

**Is the Economy of Bangladesh Actually expanding?
An Analysis Using the Hayashi, Kehoe and Prescott Approach of
Growth Accounting, and Other Related Factors**

By

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the School of Humanities and Social Sciences of Brac University in
partial fulfillment of the requirements for the degree of
Master of Science in Applied Economics

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Declaration

It is hereby declared that:

1. The thesis that is submitted is my own original work, made to complete a degree at BRAC University.
2. This thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. This thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at any other university or institution.
4. I have acknowledged all main sources of help in writing this thesis.

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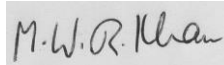
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Approval

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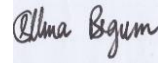
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Ethics Statement

I declare that there is no conflict of interest related to this thesis.

Abstract

This paper is about inconsistencies between two scenarios of Bangladesh. On one hand Bangladesh is recognized as the top rich growing country, and on the other hand old women cry out of hunger or attempt suicide for being unable to feed their children. In this paper I'll try to figure out the facts and causes that are responsible for such an inconsistency. This paper is also a study about the changes of growth that have happened until now in Bangladesh and about an answer to the question of what growth really means. I have also tried to figure out the condition of three countries (Bangladesh, India, and Pakistan), which were united until the separation of 1947 and became three independent nations in 1971. This study will not analyze political problems but will try to show the current economic situation of these countries. I will try to find out which changes are required for country development. The main approach used here is the growth accounting model proposed by Hayashi, Kehoe and Prescott.

Keywords: Growth accounting, Hayashi, Kehoe and Prescott approach, country analysis, other factors (Multi-dimensional Poverty Index, Fragile State Index, etc.)

Dedication

This paper is dedicated to my parents.

Acknowledgement

First of all, I would like to express my gratitude to the almighty Allah for enabling me to complete this thesis. I would like to express my endless gratefulness to my respectful thesis supervisor, Dr. Wasiqur Rahman Khan, Professor, BRAC University, for approving my thesis topic and essential supervision. His continuous encouragement, important suggestions and necessary corrections helped me to complete this work successfully. Special thanks to Dr. A.M. Tanvir Hussain, Associate Professor of East West University, Department of economics for his immense contribution during my defense of this thesis work. I would like to express my complement to my family members for their inspiration and moral support throughout the project.

Table of Contents

Declarationi

Approvaliii

Ethics Statementiv

Abstract/ Executive Summaryv

Dedication (Optional) vi

Acknowledgementvii

Table of Contentsviii

List of Tablesviii

List of Figuresix

List of Acronymsx

Chapter 1 : Introduction1

Chapter 2 :Literature Review3

Chapter 3 :Methodology and Data collection 4

Chapter 4: Result and Discussion5

 4.1: Growth Accounting 5

 4.2: Result and Discussion.....10

 4.3: Other Factors.....18

Chapter 5: Conclusion.....29

References30

Appendices31

Appendix 1.....31

Appendix 2.....40

List of Tables

Table:1 Category Wise FSI Score.....25

List of Figures

Figure 1: Trend of GDP per capita in Bangladesh.....7

Figure 2: Growth rate of GDP and Population.....7

Figure3: GDP growth (annual %) data of Bangladesh, Pakistan and India.....8

Figure 4: Growth Accounting in Bangladesh (a) (b) (c).....12

Figure 5: Growth Accounting in India (a) (b) (c).....14

Figure 6: Growth Accounting in Pakistan (a) (b) (c).....16

Figure: 7 TFP of Bangladesh, India and Pakistan.....17

Figure: 8 Innovation Index of Bangladesh.....18

Figure: 9 Internet user (% population) in Bangladesh.....19

Figure: 10 Industrial Production (annual % change).....20

Figure: 11 Trade openness (% GDP) in Bangladesh.....21

Figure 12: Cost of starting business(% GNI) in Bangladesh.....22

Figure: 13 Gini Inequality Index of Bangladesh.....23

Figure: 14 Bangladesh Poverty Ratio.....25

Figure:15 Bangladesh Fragile State Index.....26

List of Acronyms

GDP	Gross Domestic Product
GNI	Gross National Income
TFP	Total Factor Productivity
FSI	Fragile State Index

Chapter 1

Introduction:

A nation who made it happened their own growth history to be plotted separately, Bangladesh, achieved their separate political, social and economic right in 1971. Bangladesh was a major source of resources for West Pakistan back then. After the liberation war to till now a massive change happened in the economy. What make it boom so high, what are the causes and consequences behind this growth and what errors are still present with the expansion; I will try to find out it through my paper. Before 1947 Pakistan, India and Bangladesh was one nation. In 1947 Pakistan and India got separate identity and in 1971 East Pakistan and West Pakistan got separated and a fully new nation, Bangladesh had emerged. East Pakistan became Pakistan. So from one nation to three separate nations, how these three countries have changed economically, what their current state of economic growths are, in my paper I'll show a comparison.

As I mentioned before, among errors in the pathway of an expanded economy are poverty and unemployment. Other things may be included, but I find it as major problem for Bangladesh. In my paper I'll also show how and in what context poverty and unemployment affect economic growth. I will also show some policy implication for that.

To understand the growth scheme, I have used Growth Accounting concept. Growth accounting shows why the changes in real gross domestic product (real GDP) happens. It shows whether the changes of growth occur due to labor change, capital change or for technological expansion. The measure of economic productivity growth is referred as TFP which is Total Factor Productivity. I have used Hayashi, Kehoe and Prescott approach to calculate Growth accounting. I'll try to show in my study the source of growth using Growth accounting exercise. I have used Hayashi, Kehoe and Prescott approach because this is the most recent one whereas Solow approach is quite an older one. In my paper I haven't chosen the very popular traditional growth accounting approach to reach the desired result because Kehoe and

Prescott approach is the upgraded version of Solow approach of growth accounting. I have compared only among three countries in South Asia because of some important reasons. First of all this three countries were one in the very root level. Now they are three independent nation. Pakistan had in semiindustrial phase of economy when it got separated 1947 from India. The semi-industrialized economy of Pakistan was heavily Textile and Food Production based. On the other hand after 200 years of British ruling there emerged a newly born sovereign independent nation, India; with a shuttered economy, inconsiderable rate of literacy and awe-inspiring poverty. In 1971 another new independent nation emerged, which had a heavily import-based economy. In Henry Kissinger's dismissive term Bangladesh was the original "basket case". From the economic situation of these countries I'll try to figure out the current state of their economic growth.

Chapter 2

Literature Review:

Growth accounting is the measurement of the sources of growth. Angue C. Chu and Guido Cozzi (2016) in their paper growth accounting and endogenous technical change analyses the two conventional approaches to growth accounting under endogenous technical change. The two conventional approaches are Solow model (1957), Hayashi, Prescott (2002) Kehoe ,Prescott (2002) approach of growth accounting. In their paper they discussed and examines that the traditional slow approach is lab-equipment specialization for technological progress and the latter is knowledge driven specification. In this paper, the study adopted the Hayashi, Prescott (2002) and Kehoe Prescott (2002) approach to see the sources of growth in three countries. This approach is used basically for constructing the capital (K) series.

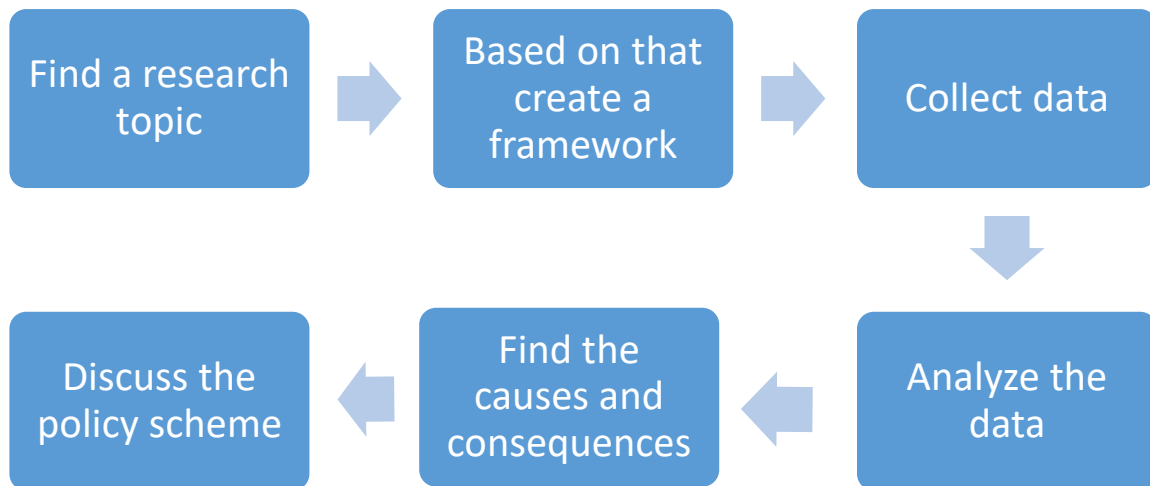
Using this approach this paper shows the sources of growth in Bangladesh, Pakistan and India.

Charles I Jones (2015) in his paper “The facts of Economic Growth” has shown the facts and consequences of inequalities, economic growth of the world. It also shows some comparison in past situation of the world economy and the present status of the world. This paper also shows why some countries are poor and why some are rich. In this paper the study shows what factors stimulates growth and what factors are the main obstacles to rich in a better economy. My study also brings some factors into limelight that are very important to understand the overall situation of Bangladesh for example Fragile State Index, Cost of starting business, Innovation Index, Trade Openness etc. This study also shows which districts are poverty-prone and which districts are in a better state to understand inequality or imbalances. This study follows Kehoe, Prescott (2002) and Hayashi, Prescott (2002) approach to show the three countries’ sources of growth and give a demographic explanation to where growth happens despite all obstacles.

Chapter 3

Methodology and Data collection:

Methodology:



For doing this study I had to select a research topic which is about the growth accounting. Then I had to collect data for this research. Make necessary calculations and find the required result.

Then according to that result I had to suggest some policy scheme.

Data collection:

All the data are collected from World Development Indicator. The necessary data are:

- 1) Gross Domestic Product (Y)
- 2) Gross Capital Formation(which is our investment) (I)
- 3) Total Number of population (15 to 64 years) (N)
- 4) Total number of employed person (15 to 64 years) (L)
- 5) Employment to population ratio, 15+, total (%) (modeled ILO estimate) for calculating the total number of employed person (15 to 64 years). (E)

The data are used for calculating capital which is our K in this study.

Using this data we shall find out K/Y , Y/N , L/N and A. Here 'A' is the TFP.

Chapter 4

4.1 Growth accounting:

In this section we shall discuss about the two approaches of growth accounting. One is the very traditional growth accounting model brought forward by Solow in 1957. Another one is a more neoteric approach of growth accounting raised by Hayashi and Prescott in 2002 and Kehoe and Prescott in 2002. The traditional growth accounting model proposed by Solow sees the economic growth in the light of growth rates of factor inputs and technology. Enucleating these accounting relationships as the causal relationship which also need a fundamental assumption that inputs such as physical capital or labor are independent from technology. But in the long run an important result can be seen from seminal growth model which is the growth in output and capital is directed by technological progress. So illustrating the Solow approach of growth accounting relationship as an etiological relationship may overstate the contribution of capital accumulation and understate technological progress contribution to economic growth. Therefore Hayashi, Kehoe and Prescott approach alluded this issue. Their approach is to scale up the importance of technological progress and rather than the growth rate of capital stock, measuring the contribution of capital accumulation by growth rate of capital-output ratio.

Now for Solow approach starting with the Cobb-Douglas production function we can see that

$$Y = K^\alpha (AL)^{1-\alpha}; \alpha \in (0,1)$$

Where:

Y denotes output

A denotes technology

K denotes physical capital and

L denotes effective labor, which includes human capital and raw labor

α is the parameter determines intensity of capital in the process of production.

We use the growth accounting method developed by Kehoe and Prescott (2000, 2007). The model features an aggregate Cobb- Douglas production function:

$$Y_t = K_t^\alpha (A_t L_t)^{1-\alpha}$$

Rewrite the production function as :

$$Y_t/N_t = A_t^{1/(1-\alpha)} (K_t/Y_t)^{\alpha/(1-\alpha)} (L_t/N_t)$$

Where N_t is the working age population.

