



What Do We Know About Growth Patterns in Pakistan?

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Abstract

This paper explores stylized facts of Pakistan's growth patterns. It identifies the short-lived predominant character of its increasingly scarce growth accelerations, the average volatility of the growth rate by international standards, the high but decreasing correlation between overall growth and agricultural growth, the long term decline of its growth (potential) rate to around 4.5 percent, well below the 6 percent rate of the 1960s or from the 7 percent rate required for absorbing the young labor force. It also explores the dramatically steady fall in productivity during the 2000s (measured by Total Factor Productivity) and, to a lesser extent, capital accumulation as main reasons of such decline. The paper analyzes the role factor accumulation plays in long-term labor reallocation across sectors, with industry stalling, agriculture still playing a major role that goes beyond its own contribution to GDP, and services playing an increasing role in creating employment, but on low productivity jobs. Growth acceleration is not assured and Pakistan will need to create more jobs moving from agriculture to industry and services in activities where productivity is higher, but to do this, curbing the factors that constraint growth—overall and sectoral—and Total Factor Productivity in particular will be essential.

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What Do We Know about Growth Patterns in Pakistan?

J.R. López-Cálix, T.G Srinivasan and Muhammad Waheed

This paper was motivated by World Bank's extensive support to the design of the new Framework for Economic Growth of Pakistan. It was prepared by Jose R López-Cálix, Lead Economist, T.G Srinivasan, Senior Economist and Muhammad Waheed, Economist (SASEP), World Bank. An early version of this paper was submitted as an input to the SAR Flagship Report "More and Better Jobs in South Asia 2012," thus benefitting from its extensive reviews.

An Economy Prone to Booms and Busts

1. Booms and busts are no news to Pakistan's economy. In the 1960s, 1980s and the period between 1999 and 2005, all booms occurred under military regimes—Ayub Khan, Zia ul Haq and Pervez Musharraf respectively. Gross Domestic Product (GDP) per-capita growth reached averages above 4 percent a year (Figure 1). Not only political stability, but high levels of external aid and ability to push through reforms appear associated to growth spurts (World Bank 2010).¹

2. By contrast, stagnation and busts during the 1970s and the 1990s have kindled debates about the trade-off between growth and democracy. In the past, political instability was blamed because none of the democratic regimes (except the one under Zulfikar Bhutto in 1970s) lasted their full term. The 1990s were particularly worrisome as the alternation between Benazir Bhutto and Nawaz Sharif took place every two years or so—precisely when growth performance was poorest. As democratic governments failed to deliver high growth (and related poverty reduction), increasing public apathy toward the electoral process unfolded. Voter turnout in Pakistan declined from 47 percent in 1977 to 31 percent in 1997. It is even more troubling that the trade-off has been internalized to the extent that growth expectations have become progressively less optimistic and compounded by concerns about the security situation in the country.

3. Whereas empirical evidence strongly supports the view that military regimes have achieved higher rates of growth than democratic regimes for Pakistan, this conclusion deserves a few caveats. Granted, between 1960-61 and 2008-09, Pakistan's average rate of growth was 5.3 percent. Military regimes reached an average 6 percent rate of growth vis-à-vis an average 4.3 percent for democratic regimes. However, Burki (2007a) points out that this performance gap is not due to the fact that military provided better economic leadership, but to political stability and policy continuity, which were supported by generous external aid (also benefitting military outlays). Hussain (2009) points out that these military regimes were also unsustainable, as the lack of political legitimacy finally undermined their durability. Khan (2007) compares the Musharraf regime (1999-2007) to the preceding democratic regimes (1988-99) and finds slightly better performance in terms of GDP growth, but worse in terms of social indicators, which could explain their limitations. Hussain (2009) also concludes that the narrowly based elite, advancing its private and parochial interests, is the true decision-maker; determining regime changes (and growth patterns) in Pakistan.

Featuring Short-lived Growth Accelerations

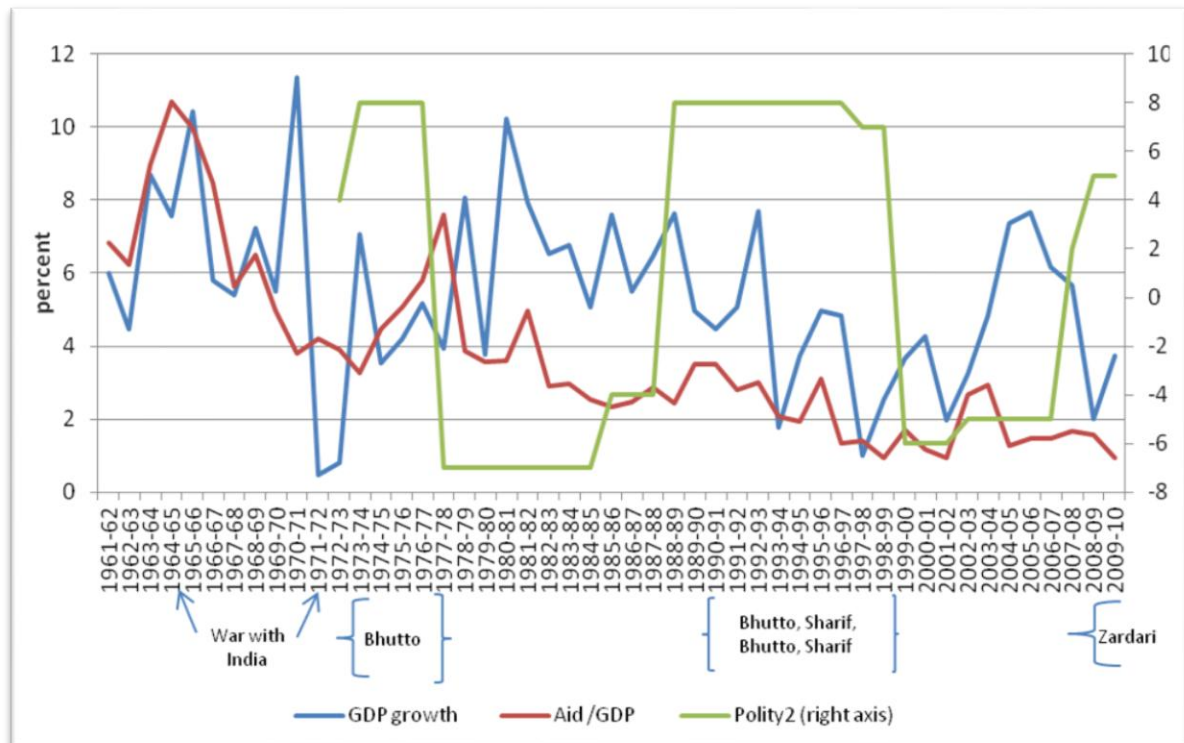
4. Pakistan's high-growth episodes tend to be short-lived, although longer than low-growth periods. Despite that, over the last fifty years the economy has grown on average by around 5.4 percent per year—its growth pattern is full of short cycles of rapid growth followed by stagnation. Indeed, the country has not been able to sustain high growth for more than only a few years. Haussmann, Pritchett and Rodrik (2004) define growth accelerations as periods with an increase of GDP per-capita growth of 2 percentage points or more for at least 8 years.² Accounting for population dynamics, such a figure would be

