another possibility is that education is a 'signalling device' that proves innate ability, but does not necessarily increase skills. First suggested by Spence (1973), this possibility has profound implications for designing education policy. We abstract from this possibility for simplicity and brevity.

20. Newly Industrialised Economies are Korea, Taiwan, Hong Kong, and Singapore.

21. The 'law and order' approach to anti-corruption adopted by the then government led to an investment slump in 2008, when nominal investment-to-GDP ratio fell for the first time since 1991.

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APPENDIX A: DATA

Detailed data available on request.

National Accounts

Real and nominal national accounts are published annually by the BBS from 1990. The World Bank has a nominal level series and a real index series to 1960 that are consistent with the BBS series after 1990. We combine the World Bank and the BBS data.

Demographic data

The United Nations Population Database (http://esa.un.org/unpp/index.asp?panel=2) provides total population levels annually and age-specific population levels at a five-yearly interval (which we interpolate annually).

Capital stock

Let K_0 be capital stock at time *0*. $K_0 = \frac{I}{g+\theta}$ where *I* is investment, *g* is GDP growth, and θ is depreciation. We calculate the capital stock using this definition, the national accounts data described above, and by assuming θ=4.27 per cent following Mahajan (2005). We grow that stock thus: $K_t = \theta K_{t-1} + I_{t-1}$.

Barro and Lee (2000) dataset

This dataset is available here: http://www.cid.harvard.edu/ciddata/ciddata.html.

World Bank datasets

- World Development Indicators. The data are available to subscribers. Details here:
- http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,menuPK:232599~pagePK:64133170~piPK:64133498~theSitePK:239419,00.html

- Doing business index. Detailed data available here: http://www.doingbusiness.org/CustomQuery/