Balanced Growth path:

Along the balanced growth path, when A_t grows at a constant rate, the capital-output ratio K_t/Y_t and the participation rate L_t/N_t are constant.

Constructing the TFP series:

First we collect data for real investment, real GDP, working age population and employment. We construct the capital series using the perpetual inventory method.:

$$K_{t+1} = (1-\delta)K_t + X_t$$

Where δ is the depreciation rate. We get the initial capital stock using

$$\frac{KT0}{YT0} = \frac{1}{10} \sum_{t=T0+1}^{T0+10} \frac{Kt}{Yt}$$

From the spreadsheet calculation we construct a capital series:

The TFP is calculated as:

$$A_t = K_t^\alpha L_t^{1-\alpha} / Y_t$$

GDP per capita in Bangladesh:

From Appendix-1 I have plotted the following figure.

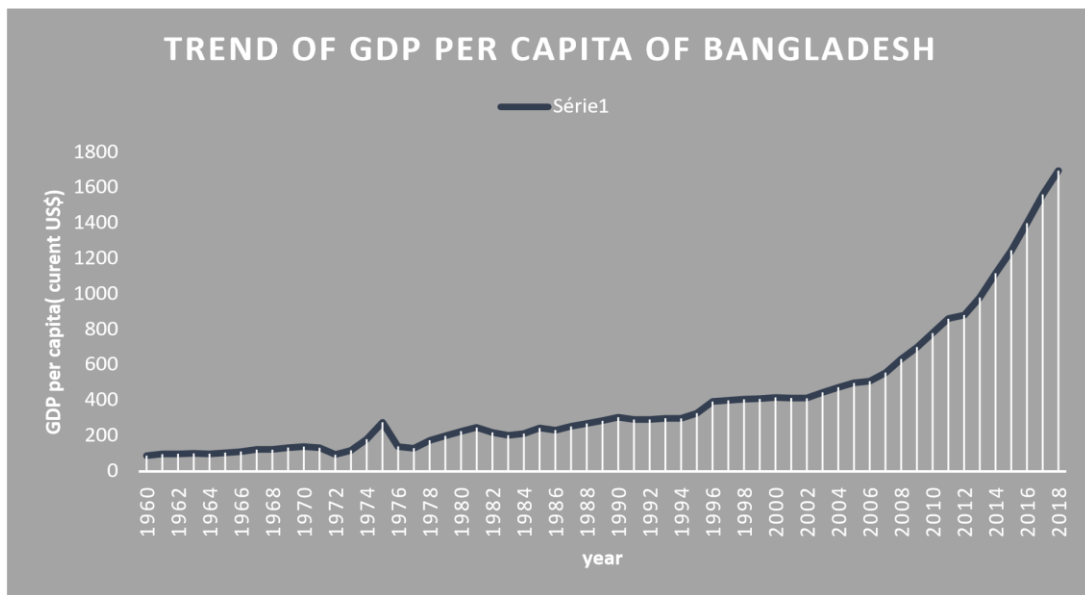


Figure 1: Trend of GDP per capita in Bangladesh

From the above figure we can see that GDP per capita did not increase enough before the liberation war. After the liberation war per capita income dropped. After that per capita GDP increased by little till 2005. After 2005 per capita GDP to 2010 per capita income trend line is little sharp. From 2011 to 2018 the GDP per capita increased so sharply. In 2018 GDP per capita is 1698.963(current US\$).

Population and GDP growth rate in Bangladesh:

From Appendix-2 I have plotted the following trend.

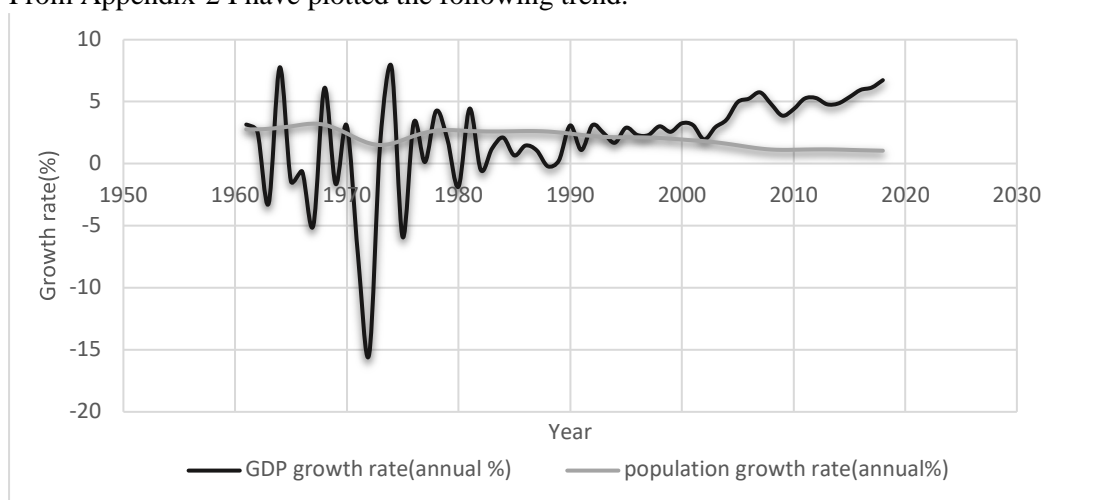


Figure 2: Growth rate of GDP and Population

From Figure 2 we have seen that GDP growth rate is very upward sloping and from 2013 to 2018 the growth rate is becoming higher and higher. We'll discuss about the growth rate later in detail in the discussion section of three countries' economic growth . If we see the population growth rate, we can see that the growth rate is steadily decreasing from 2013 to 2018.

Economic Growth rate comparison:

From Appendix-3 I have plotted GDP growth (annual %) of Bangladesh, Pakistan and India.

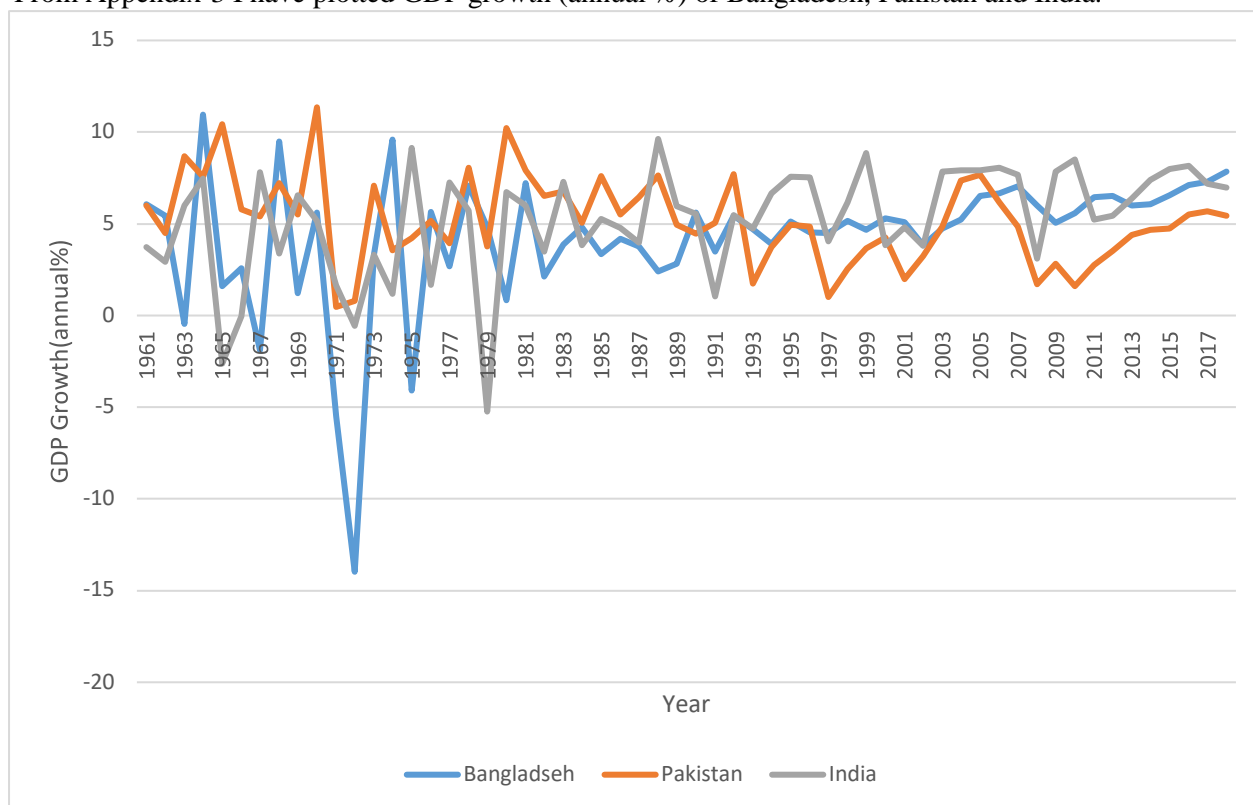


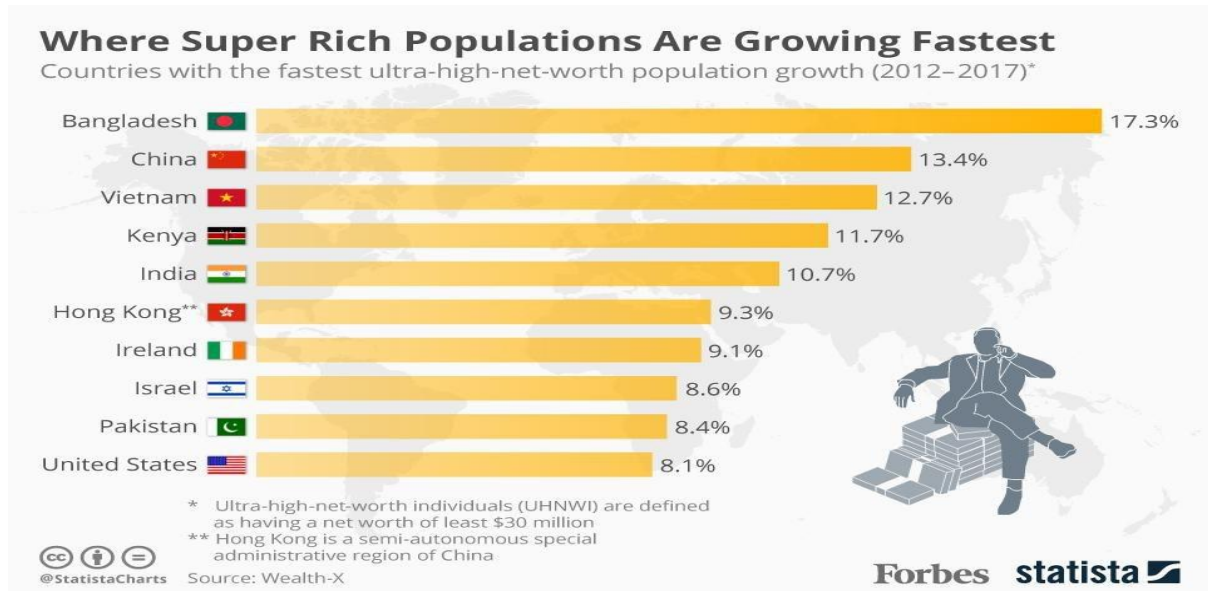
Figure 3: GDP growth (annual %) data of Bangladesh, Pakistan and India.

From figure 3 we can clearly see that the growth rate of Bangladesh had a massive fall of growth during 1971 to 1972. It was 5.62% in 1970 and in 1971 it fell directly in a negative direction -5.47% .Which fell into -13.97% in 1971. The growth rate did fall for the other county Pakistan and India too, but not as massive as Bangladesh did. In 1972 when Bangladesh experienced the lowest -13.97% growth, the growth rate for Pakistan and India had a growth rate of 0.813 and -0.5533% respectively. So if we compare this three country's growth rate in 1972 which was right after the liberation war we can see that

Pakistan had a higher growth rate than India and Bangladesh, India had a higher growth rate than Bangladesh. So if we rank them from higher growth rate to lower, then first Pakistan, then India and lastly Bangladesh. From then to till 2018 the three countries experienced many fluctuations in their growth rate curve. If we look at 2018, we can see that Bangladesh has a GDP growth rate of 7.86%, India 6.98% and Pakistan 5.43%. So ranking them by 2018 growth rate scenario, we can see that highest growth rate is in Bangladesh, then India, then Pakistan. So this is completely an opposite scenario from 1972. So what happened behind this economic boom? This is the purpose of the study.