¹ Simple correlation between aid/GDP and GDP growth is 34 percent, including remittance receipts it goes up to 44 percent.

² Their filtering technique also requires a post-acceleration growth rate of at least 3.5 percent a year and post acceleration GDP to be above pre-acceleration levels.

roughly equivalent in Pakistan to an increase of at least 5 percent in GDP growth rates. Generally speaking, these growth accelerations tend to be correlated with increases in investment and trade, real exchange rate depreciations, and with political regime changes (Hausmann, Pritchett and Rodrik 2004). Furthermore, external shocks tend to produce growth accelerations that fizzle out; while economic reform remains a significant predictor of accelerations that are sustained.

Figure 1 Pakistan GDP Growth under Military & Democratic Regimes 1969-2010



Source: World Development Indicators and Polity IV project (<http://www.systemicpeace.org/polity/polity4.htm>); Polity2 is an indicator of democracy with scores range from +10 (best) to worst(-10).

5. Applying this axiom to Pakistan, rules out any episode of growth acceleration over the last fifty years. Since 1962, there have been only two periods where growth consistently remained above 5 percent per annum for more than 4 years. This is despite the fact that over the 50-year period, growth remained above 5 percent for 28 years (Table 1). Hence, episodes of robust growth are frequent, but not sustained. This is not the case in many comparable countries in the region such as India, China, Malaysia and South Korea, which have all managed to grow at relatively high rates for a considerable period of time. Therefore, Pakistan finds it difficult to achieve sustained periods of high growth as its growth performance remains uneven and features repeated turning points after a few years.

Table 1 Pakistan: Growth Accelerations

High Growth > 5%			Low Growth < 5%			Total	
Periods	Episodes of Growth (Consecutive Years)	Average Growth	Periods	Episodes of Growth (Consecutive Years)	Average Growth	Years	Average Growth
FY78-FY83	6	6.9%	FY97-FY03	7	3.3%	50	5.4%
FY62-FY66	5	7.3%	FY08-FY11	4	2.9%		
FY85-FY88	4	6.8%	FY75-FY77	3	3.3%		
FY04-FY07	4	7.3%	FY71-FY72	2	1.8%		
FY68-FY70	3	7.7%	FY89-FY90	2	4.6%		
FY73-FY74	2	7.1%	FY93-FY94	2	3.2%		
FY91-FY92	2	6.5%	FY67	1	3.1%		
FY95-FY96	2	5.8%	FY84	1	4.0%		
Total	28	7.0%	Total	22	3.3%		

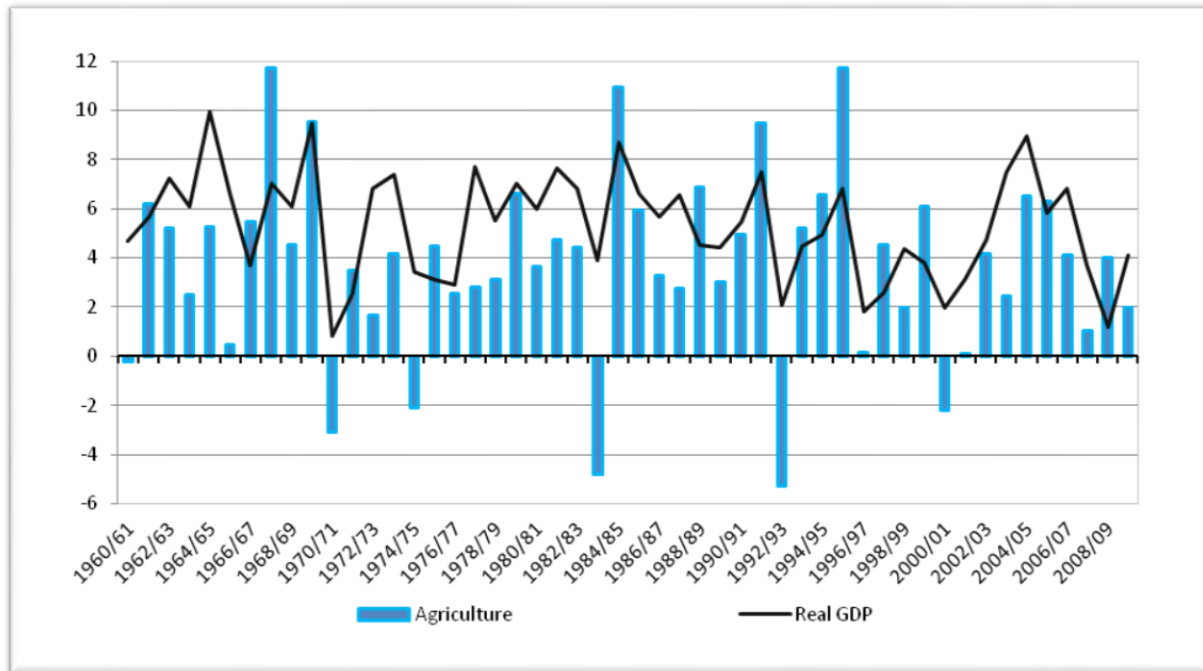
6. Growth volatility has been wrongly associated with short-lived growth. Strictly speaking, volatility and uncertainty are not exactly synonymous as the former refers to the overall variation of one variable around some central trend, while the latter refers only to the unpredictable part of such variation. Contrary to common statements in the literature, Pakistan’s growth volatility is average when compared to worldwide levels. Over the last five decades, the volatility of its GDP growth, as measured by the standard deviation of the growth rate of real GDP, was 2.2 percent; near about the average in South East Asia, and second lowest worldwide after Organisation for Economic Co-operation and Development (OECD) countries—the least volatile region in the world (World Bank, 2000). Our estimates, however, also point out to a steady increase in real GDP volatility in the last three decades, rising from 1.4 in the 1980s to 2.5 in the 2000s.