Ultra-High Net-Worth (UHNW) population growth:

The people under UHNW scheme are those who have at least \$30 million of investable assets. These assets are usually excluding the property and personal assets. For example primary residence, consumer durables and collectibles. According to a new report from New York based research firm Wealth X, over the past five years, from 2012 to 2017 Bangladesh has registered the quickest- growing UNHW or ultra-wealth population of any country in the world.



The World Ultra Wealth Report 2018 shows that the UNHW individuals in Bangladesh rose by 17.3 percent. Bangladesh is ahead of China, Vietnam, Kenya, India, Hong Kong, Ireland, Israel, Pakistan and the US, in terms of growth. US has recorded the weakest growth in its ultra-wealthy population.

But it remained by far the egregious country for UHNW individuals in 2017, accounting for a 31 percent share. If we consider the three South Asian country we are concerned about, it can be seen that in terms of ultra-wealthy population growth Bangladesh is at the Top, India fifth and Pakistan ninth.

4.2 Result and discussion:

In this study I have divided result and discussion into three parts.

In First Part I have shown the growth accounting for Bangladesh, in second part I have done this for India and in the third part I have done this for Pakistan.

Before that I want to discuss about the procedure how I have done this.

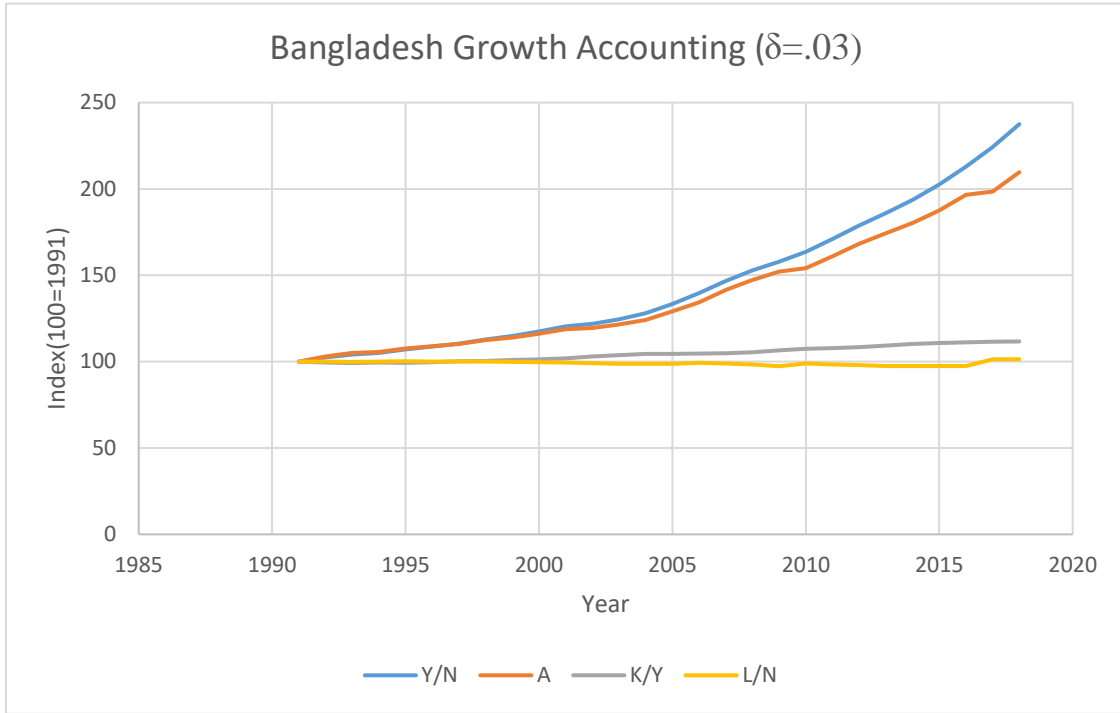
Calculation Process:

For doing this I have done a growth accounting calculation. For doing this we have done the calculation for the construction of capital (K). The data I have used here is Gross domestic product (GDP), Gross Capital formation, which is considered as the investment here, Number of population (15 to 64 years), Number of people employed.

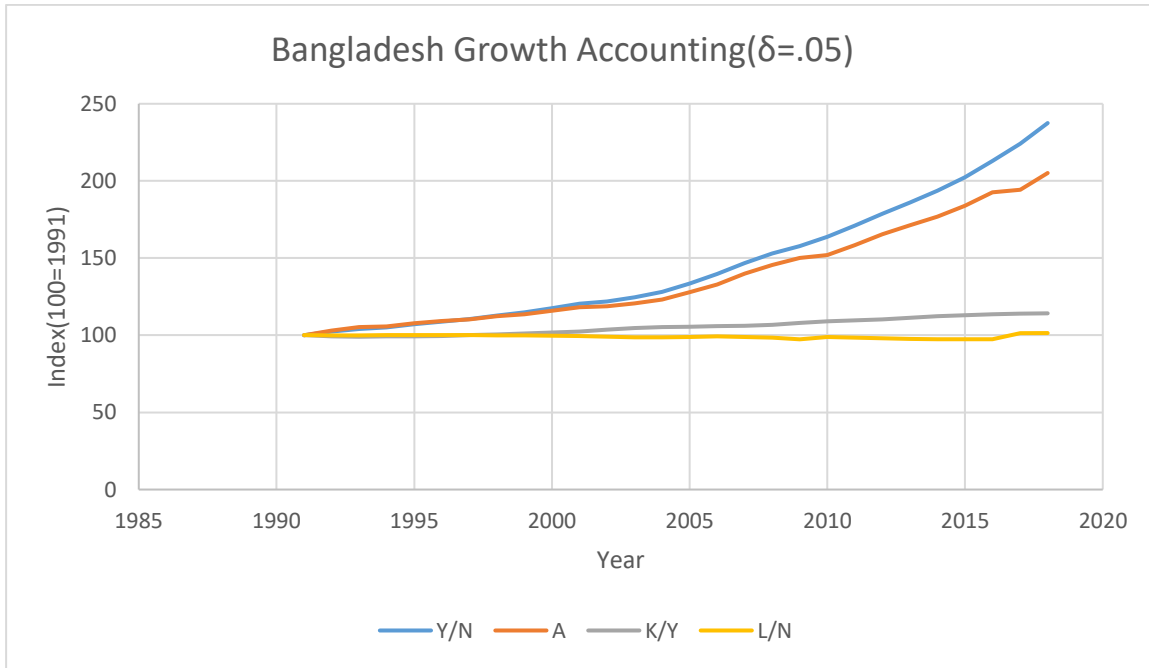
Here for calculating capital I have used depreciation rate for .03, .05 and .07 to see whether change in depreciation rate changes the trend line of TFP or not. But there was no significant change seen for the change in depreciation rate. I have used the standard value of α , which is .3 .After finding the GDP and number of working age population ratio(Y/N), capital output ratio(K/Y), Number of employed person and working age population ratio(L/N)(we find TFP which is 'A' in our exercise by $(Y/N)/(K/Y)/(L/N)$. For bringing this into the same plot we have indexed them keeping (1991=100). Then I have plotted the four lines and see the sources of growth for each country.

Growth Accounting (Bangladesh Scenario):

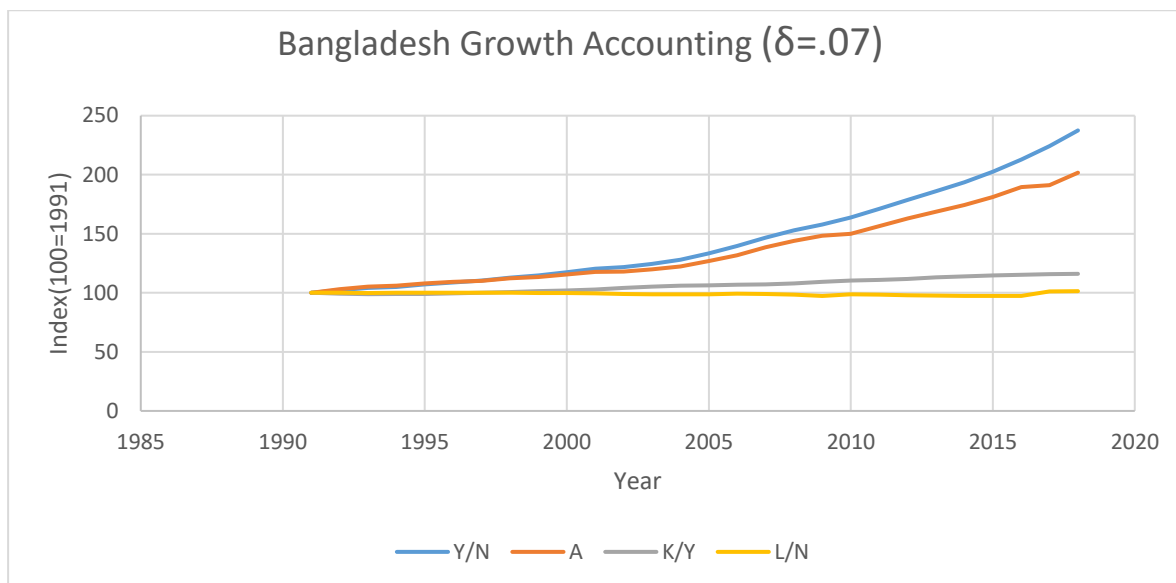
The data are given in the Appendix section. Having done the growth accounting exercise for Bangladesh. For depreciation rate .03, .05, .07 the scenarios are:



(a)



(b)



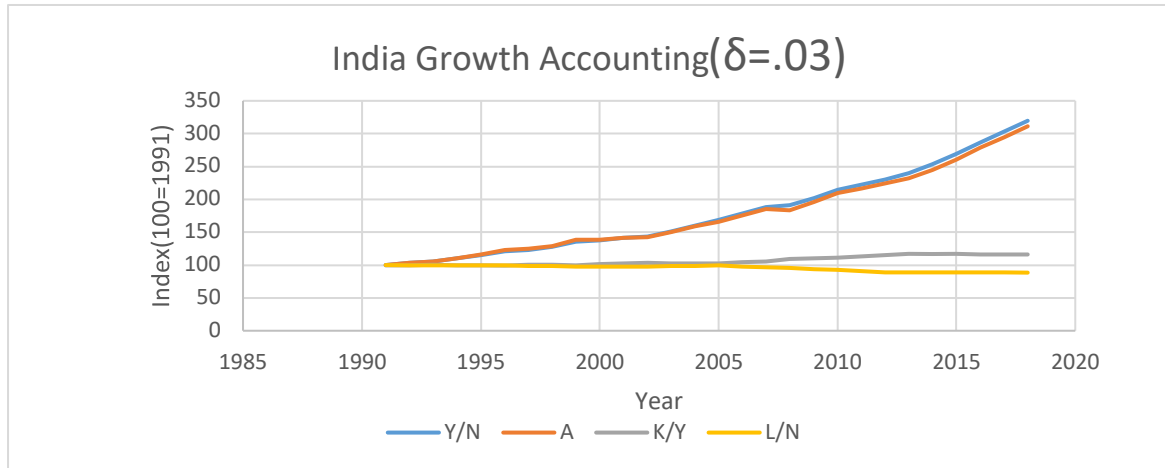
(c)

Figure 4: Growth Accounting in Bangladesh (a) (b) (c)