Still Relying on Agricultural Sector and Prone to Natural Disasters

7. Pakistan’s non-sustained growth performance is also due to its strong, albeit declining, reliance in the agricultural sector. Although agriculture has gradually halved its share of GDP from 42 percent in 1960 to 21 percent in 2009, Figure 2 shows the existence of a high correlation between real GDP and real agricultural GDP—even though such correlation weakens in the 2000s—as services sector has the largest share in the economy.³

³ It would be useful to provide employment by sector at the same time as discussing GDP contribution so (a) the industrial transition is clearly understood, (b) the different levels of worker productivity in the three sectors comes out, and (c) agricultural income as a critical support for domestic demand is implied. The last point will help understand how exactly agriculture correlates with overall GDP growth, as export agriculture is important but relatively small.

Figure 2 Correlation between Agricultural & Real GDP Growth Rates (%)



Source: World Bank staff elaboration

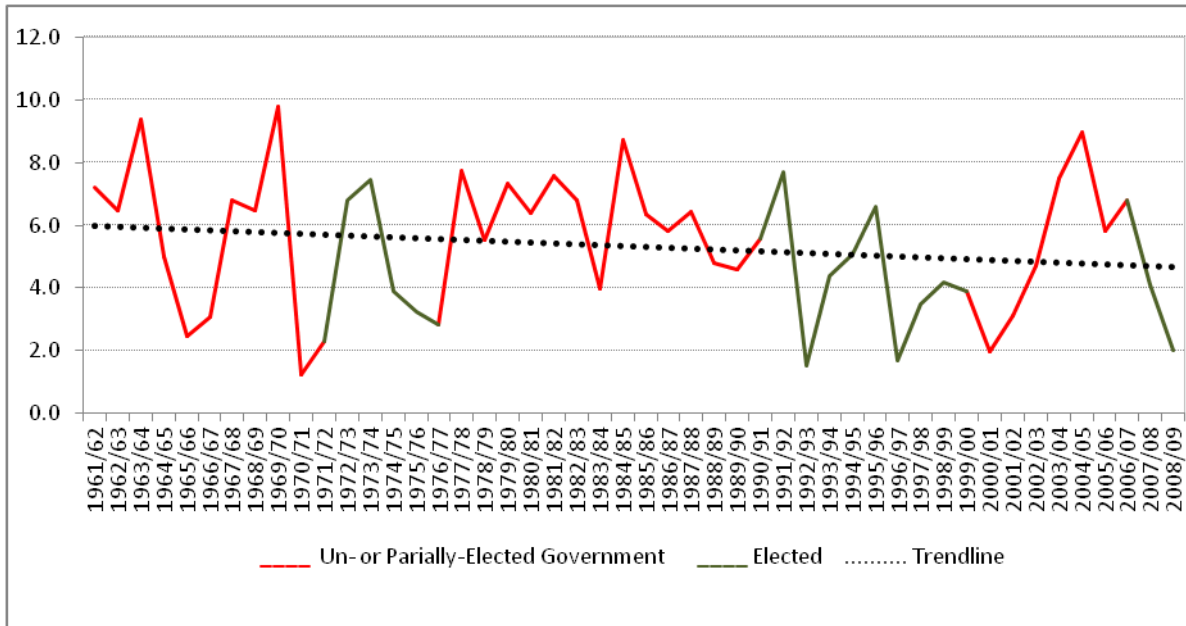
8. Political uncertainty and natural disasters have also contributed to growth reversions. Haussmann, Pritchett and Rodrik (2004) mention that international experience suggests that growth spurts also coincide with regime changes. Looking closely at Pakistan’s economic history, above average growth rates in the 1960s and 1980s coincided with episodes of reform and economic and political stability along with high levels of external aid. In contrast, during the 1970s and 1990s, political upheaval, economic uncertainty and regional tensions were accompanied by few or incomplete reforms and, toward the end of the 1990s, macroeconomic instability and the resulting inability of policymakers to implement and sustain policies necessary for growth and poverty reduction (Figure 3). Thus, on empirical terms, political uncertainty—using external aid and/or workers’ remittances inflows as its proxy—also accounts for a significant explanation of growth dynamics. Over 5 decades, the simple correlation coefficient between the aid/GDP ratios and GDP growth rates is 0.34, and it reaches 0.44 percent when adding remittances receipts. In addition, natural disasters have made their toll in explaining a few episodes of growth reversion. This is certainly the case of the late 2000s—a period that witnessed 4 natural disasters in 5 years, and more recently 2010-11 with the floods.

With Growth Potential on a Declining Trend

10. Pakistan’s economy is on a declining long run trend both in potential and actual growth. Perhaps more disturbing than the inability to sustain growth spurts over long periods of time, is the steady fall in the economy’s potential, which would suggest the country has gradually eroded its strengths over time. To estimate potential growth we use a simple linear trend (LT) and a more refined Hodrick-Prescott (HP) filtering technique. Our findings suggest that (a) potential growth (LT and HP trends) has been falling over the past

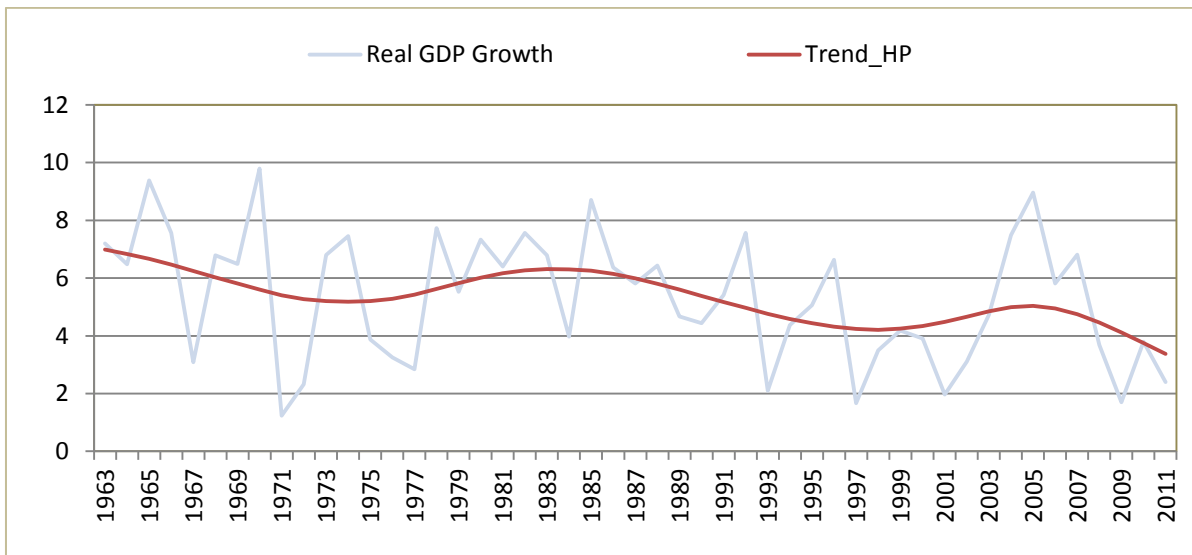
50 years and (b) actual growth is below trend, i.e. the economy is underperforming (Figures 3 and 4).

Figure 3 Linear Trend in Real GDP Growth (%), 1961-2009



Source: World Bank staff elaboration

Figure 4 Pakistan: Actual and Trend Economic Growth, 1961-2009



Source: World Bank staff elaboration

11. The graph allows distinguishing the period before and after 2007. The former features a demand-driven boom, led by credit expansion: between 2003 and 2006 private credit grew at annual rates above 20 percent (and 33 percent in 2004-05). As a result, economic growth rose to 7.5 percent in 2004 and overheated at 9.0 percent in the following year, but reversed afterward. In 2008, the global crisis put an end to this cycle and Pakistan fell into stagflation, i.e. low growth and double-digit inflation rates. Since then, Pakistan's economy has been struggling for a mild recovery, but the 2010 floods, erratic macro-policies

and adverse oil and food international prices have contributed to a returning stagflation—this time an under-heating economy.

12. Pakistan growth potential is eroding. Figures 3 and 4 also show that in the last fifty years Pakistan's steady annual GDP growth rate has fallen from 6 per cent to about 4.5 percent. This rate is much lower than the 7 percent the Government estimates is needed to absorb youth employment (Planning Commission 2011). Therefore, unless the Government adopts a new growth strategy and implement it successfully, the country will continue depreciating its assets and constraining its productive capacity. What is wrong with Pakistan's economic growth? The findings of a growth accounting model often provide useful insights about the reasons underlying such decline.

Long Term Declining Growth Can Be Associated to Falling Productivity

13. Growth accounting models are perhaps the most popular ones in the academic literature of Pakistan.⁴ In general, they are well known both by their methodology of estimation as well as by their application to 2-factors of production—capital and labor inputs (Annex 1). In this section, we apply the growth accounting framework to 4 factors of production: capital, labor, human capital (measured by years of schooling) and land (measured by arable land). We proceed stepwise: first, we separate the individual contributions of labor productivity (output per worker) and labor accumulation (employment) to real output growth; and second, we estimate the contribution of capital, human capital, land and TFP to labor productivity. Being the residual term, TFP measures the particular combination of changes in technology and changes in efficiency with which inputs are used.

14. Our overall empirical findings replicate (and expand) some of the conclusions found in previous growth accounting models over the past thirty years. These are:

- a. growth in Pakistan has been mainly driven by labor and capital accumulation rather than productivity growth, as measured by TFP;
- b. whereas labor accumulation has been on the rise, labor productivity—measured by output per worker—has been steadily declining. As among its regional competitors, Pakistani labor is also the least productive and the gap has increased in the last two decades (Planning Commission, 2011);
- c. the contribution of capital to labor productivity growth has become decreasingly important—almost nil in the 2000s—thus making capital accumulation an important driver behind growth in the eighties. However, its weight has significantly decreased in the 2000s⁵ as a consequence of diminished public investment—which halved from 10 percent of GDP in the early 1980s to 5 percent of GDP in the mid-2000s—and private investment improving only from 8 percent of GDP to 10 percent of GDP over the same period; only to see a recent revival since 2005 led by the private telecommunication sector and general government investment;
- d. TFP contribution has also been relevant, but dramatically declining to about one fourth of its 1980s level in the 2000s, reaching an average value of 1.4 for the

⁴ For most recent work, see World Bank (2006), Favaro and Koehler-Geib (2010) and Planning Commission (2011).