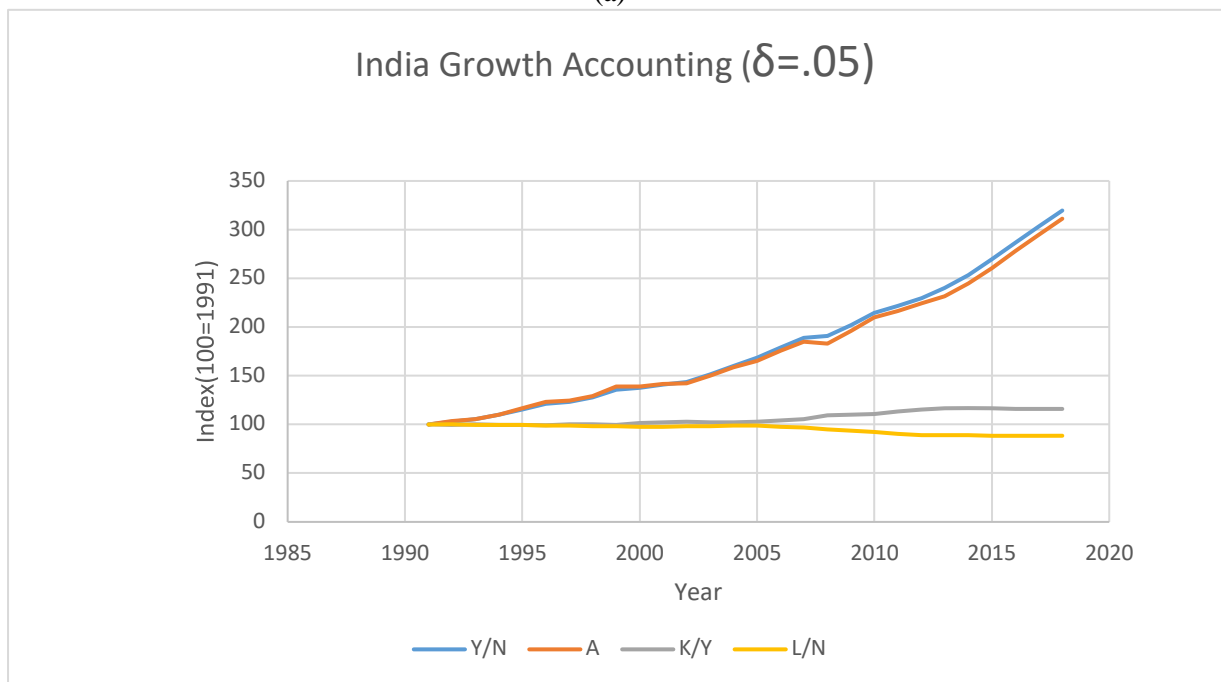
The following figure shows the sources of growth of economy for Bangladesh. The Blue line represents real GDP/Number of working age population(15 to 64 years) trend, the orange line represents the Total Factor Productivity, the Gray line represents the capital output ratio ,the yellow line represents the Number of population employed/ number of working age population(15 to 64 years) from 1991 to 2018. I have here taken three different depreciation rates for seeing if depreciation rate change cause any difference in the trend lines. Figure 4(a) represents the Growth accounting figure when depreciation rate is 3%, Figure 4(b) represents the Growth accounting figure when depreciation rate is 5%, Figure 4(a) represents the Growth accounting figure when depreciation rate is 7%. We can see that in case of Bangladesh real GDP and working age population ratio, then from technology, which is total factor productivity, the capital output ratio is much lower than TFP and employment and working age population ratio is much lower than K/Y. So the sources of Bangladesh's economic growth are coming mostly from Y/N and then from technology.

Growth Accounting (India Scenario):

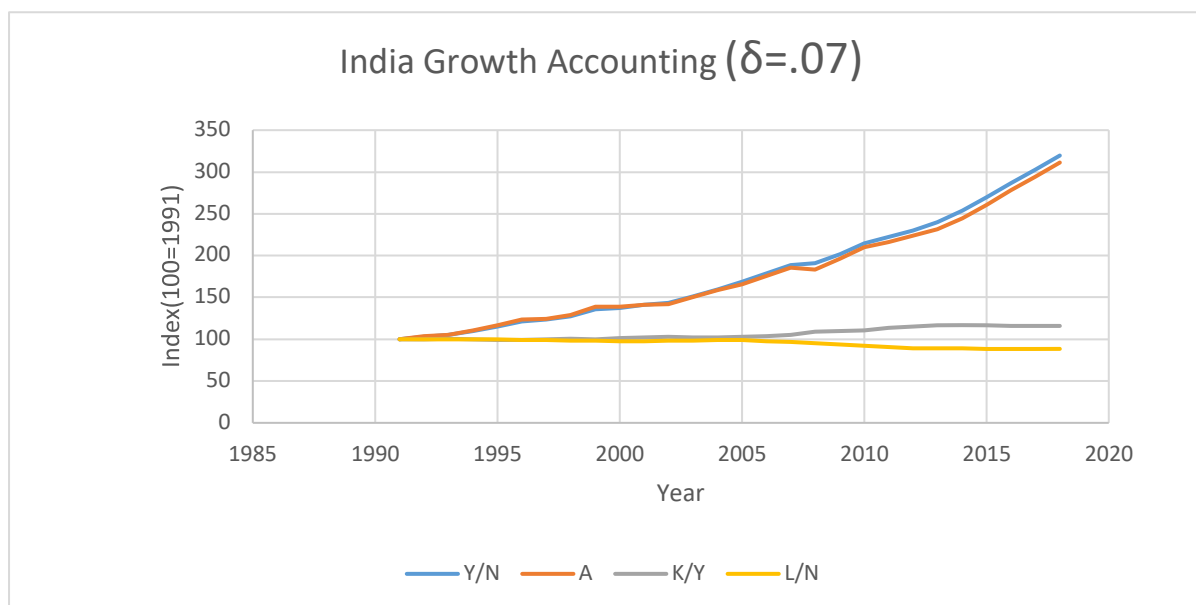
The data are given in the Appendix section. Having done the growth accounting exercise for India we can see the following three scenarios. For depreciation rate .03, .05, .07 the scenarios are:



(a)



(b)



(c)

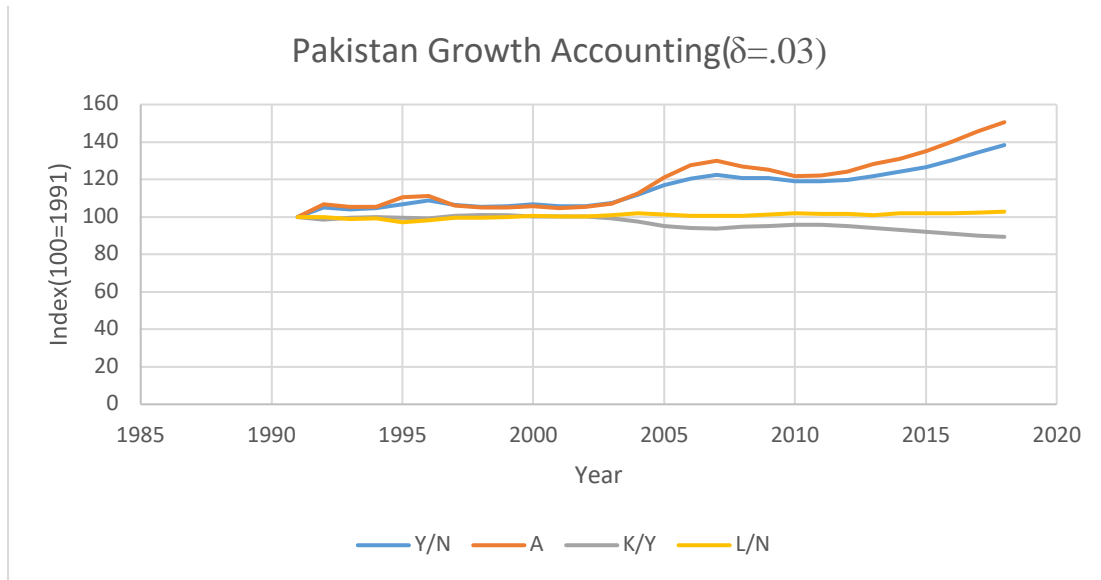
Figure 5: Growth Accounting in India (a) (b) (c)

The following figure shows the sources of growth of economy for India. The Blue line represents real GDP/Number of working age population(15 to 64 years) trend, the orange line represents the Total Factor Productivity, the Gray line represents the capital output ratio, the yellow line represents the Number of population employed/ number of working age population(15 to 64 years) from 1991 to 2018. I have here taken three different depreciation rates for seeing if depreciation rate change cause any difference in the trend lines. Figure 5(a) represents the Growth accounting figure when depreciation rate is 3%, Figure 5(b) represents the Growth accounting figure when depreciation rate is 5%, Figure 5(c) represents the Growth accounting figure when depreciation rate is 7%

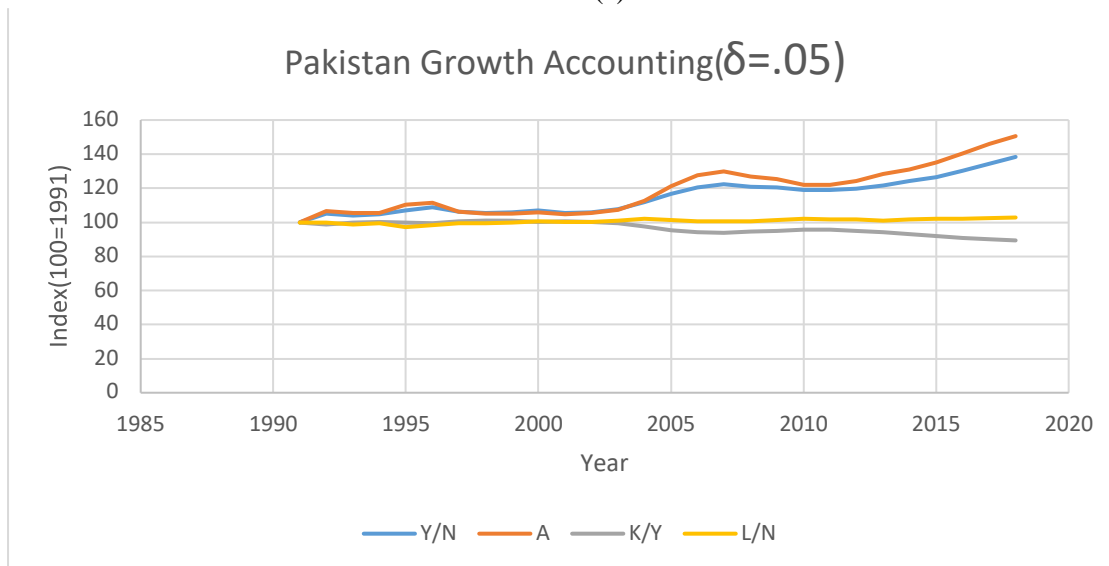
We can see that in case of Bangladesh real GDP and working age population ratio, then from technology which is total factor productivity. In fact the A and Y/N line is much closer to each other. The gap is minimal compared to Bangladesh. So the contribution of technological progress to economic growth of India is higher than Bangladesh. The capital output ratio is much lower than TFP and employment and working age population ratio is much lower than K/Y. So the sources of India's economic growth are coming mostly from Y/N and technological progress.