⁵ This decrease also corresponds to the significant fall in the investment-to-GDP ratio from a peak 31.3 percent of GDP in the sixties to a bottom 18.4 percent of GDP in the 2000s (Table 2).

- whole period, i.e. a contribution of about one-third of GDP growth, still below medium-term average of 2.0 in East Asia (World Bank 2006, 2010; IMF 2004);
- e. the contribution of human capital (using schooling as a proxy) was significant in the 80s, almost nil in the 90s, but rose again in the 2000s.⁶ Hausmann (2009) indicates that as labor supply is fast growing and the country still has a very low enrollment in primary education rate, it appears to evolve toward an economy intensive in unskilled labor, which obviously limits its potential for raising its labor productivity;
 - f. land contribution to labor productivity has been persistently negative—and close to nil.

15. What makes TFP productivity slow down? Multiple responses have been advanced. Khan (2006) finds that TFP growth in Pakistan is associated with macroeconomic stability, foreign direct investment and the financial sector. World Bank (2006) indicates that TFP growth was particularly strong in periods where the macroeconomic environment improved and political stability ensued. Mahmood and Siddiqui (2000) point to TFP growth's close correlation with low levels of science and technology. All in all, and not surprisingly, the Framework for Economic Growth concludes that the most crucial problem for Pakistan's growth challenge is its abysmally low productivity (Planning Commission 2011).

Table 2 Pakistan Sources of Annual Growth in Labor Productivity, FY81-FY11

Average Annual Percentage Rate of Change									
	Period	Real Output Growth	Investment as % of GDP (constant prices 2000)	Employment Growth	Output Per Worker Growth	Output per worker: % Contribution of			
						Physical Capital	Human Capital	Arable Land	TFP
Total Economy	FY81-FY90	6.1	18.18	1.8	4.3	1.2	0.9	-0.2	2.4
	FY91-FY00	4.4	18.79	2.4	1.9	0.8	-0.2	-0.3	1.5
	FY01-FY10	4.8	16.56	3.8	0.9	0.1	0.6	-0.4	0.6
	FY81-FY11	5.0	17.69	2.7	2.2	0.7	0.4	-0.3	1.4
Agriculture	FY81-FY90	4.0	1.95	1.8	2.2	1.4	0.4	-0.7	1.2
	FY91-FY00	4.4	2.11	1.6	2.8	1.0	-0.1	-0.6	2.4
	FY01-FY10	2.7	1.64	3.2	-0.5	0.0	0.1	-1.8	1.2
	FY81-FY11	3.6	1.88	2.3	1.3	0.8	0.1	-1.1	1.5
Industry	FY81-FY90	7.7	5.77	2.0	5.6	1.7	0.7	0.0	3.1
	FY91-FY00	4.2	6.87	1.0	3.2	2.7	-0.1	0.0	0.6
	FY01-FY10	6.1	5.26	5.0	1.0	-0.9	0.5	0.0	1.5
	FY81-FY11	5.8	5.87	2.7	3.0	1.0	0.3	0.0	1.6
Services	FY81-FY90	6.6	10.47	2.8	3.7	0.6	1.2	0.0	1.8
	FY91-FY00	4.5	9.81	3.7	0.8	0.2	-0.3	0.0	0.8
	FY01-FY10	5.1	9.66	4.1	1.0	0.2	0.7	0.0	0.1
	FY81-FY11	5.4	9.94	3.5	1.8	0.3	0.5	0.0	0.9

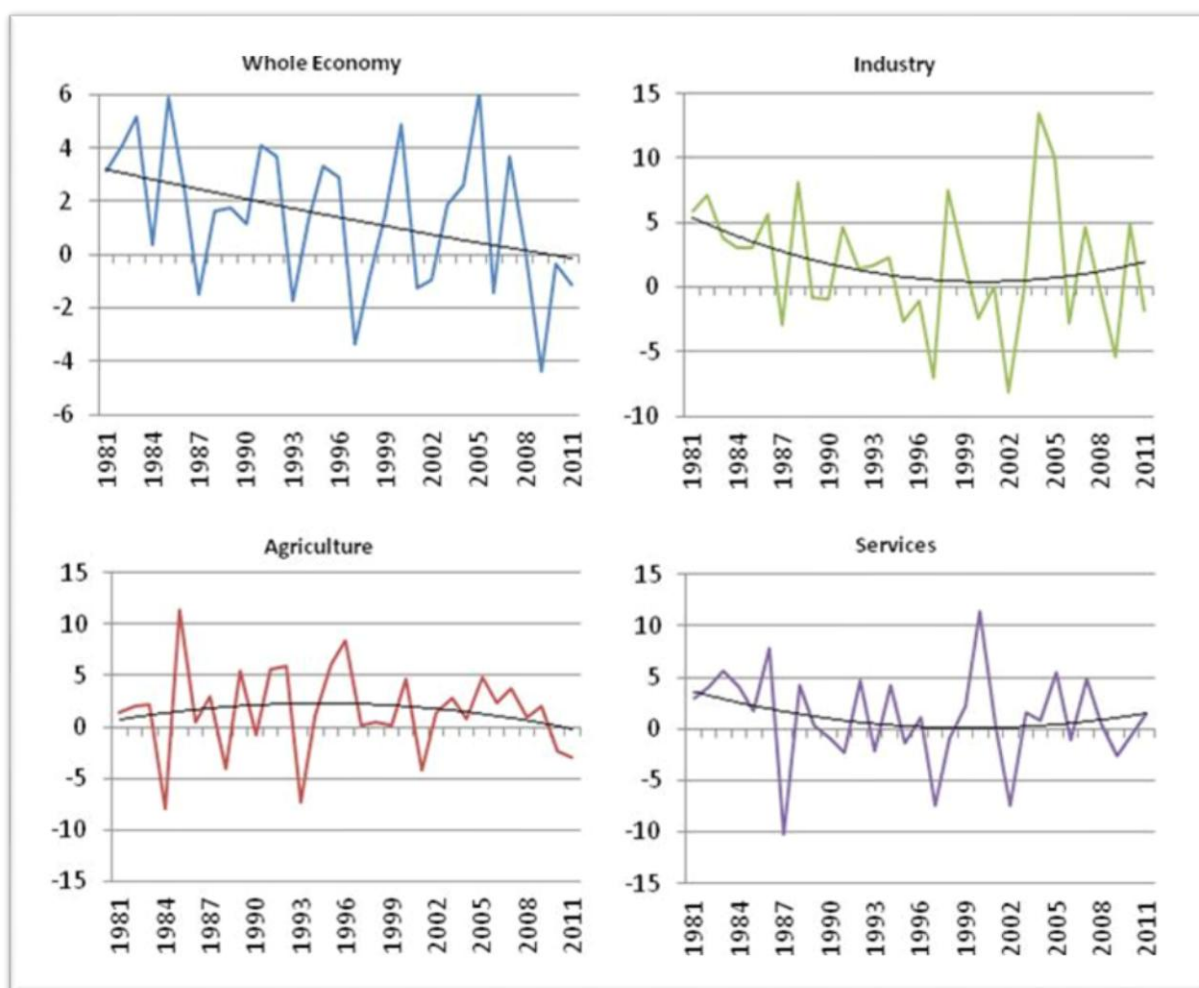
Source: World Bank staff

⁶ Human capital in Pakistan has always been low. Educational enrollment at all levels is below its regional peers (21%, 14 % and 6% in primary, secondary and tertiary respectively), and the country invests 42 percent lower in health spending per capita. Two political economy reasons behind low human capital in Pakistan are elite domination and ethnic factionalism. Landed aristocracy does not see the merits of taxing itself to pay for mass education. High ethnic factionalism is found to be associated with poor institutions, bloated bureaucracy and under-provision of public goods (Easterly 2003).

Sectoral Results

16. An analysis of inter- and intra-sectoral results show that GDP growth in Pakistan decelerated from 6.1 percent in 1980s to 4.4 percent in the 1990s, before mildly recovering to 4.8 percent in the 2000s. This was partly due to a sharp decline in labor productivity from 4.3 percent in 1980s to 1.9 percent in 1990s and to an anemic 0.9 percent in the 2000s. In addition, this deceleration was accompanied by steady decline in investment (as a ratio to GDP) and rates of all factors accumulation across the board. Decline in average TFP was dramatic, falling to about a quarter of its value of 2.4 percent in 1980s, even though TFP rates show some recovery at the end of the decade (Figure 5).

Figure 5 Growth in TFP in Output per Worker



17. In the 1980s, the economy enjoyed healthy performance, primarily due to physical capital accumulation and TFP contribution. The industry and services sectors were more dynamic with strong growth rates of 7.7 percent and 6.6 percent respectively (5.6 and 3.7 percent in output per worker respectively), while agriculture achieved a respectable 4 percent growth. Contribution of physical capital-to-output per worker was particularly substantial in the industry and agriculture sectors. The latter sector still enjoyed the benefits of the green revolution technology of improved seeds, irrigation and increased fertilizer use that spurred rapid growth initially in crop agriculture (especially wheat and rice), and later in the rapid

development of livestock production in the late 1970s (Dorosh, Niazi and Nazli 2003). The contribution of human capital was significant in the services sector (1.2 percent). Similarly, contribution of TFP was strong in industry (3.1 percent) and services (1.8 percent). It is worth noticing that the investment-to-GDP ratio in services averaged double digits at 10.5 percent in this decade.

18. All sectors also benefited from several positive macro factors. The lost growth momentum of the 1970s⁷ was partly recovered in the 1980s⁸ by a shift from both the policies of state ownership and control, the benefits of large investments made by the public sector in the 1970s, and a general environment of price stability and external inflows. Among large public investment projects, the most significant ones were the Tarbela Dam that considerably increased irrigation water availability, the hydel power project, and others in the fertilizer and cement sectors. Overall, an investment-to-GDP ratio averaging 18 percent and inflation rates averaging 7 percent were critical in stimulating growth and employment, which averaged 6 percent and 1.8 percent respectively. External inflows, such as workers' remittances and increased foreign assistance due to Pakistan's role in Afghan war, were also critical catalysts. TFP growth was strong in all three sectors—with a high 3.1 percent for industry—which is consistent with literature, showing that high TFP growth is normally associated with high investment and low inflation. The contribution of education was also significant—especially in services—due to the sharp rise in educational attainment and completion of secondary education. Between 1985 and 1990, the percentage of people above 15 years who had completed secondary education quadrupled from 3.9 percent to 16.5 percent. The contribution of land was negative (as it was in all three decades), as there was hardly any growth in availability of arable land. Though arable area remained stagnant, the number of workers per unit of land increased substantially over the period—in part also due to inheritance over generations—which would also lead to declining productivity in the 1990s.