Growth Accounting (Pakistan Scenario):

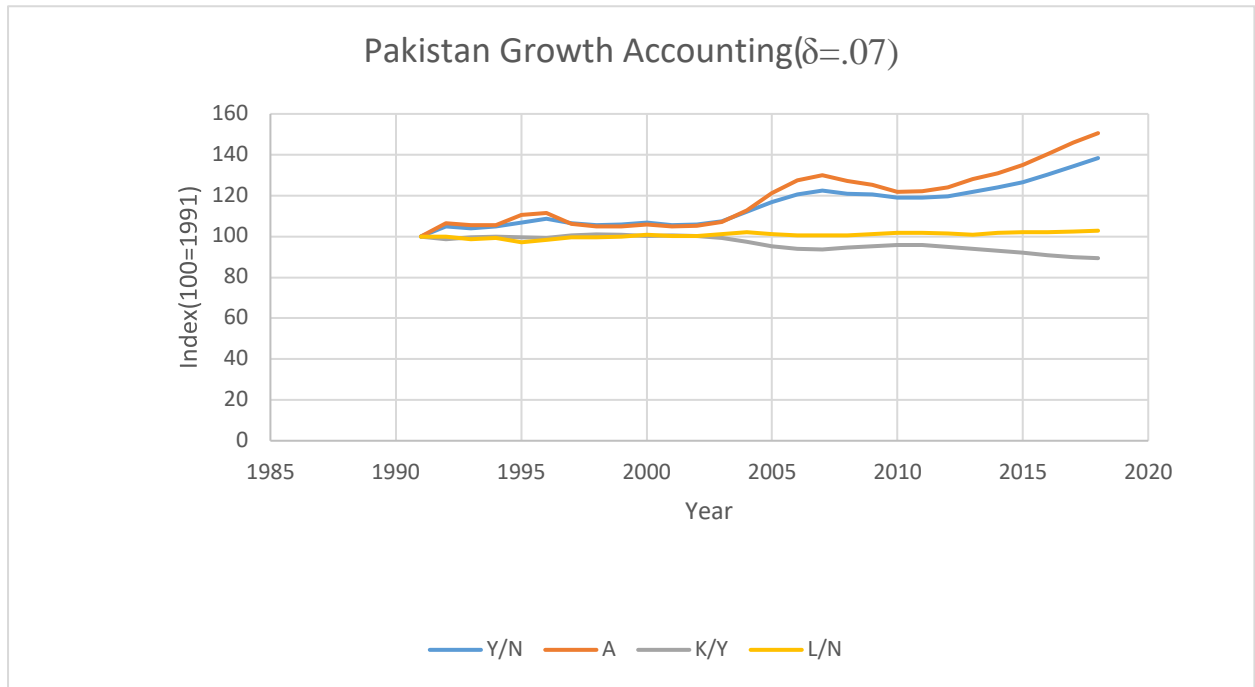
The data are given in the Appendix section. Having done the exercise for growth accounting we can see the following three scenarios. For depreciation rate .03, .05, .07 the scenarios are:



(a)



(b)



(c)

Figure 6: Growth Accounting in Pakistan (a) (b) (c)

The following figure shows the sources of growth of economy for Pakistan. The Blue line represents real GDP/Number of working age population(15 to 64 years) trend, the orange line represents the Total Factor Productivity, the Gray line represents the capital output ratio ,the yellow line represents the Number of population employed/ number of working age population(15 to 64 years) from 1991 to 2018. I have here taken three different depreciation rate for seeing if depreciation rate change cause any difference in the trend lines. Figure 6(a) represents the Growth accounting figure when depreciation rate is 3%, Figure 6(b) represents the Growth accounting figure when depreciation rate is 5%, Figure 6(a) represents the Growth accounting figure when depreciation rate is 7%.

We can see that in case of Pakistan the scenario is quite different from Bangladesh and India. Here the economic growth is coming mostly technology, which is total factor productivity, then from Y/N, then from L/N and then from K/Y. In fact the trend line of A is much higher than Y/N line. So the contribution of technological progress to economic growth of Pakistan is more than anything else. The capital output ratio is much lower than the employment working age population. So the source of economic growth is

coming mostly from technological progress. So starting from a semi-industrialized economy the present condition of economic growth is technological expansion in case of Pakistan.

Comparison of TFP among Bangladesh, India and Pakistan

Now let's see the condition of TFP for Bangladesh, India and Pakistan. We have seen from Figure 4, 5 and 6 that the TFP is higher in case of Pakistan and the gap between Y/N and TFP is minimal in case of India compared to Bangladesh. Now Plotting the three TFP we'll see which country is ahead of technological expansion. I have taken TFP considering $\delta=.05$ because I have shown earlier that change in depreciation rate doesn't put any significant impact on the general scenario.

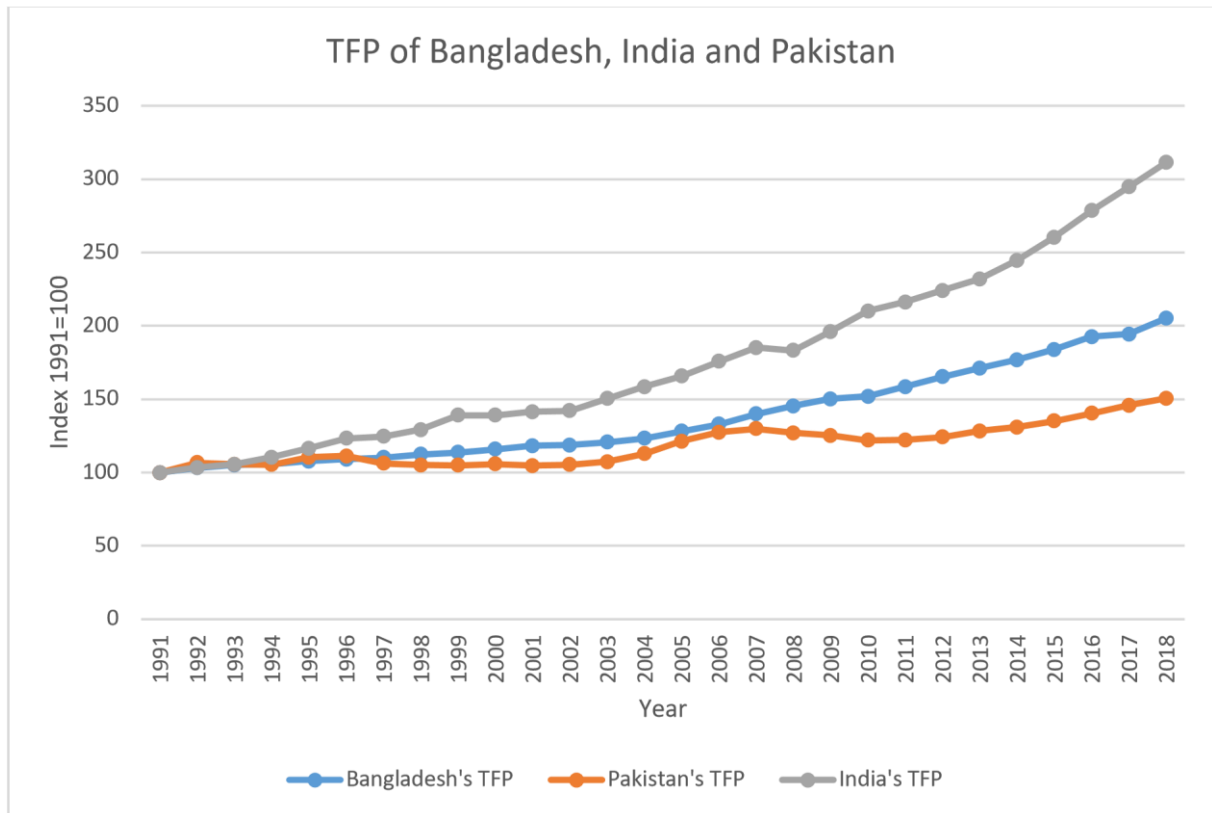


Figure: 7 TFP of Bangladesh, India and Pakistan

Figure 7 represents Total Factor Productivity lines for Bangladesh, Pakistan and India. The Blue Line represents the TFP of Bangladesh. The orange line represents the TFP of Pakistan and the Gray line represents the TFP of India. From the figure we can see that India's TFP is higher compared to

Bangladesh and Pakistan. Bangladesh's TFP is higher compared to Pakistan. So India's Technological progress is higher than Bangladesh and Pakistan.

4.3: Other Factors

Now let's focus on some scenario of Bangladesh which will tell us some other condition of Bangladesh.

The next section is designed like this and we shall get some interesting insights from there.

Innovation Index:

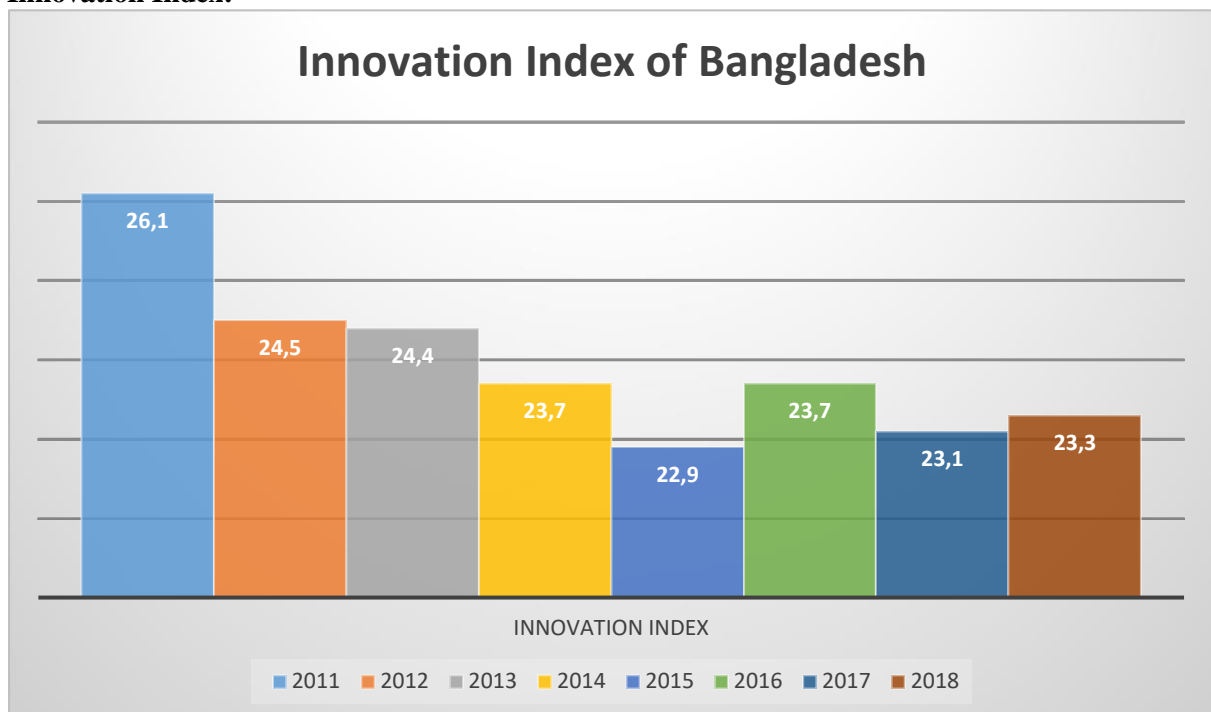


Figure: 8 Innovation Index of Bangladesh

The innovation Index shows how much a country is enriched in case of innovation. We can see from figure 8 that the innovation index is falling down from 2011. In 2011 the innovation index was 26.1, in 2012 it was 24.5, in 2013 it was 24.4, in 2014 it was 23.7 in 2015 it was 22.9. So it was continuously in a lower trend from 2011 to 2015. In 2016 it increased slightly from 22.9 to 23.7. In 2017 it dropped again to 23.1, and in 2018 it increased slightly to 23.3. So analyzing the overall situation we can say that Bangladesh does not have any appreciative movement case of innovation.

Internet user individuals:

This indicator shows which percentage of population uses internet. This figure shows internet users from 1997 to 2017.

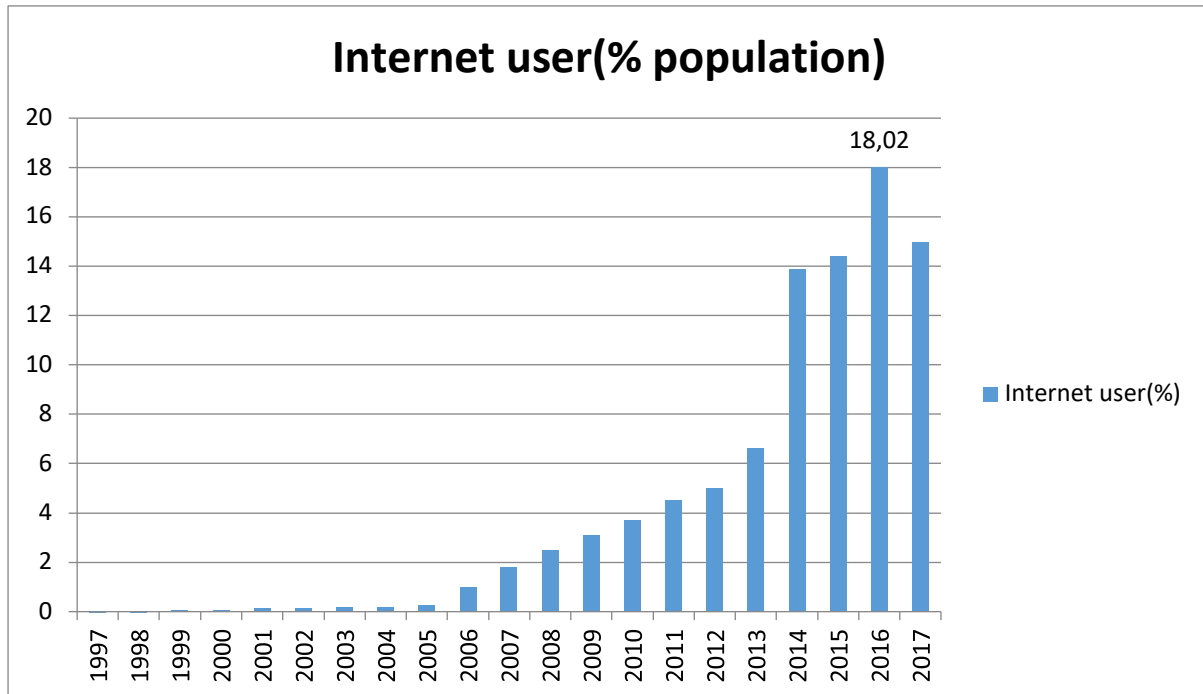


Figure: 9 Internet users (% population) in Bangladesh.

In 1997 the use of internet was 0%, and the maximal use recorded was 18.02% in 2016. Internet plays now an important role for promoting business. So expansion of internet facilities can be a good intermediary for expanding business. From the figure we can see that from 1997 to 2005 the internet users were much fewer. We can see the users are increasing gradually. The users were increasing from 2006 to 2013 gradually and in 2014 we can see a sharp increase in internet user individuals. In 2015 this percentage increased a little bit more and in 2016 there was a sharp increase again. In 2017 the user of internet fell a little.

Industrial Production (% change) in Bangladesh:

This data shows the industrial production change in Bangladesh from 2015/Q3 to 2018/Q4.

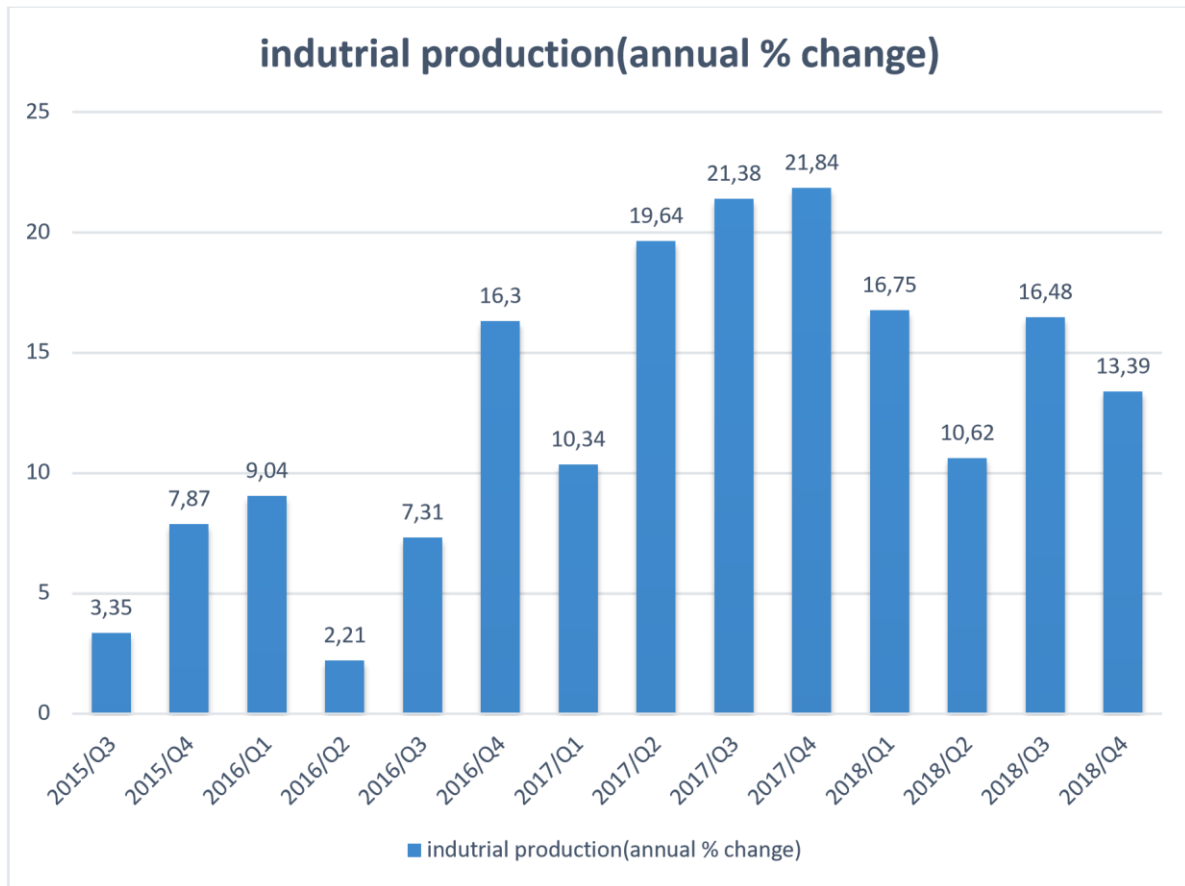


Figure: 10 Industrial Production (annual % change)

The minimum industrial production was 2.21 % in 2016/Q2 and maximum was 21.84% in 2017/Q4. Quantity of production is very important. More production indicates more expansion. So in case of developing country like Bangladesh, production plays an important role for growth. We can see from 2015/Q3 to 2018/Q3 there was many ups and downs in production changes. In 2015/Q4 there was a sharp increase and in 2016/Q2 there was a sharp fall. Again from that point to 2016/Q4 there was a sharp increase in industrial production. Again in 2017/Q1 there was a sharp fall. Again there seen a sharp increase till 2017/Q4 including the highest in 2017/Q4 in this figure. Again in 2018 there was a sharp fall till 2018/Q2. In 2018/Q3 the industrial production change increased a little bit and again fall in 2018/Q4.

Trade openness: export plus import as percentage of Gross Domestic Product (GDP):

The following figure shows the trade openness of Bangladesh from 1960 to 2017.

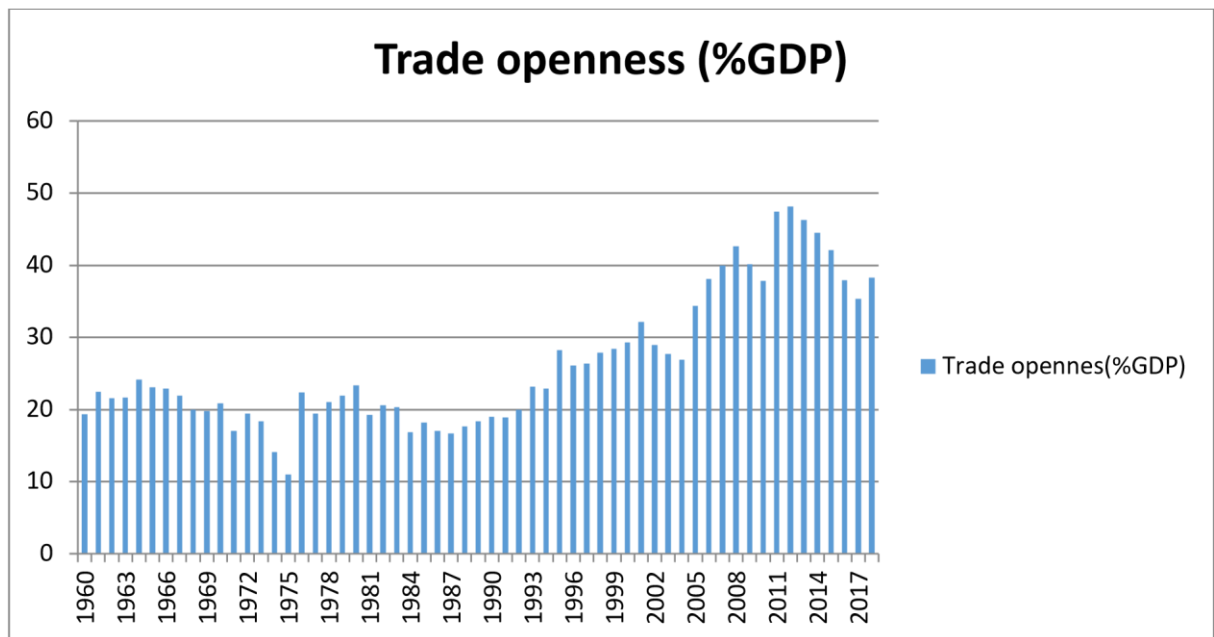


Figure: 11 Trade openness (% GDP) in Bangladesh

From the following figure we can see that the trade openness in Bangladesh has increased sharply from 2005 and from 2012 we can observe a decreasing trend. From the figure we can see that trade openness was minimum in 1975 which was 10.99% and the maximum was in 2012 which was 48.11%.

During the last three decades, in theoretical and empirical literature, the relationship between economic growth and trade openness has received a great deal of attention. However, there is no consonance on if greater trade openness animates economic growth. In accordance to the theory of comparative advantage, if one country wants to trade with another one the hindmost will produce goods in which it has a comparative advantage. This will specialize the sector for that it will have better factor endowments and produces good on a bigger amount. As a matter of fact, productivity and export will go up in this sector, which will boost up the overall growth of the economy. Kruger(1978) and Bhagwati (1978) said that the trade liberalization emboldens the sectors that have economies of scale which helps to improve the long run productivity and efficiency.

According to the new endogenous growth model as a result of international diffusion of advanced technology there is a positive relationship between trade openness and economic growth (Coe & Helpman 1995; Grossman & Helpman 1991a; Romer 1994). A country with a higher degree of trade openness has a higher ability to use technologies which is generated in advanced economies. This greater capability of technology uses leads them to expand faster than a country that have lower degree of openness.

Business environment in Bangladesh:

The following figure shows the cost of starting business(% GNI) in Bangladesh from 2013 to 2018.

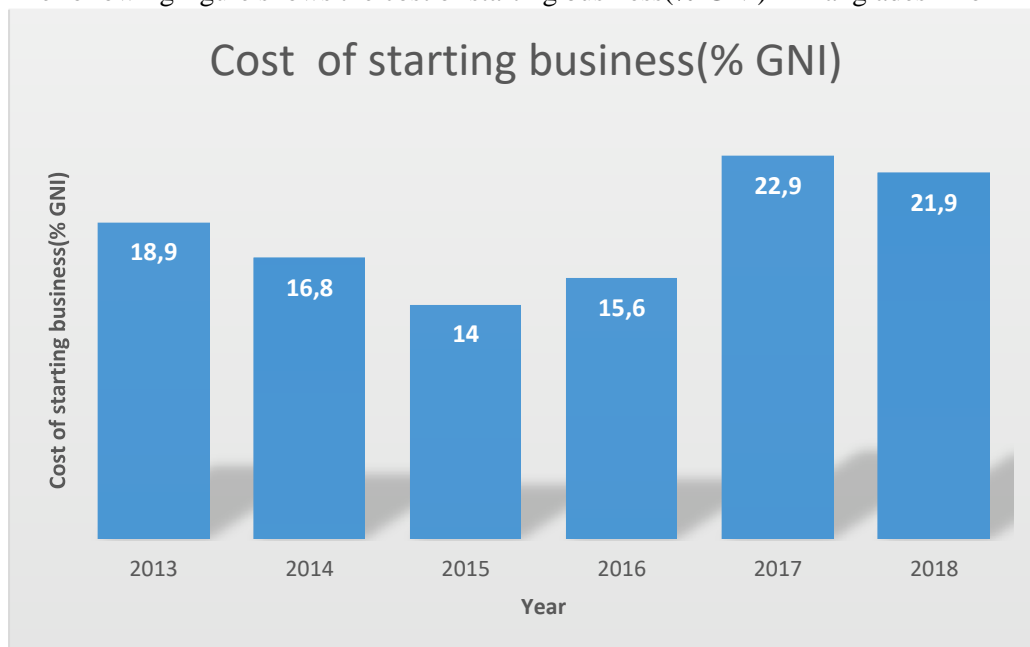


Figure 12: Cost of starting business (% GNI) in Bangladesh

Business is very important for a country's economy because it provides goods and services. Most important thing is business creates jobs. Business can do these things more effectively and efficiently than individuals. Almost everything we use in our daily life is related to business. For example we buy internet access from a business. Even, I am writing this paper on computer that was produced by a business. Business creates necessary job sectors for individuals which helps to expand output and contribute to nation's economy. So for any country to grow faster business environment is very important.