19. In the 1990s, most factors that had contributed to positive growth in the previous decade reversed, while structural gaps inherited also affected macroeconomic performance. Declining quality of services and education, underperforming and loss making nationalized industries, power shortages, and macroeconomic imbalances—large fiscal deficits and a rapid buildup of public debt—plagued the economy and left unresolved issues for economic management. Interestingly enough, the decline in TFP is puzzling as it coincides with the liberalization of the economy. By mid to late 1990s, the Government undertook a large privatization program and major investments were undertaken in telecom, roads and power infrastructure. In other countries such as India, such types of liberalization had resulted in substantial growth in TFP (Bosworth, Collins and Virmani 2007), but this was not the case of Pakistan. Why? One reason could be that these reforms were fragmented, badly sequenced or truncated in the late 2000s. Another possible explanation is by McMillan and Rodrik (2011), who assert that the difference between Asia's recent growth, on the one hand, and Latin America's and Africa's, on the other, can be explained by the variation in the contribution of structural change to overall labor productivity. Hence, one of the most

⁷ The decade of the 1970s featured several shocks; East Pakistan became Bangladesh in 1971 after a civil war. There were severe floods and political unrest. There was a paradigm shift in country's economic model. Pakistan People Party nationalized all the major manufacturing industries, banking, insurance, education etc. which resulted in major disruption and loss of investor confidence. This experiment had negative impact on private sector growth, manufacturing and quality of education.

⁸ The political regime of the 1980s abandoned further nationalization as state policy. However, it did not reverse the prior nationalizations.

striking findings is that in many Latin American and Sub-Saharan African countries, broad patterns of structural change served to reduce rather than increase economic growth since 1990. And this was so because macroeconomics sustainability remained a serious concern throughout the decade, and political uncertainty⁹ contributed significantly to the fluctuations in economic growth. There was also a question of sequencing of reforms. For instance, financial sector reforms in 1990s were implemented before substantial reforms on the fiscal side. As a result, during the 1990s government finances were under stress due to higher borrowing cost emanating from financial liberalization. This was compounded by macroeconomic instability toward the end of the 1990s due to international sanctions imposed on Pakistan after a nuclear detonation. Overall, lower growth in the 1990s, rather than reflecting trade liberalization, indicates the changing nature of domestic politics; the vagaries of external assistance and the inability of policymakers to implement and, especially, sustain reforms. To compound matters, foreign inflows which remained a substantial source of financing during 1980s, dried up in the 1990s due to the loss of interest of donors in the region, as the Afghan war ended with the USSR pulling out.

20. Where the contribution of physical capital continued to benefit the industry sector, all sectors, except agriculture, showed a marked decline in the contribution of TFP to labor productivity. Despite large investments, the industrial activity grew moderately as there was considerable inherited unutilized capacity available in the industry—especially in later half of 1990s. For its part, the agriculture sector grew on average at 4.4 percent during the decade. Rather than as a result of substantial growth of 1.6 percent in employment, it was the outcome of rising labor productivity at 2.8 percent, with a major contribution from TFP. For its part, the services sector continued to experience strong employment growth of 3.7 percent, but its output per worker and TFP grew by only 0.8 percent. Contribution of human capital was negative across all sectors which is difficult to interpret. One reason might be that education attainment achieved in the second half of 1980s was not maintained in 1990s.

21. In the 2000s, although economy grew on average by about 4.8 percent during 2000s, TFP contribution significantly declined across all sectors.¹⁰ Pakistan went through a stabilization program in early part of 2000s to attain macroeconomic stability and inflation was brought down to around 3 percent by mid-2000s. Post September 11, 2001, the economic sanction imposed after nuclear detonation was eased, which allowed significant foreign inflows and external debt rescheduling, thus creating a sense of stability on the external front. On the domestic front, substantial excess capacity available in industrial and power sector propelled growth acceleration in the mid 2000s, with a peak 8.9 percent rate in 2004-05. Muslehuddin (2007) compares the two periods of growth acceleration (1983-84 to 1987-88 and 2002-03 to 2005-06) and finds that these were driven by an improved policy stance and a favorable external environment. But the latest spurt took place under healthier macroeconomic fundamentals, structural reforms, institutions, governance and private sector dynamism. Ensuing growth in employment during 2000s happened across all three sectors. However, sector disaggregation of employment finds that growth in Pakistan was not accompanied by the type of structural transformation which transfers labor from low productive sectors to high productivity sectors. In Pakistan, although employment in Agriculture grew by strong 3.2 percent labor productivity contracted by 0.5 percent. In

⁹ There were four elections, two caretaker governments and a military coup in 1999.

¹⁰ However, the outcome is not as bad if we confine our analysis to the period before the political and balance of payment crisis (2002-03 to 2007-08). During this period, contribution of TFP growth in output per worker was substantial at 1.3 percent.

contrast, for China, during the period 1993-2004, agriculture sector employment declined by 0.6 percent while productivity per worker grew strongly by 4.3 percent (Bosworth and Collins 2007).

22. The sectoral break up also shows a mixed performance in 2000s. The investments made in the 1990s in the infrastructure sector achieved full capacity in the 2000s, which allowed industry to achieve 6.1 percent growth in the sector. However, the average investment-to-GDP ratio of 17 percent in economy (and barely 5 percent in industry) was lowest in three decades. Therefore, the contribution of capital-to-output per worker was particularly negative at 0.9 percent in industry during the 2000s, especially in the power sectors. The services sector also grew strongly at 5.1 percent during the decade, but despite a 4.1 percent growth in sectoral employment, growth in both labor productivity and TFP were anemic at 1.0 percent and 0.1 percent respectively.¹¹ This shows again that services sector growth was mainly the result of labor accumulation. Again, this is in contrast to India and China, where during 1993-2004, employment growth in services was accompanied by strong growth in output per worker from preceding periods (Bosworth and Collins 2007). Contribution of human capital was positive across all sectors. Services sector which is labor and skill intensive was its largest beneficiary with a contribution of 0.7 percent from human capital to output per worker.

Conclusions

22. Pakistan growth spurts have become scarce and growth patterns exhibit a decreasing trend. As the economy has a very low domestic saving rate (as percentage to GDP), Pakistan has remained dependent on foreign saving inflows to sustain its investments. Periods of positive growth performance have been better because foreign inflows were accessible and macroeconomic and political stability sustained policy regimes.

23. Compared to East Asian countries, Pakistan lags in all factors of accumulation. Not only investment rates are low and decreasing, but Pakistan falls behind in human capital formation and TFP growth. Low investment rates are compounded by neglected human capital. Contemporary growth theory also stresses the importance of human capital and quality of policies implemented by governments. According to UNESCO estimates, 30 percent of Pakistanis live in extreme educational poverty—having received less than two years of education. And as mentioned in the Framework for Economic Growth (Planning Commission 2011) “One in ten of the world’s primary-age children who are out of school live in Pakistan. This makes the country second in the global ranking of out-of-school children. This richest 20 per cent of Pakistanis receive almost 7 years of more education than the poorest. Less than half of women have ever attended school.”

24. TFP growth can barely improve unless Pakistan’s record of structural reform improves. Reform is fragmented and littered with a myriad of policy reversals. This perhaps is the reason that in Pakistan’s case, structural reform has not yielded results when compared to other countries. In other countries such as India, liberalization had resulted in substantial growth in TFP (Bosworth, Collins and Virmani 2007). Economic policies should aim to harness private sector growth through level playing field, creating institution, incentives, markets to support innovation and better use of available resources.

¹¹ For truncated period (2000-01 to 2007-08), contribution of TFP in output per worker was about 0.5 percent.

Annex 1. Measuring Growth in Total Factor Productivity

The output of an economy is a function of its endowments (labor, physical capital, human capital, land) and the productivity with which these endowments are used to produce a flow of goods and services (GDP). In our framework, the growth of per-capita output can, in turn, be expressed in terms of four determinants (a) physical capital deepening (b) human capital accumulation and (c) contribution of arable land and (d) TFP growth. Gains in TFP, reflecting more efficient use of inputs, have long been recognized as an important source of improvements in income and welfare. Cross-country differences in income levels and growth rates are mostly due to differences in productivity (Easterly and Levine, 2001). Measuring TFP is therefore important in assessing a country’s past and potential economic performance.

We assume constant returns-to-scale Cobb-Douglas production function to analyze the factor contribution and TFP in per worker output growth:

$$Q = A K^\alpha Z^\beta (LH)^{(1-\alpha-\beta)} \dots\dots\dots (1)$$

Where Q, A, K, and Z are real GDP, TFP, physical capital stock and arable land area respectively. The production function also depends on human-capital-adjusted labor input (LH) where L is labor force and H is human capital. One way to measure human capital is to adjust the number of workers for their average years of schooling (S) by assuming that each additional year raises workers’ productivity by a given percentage. Various estimates suggest that, defined in this way, the returns to education are between 5 to 10 percent. Following Bosworth and Collins (2007), we assume that every additional year of schooling raises the labor productivity by 7 percent.

$$H = 1.07^S$$

α and β in (1) are factor shares and measures of importance of physical capital and arable land in output. The factor shares are assumed in following table as they are not directly observable.

Factor shares in		Agriculture	Industry	Services
Capital	α	0.25	0.55	0.20
Arable Land	β	0.50	0.00	0.00
Labor	$1-\alpha-\beta$	0.25	0.60	0.80

We divide all variables in (1) by Labor (L) and take a log. Resulting growth in real GDP per worker (q/l) is decomposed in any sector as the sum of contributions of growth in capital per worker (k/l), growth in land per worker (z/l), increases in education per worker (h) and the contribution of improvements in TFP (a):

$$\frac{q}{l} = \alpha \left(\frac{k}{l}\right) + \beta \left(\frac{z}{l}\right) + (1 - \alpha - \beta)h + a \dots\dots\dots (2)$$

With the model parameters unchanged over the entire period by assumption, difference in aggregate growth between the periods is driven by underlying differences in factor accumulations and sectoral shifts. Srinivasan (2005) points out that all TFP growth

estimates without exception are highly sensitive to the data used, parameter assumption, and above all to the methodology of estimation. For example, different authors use different real GDP growth data—some using constant domestic price-based values and others who use purchasing power parity-based data. Also strong maintained assumptions are made in the empirical analysis about production functions and the statistical properties of the disturbance terms that are essential components of the model used for estimation. Errors of measurement can also lead to substantial errors in the estimated residual. The informal sector economic activity that is quite significant has not been fully accounted for and can cause measurement error. As discussed in World Bank (2000), the interpretation of measured TFP growth can also be problematic when growth reflects factors other than purely technical change—such as increasing returns to scale, markups due to imperfect competition or gains from sectoral reallocations. In one sense, due to these unknown factors, TFP is some time called “the measure of our ignorance” (Hausmann, Klinger and Wagner 2008).

Data are taken from number of sources for the period of 1980-81 to 2010-11. All data are constructed in per worker terms. For Real GDP data and sectoral shares we have used various issues of Economic Surveys. Data on arable land area over time is taken from FAO statistis. Total and sectoral employment data is collected from ILO database. In the database, educational attainment before 2001 is gathered from surveys conducted every five years and the intermediate years are interpolated. Sector-wise educational attainment is available only from 2003 onwards and for the preceding years the trend in aggregate years of schooling is applied to the 2003 estimates. Upon closer scrutiny, the sharp rise in educational attainment and completion is concentrated at the secondary stage between 1985 and 1990. The percentage of people above 15 years who have completed secondary level education quadrupled from 3.9 percent in 1985 to 16.5 percent in 1990. Though there may be data quality issues, indirect evidence from the censuses of 1981 and 1988 showed a surge in overall literacy from 26.2 to 43.9 percent. A ten-fold increase in number of private schools even in rural areas between 1983 and 2000 was a significant factor though the expansion seems to be concentrated in primary and middle school levels (Andrabi, Das and Khwaja 2002).

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