We can see from the following figure that the cost of business is increasing day by day. From 2013 to 2018 the minimum cost of business was 14% in 2015 and highest cost of business was in 2017 which is 22.9% in 2018 it decreases a very little amount which is 21.9%. So If we want to expand our economy, we should have a business-friendly environment.

Poverty and Inequality:

The Italian statistician Corrado Gini developed the Gini Index or Gini coefficient in 1912. It is often used as a gauge of economic inequality. This is often used as a measurement tool for economic inequality, income distribution or wealth distribution among a population. The coefficient ranges from 0% to 100% or in another way from 0 which indicates perfect equality to 1 which indicates perfect inequality of wealth. A higher gini index indicates greater inequality.

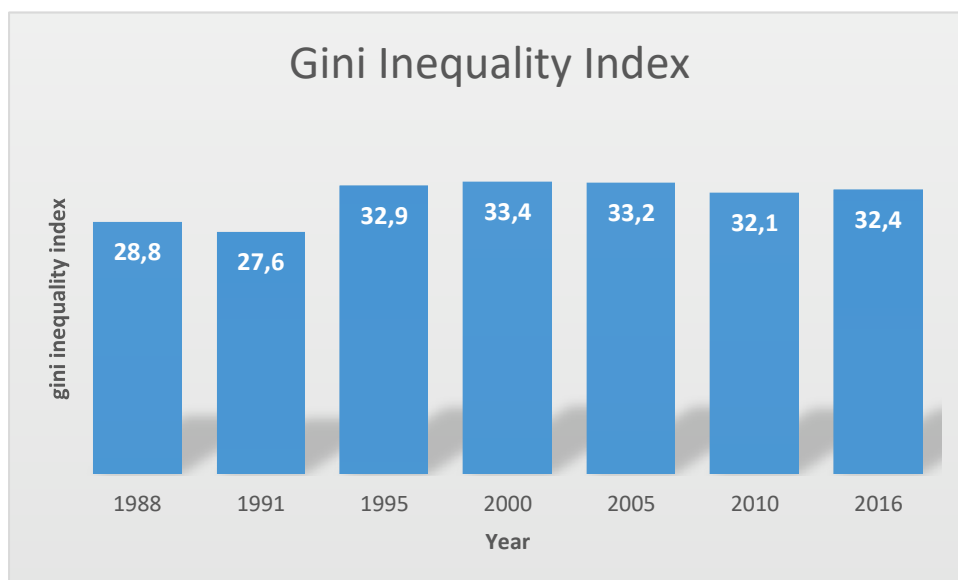


Figure: 13 Gini Inequality Index of Bangladesh

The following figure shows the gini inequality index of Bangladesh. From this figure we can see that the minimum was in 1991 with a value of 27.6 and maximum point was in 2000 with a value of 33.2.

The increasing trend of gini inequality index indicates higher inequality.

The Multidimensional Poverty Index:

The Multidimensional Poverty Index identifies the deprivation of health, education and standard of living of individuals. Among the 104 countries Bangladesh ranked 73, Pakistan 70, and India 74.



This picture was taken during the recent flood in Kurigram, Bangladesh. She is crying out of hunger and she had no food for 3 days . If this scenario is still to watch in the same plot where Bangladesh is the top highest rich growing country in the world then we can easily understand per capita income growth is increasing just because of rich people are increasing and many people even cannot afford daily food but still have per capita income of 1698 \$. Though the poverty ratio (% of total population) is decreasing, but not in a sufficient amount. Every year many people commit suicide for being unable to fight with hunger and poverty. Coming to this point of time this is very pathetic that one image of Bangladesh is showing as the highest rich growing country and on the other hand people are dying and committing suicide out of hunger and poverty.

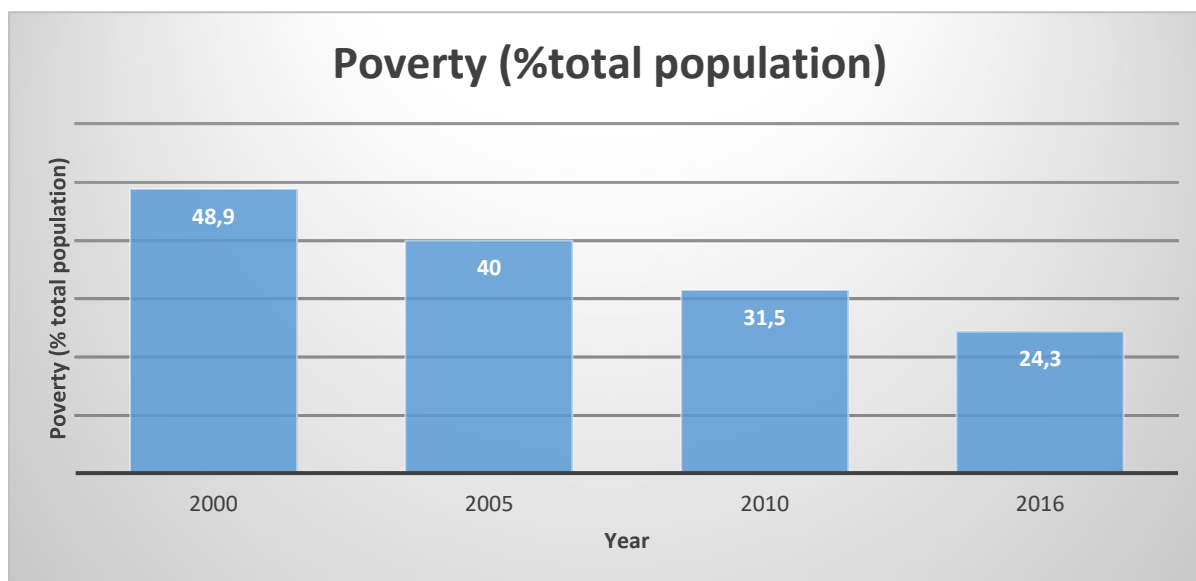


Figure: 14 Bangladesh Poverty Ratio.

The data shows that Poverty Ratio is decreasing day by day. In 2016 it reaches to 24.3% which is quite impressive. But the ratio is not small enough. Almost one fourth of population live under poverty. World Bank provides data for poverty ratio from 2000 to 2016. In this data the highest was recorded in 2000 which was 48% and the lowest was in 2016 which was 24.3%.

Fragile State Index:

This is basically an annual report published by the United States. The index's ranks are based on twelve indicators of state vulnerability, grouped by category. This shows whether the states vulnerability to collapse or conflict. The categories are sustainable, stable, warning and alert.

Table:1 Category wise FSI score

Category	FSI score
Alert	90.0-120.0
Warning	60.0-89.9
Stable	30.0-59.9
Sustainable	0.0-29.9

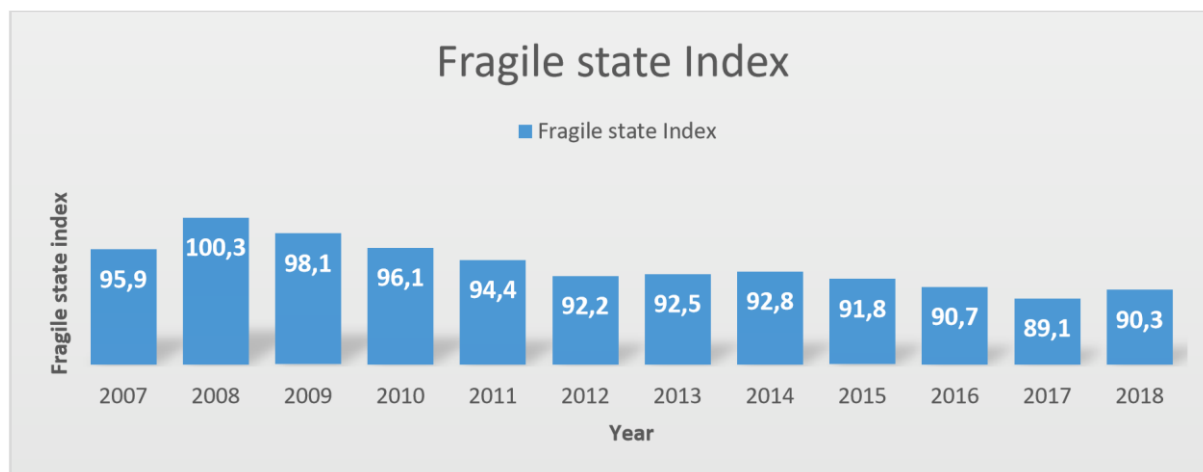


Figure:15 Bangladesh Fragile State Index.

This data reveals us that Bangladesh’s vulnerability is in “Alert” state. That means though per capita GDP growth is increasing, this is not improving the cohesion, Economic, Political, Social vulnerability. Now to overcome the vulnerability I have some policy implications; so that economic growth means really a growth in all framework. Before that we need to know some information about districts in Bangladesh which are extremely poor.

Once the pocket of seasonal famine called monga, northern district of Kurigram is still home to the highest percentage of the poor in Bangladesh. 71 out of 100 people in Kurigram live in the condition of extreme poverty. Bangladesh Bureau of Statistics in its latest report published in Household Income and Expenditure Survey (HIES 2016) shows that this people even cannot buy their regular meal for their families and themselves. The rate of poverty is very high in this district. Even some areas have maximum 77% poor people and overall minimum 66% people are poor here. The survey also found that poverty concentration is high in 10 districts. Among these 10 districts, 5 are in Rangpur Division.

Other than Kurigram, the four other districts with an increased concentration of poor people are Dinajpur, Gaibandha, Rangpur, and Lalmonirhat. In Dinajpur the poverty rate is 64.3 percent, in Gaibandha the rate of poverty is 43.8 percent, and in Lalmonirhat 42 percent people are poor. The other five poverty-prone districts are Bandarban, Khagrachhari, Jamalpur, Kishoreganj and Magura. The

northern region of the country particularly greater Rangpur was gained attention of media due to extreme poverty in 1970s. In off season people of that area had to starve. Poverty in some regions is very high. This kind of district-wise survey helps government to understand the condition more closely.

The survey also revealed that poverty rate is lowest in Narayanganj, 2.6 % only. There are 10 most affluent districts in the country, among them 7 belongs to Dhaka division. Munshiganj has a poverty rate of 3.1%, Madaripur 3.7%, Gazipur 6.9%, Faridpur 7.7%, Dhaka 10%, and Narsingdi has 10.5% poverty. Beside that, Brahmanbaria district has a poverty rate of 10.3%, in Moulvibazar the rate is 11%, and in Sylhet poverty rate is 13%.

The overall poverty rate has come down to 24.3% from 31% in six years according to the preliminary report of HIES 2016. The extreme poverty rate falls into 12.9 % in 2016 according to the report. According to Bangladesh Bureau of Statistics the country's overall population is 162 million. Among them the total number of people who are poor is 3.92 million and the total number of people who are extreme poor is 2.8 million.

Some Policies:

I want to discuss about some policies now:

- 1) Identify the poorest districts of Bangladesh and make a plan for how these districts can overcome poverty problem.
- 2) Establish Garment factories, Industry or other business zone.
- 3) Provide proper educational facilities.
- 4) Provide IT training.
- 5) Ensure if there are proper implication of geriatric allowance.
- 6) Focus on the poorest country and make a development scheme for their infrastructural change.
- 7) Make them skilled to enter into the effective labor force, etc.
- 8) Besides giving incentive for improving the infrastructure, government should ensure that the allotted amount cannot go in wrong hand.

- 9) For stopping this type of corruption, another governing body should be employed to look whether the fund is using in a manner as it should be.
- 10) Establish handicraft training center.
- 11) Encourage them to start small business.

Chapter 5

Conclusion:

The paper analyses the sources of growth and also discuss about some other things by which one can get an idea about the overall condition of Bangladesh. Here the Hayashi, Kehoe and Prescott approach has been adopted to see the sources of economy of Bangladesh, India and Pakistan which were one single nation until 1947 partition and emerged as three different nation finally in 1971. At a very infant stage, these countries faced various challenges and obstacles to see the light of growth. There are some limitations in this paper. Among them, the most important thing is a huge gap between these three countries' populations and areas. Especially India's population and area are larger than Pakistan and Bangladesh. Other than that, political dissimilarities between these three countries have affected their overall condition, especially employment rate and hunger. Another limitation is data availability. It would have been convenient to analyze overall conditions starting from 1940 because changes could then be easily traceable. But this limitation is small because this paper focuses on the present conditions.

Pakistan's sources of growth are mostly from technology according to the empirical study done here which matches the information provides by the internet source. Bangladesh and India's sources are kind of similar, but India is more advanced in its technological expansion than the other two. Other factors like business environment analysis, fragile state index, poverty ratio etc. have been put into limelight because these factors are the indicators by which one can easily understand about the situation or condition of economy of a country. Production is very important for expansion. Business is the source of production of goods and services. Other than that business can create jobs. So a better business environment and lower cost of business can give birth to some new businesses, some new job sectors which will stimulate our economy to go up and keep the unemployment rate to be low. To eradicate something one should focus on the root level. Government should focus on the cities with higher poverty rate and identify the causes of this extreme poverty in these areas. By doing that, government can give its focus to the problems that induce poverty and take necessary steps to upgrade those areas.

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Appendices:

Appendix 1

Appendix 1A

year	GDP per capita (current US \$)
1960	89.03524
1961	97.59527
1962	100.1221
1963	101.9014
1964	100.2211
1965	106.6466
1966	112.6654
1967	122.8706
1968	122.8476
1969	135.1474
1970	140.0027
1971	133.5514
1972	94.38168
1973	119.5597
1974	182.02
1975	277.5706
1976	141.1972
1977	131.3732
1978	176.0339
1979	200.7697

1980	227.7519
1981	247.6496

1982	220.7188
1983	204.4177
1984	213.9967
1985	245.4539
1986	233.658
1987	253.9745
1988	270.6996
1989	285.8292
1990	306.2687
1991	293.1604
1992	293.645
1993	300.5558
1994	299.533
1995	329.4241
1996	394.7175
1997	401.4987
1998	407.4292
1999	409.5432
2000	418.069
2001	415.0344
2002	413.0803
2003	446.3107
2004	475.2919

2005	499.4619
2006	509.6401
2007	558.0519
2008	634.9871
2009	702.2644
2010	781.1536
2011	861.7584
2012	883.105
2013	981.8399
2014	1118.854
2015	1248.453
2016	1401.621
2017	1563.994
2018	1698.263

Appendix 1B

year	GDP growth rate(annual %)	population rate(annual%)	growth
1960			
1961	3.159049	2.771567	
1962	2.566309	2.775614	
1963	-3.22062	2.816682	
1964	7.773973	2.906859	
1965	-1.40862	3.012129	
1966	-0.61393	3.150249	
1967	-4.99506	3.230446	
1968	6.10295	3.141838	
1969	-1.62346	2.850252	
1970	3.066662	2.447036	
1971	-7.35333	2.002394	
1972	-15.3864	1.655749	
1973	1.779978	1.507254	
1974	7.830789	1.620075	
1975	-5.90069	1.90782	
1976	3.322467	2.238443	
1977	0.14171	2.496344	
1978	4.254798	2.668078	
1979	1.991282	2.718203	
1980	-1.85256	2.685745	

1981	4.443148	2.636995
1982	-0.49972	2.612842

1983	1.215517	2.599438
1984	2.107824	2.6056
1985	0.669021	2.620591
1986	1.464268	2.634995
1987	1.078539	2.630223
1988	-0.20729	2.595028
1989	0.274083	2.523388
1990	3.086984	2.429599
1991	1.106644	2.325303
1992	3.114221	2.233022
1993	2.465581	2.16826
1994	1.690416	2.140081
1995	2.901246	2.134496
1996	2.319628	2.130485
1997	2.306687	2.111534
1998	3.01468	2.07734
1999	2.574209	2.022751
2000	3.2575	1.952387
2001	3.113805	1.886287
2002	1.960382	1.82007
2003	2.941853	1.731266
2004	3.55336	1.615198

2005	4.965843	1.484745
2006	5.244531	1.34713
2007	5.753421	1.226618
2008	4.80617	1.145653
2009	3.878501	1.116806
2010	4.39098	1.124803
2011	5.253096	1.144262
2012	5.298245	1.154948
2013	4.794402	1.156713
2014	4.856108	1.142595
2015	5.368783	1.117284
2016	5.950915	1.0913
2017	6.142104	1.070244
2018	6.737018	1.050045

Appendix 1C:

Growth rate

Year	Bangladesh	Pakistan	India
1961	6.058161	5.987346	3.722743
1962	5.453031	4.482859	2.931128
1963	-0.45589	8.688832	5.994353
1964	10.95279	7.569757	7.45295
1965	1.606258	10.41937	-2.63577
1966	2.566812	5.789952	-0.05533
1967	-1.87586	5.400613	7.825963
1968	9.489454	7.233221	3.387929
1969	1.220858	5.5079	6.5397
1970	5.619852	11.35346	5.15723
1971	-5.47948	0.468373	1.64293
1972	-13.9737	0.813406	-0.5533
1973	3.32568	7.064264	3.295521
1974	9.591956	3.540192	1.185336
1975	-4.08821	4.211416	9.149912
1976	5.661361	5.15619	1.663104
1977	2.673056	3.947698	7.254765
1978	7.073838	8.048534	5.712532
1979	4.801635	3.758436	-5.23818
1980	0.819142	10.2157	6.735822
1981	7.233944	7.920764	6.006204
1982	2.134328	6.537487	3.475733

1983	3.881046	6.778378	7.288893
1984	4.80331	5.065206	3.820738
1985	3.342015	7.592115	5.254299

1986	4.173383	5.501654	4.776564
1987	3.772402	6.452343	3.965356
1988	2.416257	7.625279	9.627783
1989	2.836582	4.959769	5.947343
1990	5.622258	4.458587	5.533455
1991	3.485228	5.061568	1.056831
1992	5.442686	7.705898	5.482396
1993	4.711562	1.757748	4.750776
1994	3.890126	3.737416	6.658924
1995	5.121278	4.962609	7.574492
1996	4.522919	4.846581	7.549522
1997	4.489896	1.014396	4.049821
1998	5.177027	2.550234	6.184416
1999	4.670156	3.660133	8.845756
2000	5.293295	4.260088	3.840991
2001	5.077288	1.982484	4.823966
2002	3.833124	3.22443	3.803975
2003	4.739567	4.846321	7.860381
2004	5.239533	7.368571	7.922943
2005	6.535945	7.667304	7.923429
2006	6.671905	6.177542	8.060729
2007	7.058599	4.832817	7.660824

2008	6.01379	1.701405	3.086699
2009	5.045125	2.831659	7.861882
2010	5.571802	1.606692	8.497587
2011	6.464384	2.748403	5.241314
2012	6.521435	3.507033	5.456388
2013	6.01361	4.396457	6.386106
2014	6.061059	4.674708	7.410228
2015	6.552653	4.731147	7.996254
2016	7.113489	5.526736	8.169527
2017	7.284184	5.700621	7.167889
2018	7.863709	5.430011	6.982334

Appendix 2
Growth Accounting Data

Appendix 2A

Bangladesh:

Year	GDP '000' million constant US\$ 2010	Investment '000' million constant US\$ 2010	Working age population (000)	Total em- ployed person(000)
1991	43899.11	6465.535	58175.25	32236.65
1992	46288.4	6724.641	59908.17	33190.92
1993	48469.31	7475.38	61702.31	34170.74
1994	50354.83	8165.921	63562.04	35227.35
1995	52933.64	8950.516	65491.12	36352.81
1996	55327.79	10020.25	67408.49	37403.62
1997	57811.95	10667.51	69389.24	38456.91
1998	60804.89	11639.65	71418.92	39563.94
1999	63644.57	12639.1	73481.24	40641
2000	67013.46	13538.72	75559.25	41756.31
2001	70415.93	14612.98	77506.78	42707.79
2002	73115.06	15697.27	79483.49	43620.54
2003	76580.4	16899.27	81458.46	44550.45
2004	80592.85	18286.46	83394.68	45625.23

2005	85860.36	20071.89	85272.65	46678.25
2006	91588.88	22056.58	86914.92	47808.42
2007	98053.77	23632.94	88509.49	48515.59
2008	103950.5	25952.54	90085.08	49140.51
2009	109195	27869.95	91680.75	49455.35
2010	115279.1	30256.9	93328.52	51131.9
2011	122731.2	33149.75	95108.89	51867.64
2012	130735	36652.93	96907.35	52620.69
2013	138596.9	38619.22	98736.98	53362.4
2014	146997.3	42425.17	100613	54349.15
2015	156629.5	45445.33	102533.1	55349.44
2016	167771.4	49494.22	104436.6	56374.88
2017	179992.2	54517.28	106382	59722.87
2018	194146.2	60242.54	108327.3	60873.46

Appendix 2B

India

Year	GDP '000' million constant US\$ 2010	Investment '000' million constant US\$ 2010	Working age population (000)	Total em- ployed person (000)
1991	512929.1	100535.8	520272.2	297668.5

1992	541049.9	113529.5	532374.4	304358.5
1993	566753.9	116144.4	544905.9	311059.5
1994	604493.7	138765.7	558019.7	318724.1
1995	650281	149562.4	571765.9	325540.6
1996	699374.1	150922	585146.6	331836.6
1997	727697.5	173379.5	599111	338713.4
1998	772701.3	179931.8	613586.4	345565.7
1999	841052.6	211662.6	628437.5	352496.8
2000	873357.3	199966.7	643545.6	359890
2001	915487.8	209098	657781.7	368476.1
2002	950312.7	224906.6	672383.3	377180.2
2003	1025011	260227	687264.2	386345.5
2004	1106222	337704.4	702330.9	396606.3
2005	1193873	392574.9	717517.5	406724.8
2006	1290108	445082.5	732023.6	409845.4
2007	1388940	525862.9	746636.1	412889.7
2008	1431813	498391.1	761335.7	415065
2009	1544380	584378.2	776202.6	415796.2
2010	1675615	666653.9	791275.6	417548.2
2011	1763440	692920.9	805553.6	417405.7
2012	1859660	722675.4	820297.1	417088.3
2013	1978420	695888.3	835220.4	424124.9
2014	2125025	749427.3	849864.3	431722.5
2015	2294947	784871.6	863969.1	438516.1
2016	2482434	813104	877809	445154.5

2017	2660372	897338.2	890719.3	451746.1
2018	2846128	981931.3	903098.5	456976.9

Appendix 2C

Pakistan

Year	GDP '000' million constant US\$ 2010	Investment '000' million constant US\$ 2010	Working age population (000)	Total em- ployed person (000)
1991	83919.14	17644.03	58633.64	29476.89
1992	90385.86	19476.59	60186.63	30218.5
1993	91974.62	20245.1	61828.67	30699.79
1994	95412.09	20090.2	63577.88	31768.59
1995	100147	20858.72	65452.27	31970.16
1996	105000.7	22035.61	67492.4	33346.64
1997	106065.8	21239.31	69688.34	34865.07
1998	108770.8	21886.49	72011.85	36000.17
1999	112751.9	19874.93	74431.1	37391.21
2000	117555.3	20892.86	76922.55	38945.12
2001	119885.8	21787.62	79305.97	40003.52
2002	123751.4	21733.35	81762.47	41155.95
2003	129748.8	23112.11	84300.62	42812.07

2004	139309.4	21917.49	86928.66	44568.32
2005	149990.7	24715.52	89651.02	45618.03
2006	159256.5	29286.68	92399.59	46653.48
2007	166953	30047.45	95241.84	48159.04
2008	169793.6	31351.68	98165.3	49601.95
2009	174601.5	29998.41	101152.8	51510.05
2010	177406.9	28038.37	104187	53371.9
2011	182282.7	26160.14	107102.1	54794.48
2012	188675.4	26824.85	110061.5	56191.92
2013	196970.5	27569.87	113061.5	57366.28
2014	206178.3	28329.71	116097.5	59458.16
2015	215932.8	32451.7	119164.3	61091.96
2016	227866.9	34811.78	122148.4	62704.89
2017	240856.7	38134.6	125169.5	64442.26
2018	253935.3	40298.11	128214.8	66278.09