Economic Effects of the External Debt Crisis for Pakistan

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Submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy

Deakin University Australia
December 2012
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Signed:  [Signature Redacted by Library]

Date:  December 2012
Dedication

This thesis is dedicated to my following relatives:

- My honourable father Mr. Fazal Elahi Ajiz (Sufi poet of Urdu, Punjabi & Persian)
- My honourable mother Mrs. Ayesha Begum
- My honourable paternal aunt Mrs. Irshaad Begum (Phoophi Ji Sehb)
- My honourable uncle Hakeem Noor Muhammad Janjua
- My honourable sister Zareenah
- My honourable wife Assistant Professor Mrs. Rukhsana Mir
- My honourable mother-in-law Mrs. Gulzar Begum
- My honourable daughter Masooma Anjum
- My honourable daughter Sidrah Anjum
- My honourable daughter Haneen Anjum
- My honourable daughter Zuha Anjum
- My honourable son Muhammad Nabeel Anjum
- My honourable son Muhammad Saneem Anjum
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“In the name of Allah, the Entirely Merciful, the Especially Merciful.”

“[All] praise is [due] to Allah, Lord of the worlds.”

(The Holy Qur’an: Surat Al-Fātihah, Translation of Ayaat 1-2)

I thankfully acknowledge the countless blessings of Allah (Subhanu Wa Ta’ala), the Creator of the entire universe, Who created me as a human being and blessed me with highly valuable blessings in the form of my life, my religion Islam, my perfect body, perfect health, peace, prosperity, light of knowledge, excellent education, the company of excellent family members and relatives, excellent amenities of life and facilities, and great opportunities for seeking knowledge from honourable professors in different parts of the world (in East and West). I offer my heartiest thanks to Allah (Subhanu Wa Ta’ala) from the core of my heart for enabling me to write this thesis.

It is a matter of extreme pleasure and joy for me to duly heartily acknowledge, with my heart-felt special thanks, the highly generous and highly valuable supervisory academic contributions of my all honourable doctoral dissertation supervisors, my Principal Supervisor Professor Pasquale M. Sgro, my Associate Supervisor Dr Prasad Bhattacharya, and my Associate Supervisor Dr. Cahit Guyen regarding the timely completion of my thesis. Particularly, I express my special thanks for Professor Pasquale M Sgro for being extraordinarily sincere, affectionate, generous and cooperative. He competently inspired, encouraged, taught, guided, advised, and facilitated me. He reviewed several drafts of my thesis, and provided extremely useful critical comments, insights, and comprehensive guidance, which culminated in this final form of the thesis. I also express my special thanks for Dr. Prasad Bhattacharya for his extraordinarily generous supervision of my thesis, for his highly valuable and constructive academic guidance/generous encouragement/highly useful comments on my thesis after reading several drafts of my thesis. I also heartily thank him for his participation in our joint academic meetings and for his encouragement for submitting this thesis as soon as possible. Moreover, I express my special thanks for Dr Cahit Guyen for his participation in our joint academic meetings and for his highly useful academic guidance. I express my heart-felts thanks for my honourable professors Sayyid Tahir, Chang, Ragan, Gormely, Asad Zaman, and Abdul-Latif Shafa’i for encouraging me to join a Ph.D. program. I heartily thank academic support provided by academicians Hayat Khan, Chris, Mehmet, Ali Khan (John Hopkins), Dr. Mushtaq, Sifat, Abdul-Aziz, Hakim Syed Saharanpuri, Roger Horn, Tanya Castleman, Nava, Hamid Hasan, Nauman Ejaz, Anwar Shah, Arafín, Waqar, Saqib, Abdul Jabbar, Ishaq Bhatti, Pervez Janjua, and Mansoor.

It is a matter of immense pleasure for me to express my heart-felt thanks for my late honourable parents Mr. Fazal Elahi Ajiz and Mrs. Ayesha Begum, who expressed their highly valuable best wishes for me to excel in the arena of education. I am also immensely pleased to express my heart-felt thanks for my late honourable paternal aunt Mrs. Irshaad Begum (Phoophi Ji Sehb) for her extreme affection, social and financial generosity, and altruism for me. It is also a matter of immense pleasure for
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Abstract

Pakistan experienced an external debt crisis in 1998 - a culmination of the process of fast accumulation of external debt of Pakistan since the 1980s. This debt crisis was followed by a fully-fledged economic crisis characterized by low rates of economic growth (debt overhang). There is robust evidence of the significant positive real GDP growth effects of the growth rate of real long-term external debt as well as the significant negative real GDP growth effects of the growth rate of total debt servicing as a percentage of exports signifying external debt overhang in the short and long-run.

The effects of external debt growth variables on the growth rates of the real GDP shares of agriculture, industry, and services are also analysed. This empirical analysis confirms the lack of consensus on the external debt-growth relationship in the literature.

The vector autoregressive impulse responses of the growth rates of real GDP and three sectoral shares to their own respective shocks, and to the individual shocks of the external debt growth variables are analysed. There is empirical evidence of significant large temporary positive responses of the growth rates of real GDP, agriculture’s real GDP share, industry’s real GDP share and the services’ real GDP share, which subsided and ultimately became zero in the short-run, to respectively their own individual positive shocks only.
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Chapter 1

Introduction and a brief history of the Pakistan economy

1.1 Introduction

The external debt crises of countries have been in the news for a number of years. Some argue that the modern history of these debt crises commenced when Keynes’s policy recommendation of resorting to deficit financing successfully brought the sagging economies of the West out of the Great Depression of the 1930s. Ironically, the policy of deficit financing itself became a problem and was the cause of some of the external debt crises that have occurred since the 1970s. The recent violent protests in Greece amidst her worsening external debt crisis, which some fear will trigger sovereign debt crises in several other European countries, is just one example.

Keeping in mind a broad historical view of the global economy since the 1950s, when theories of economic development envisioned a positive role for external capital and external debt in accelerating national economic growth rates, this thesis is fundamentally motivated by both the latest global shock waves from the most recent external debt crises, especially in European countries, and the alarming external debt crises of several third-world countries, which have effectively slowed down national and global economies via the process of external debt overhang. The global dimension of the prominent sovereign external debt crises since the 1970s is evident in Table 1.1 below.
Table 1.1 A chronicle of world’s prominent national external debt crises

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Countries</th>
<th>Years of debt crisis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Latin American Countries</td>
<td>Late 1970s</td>
</tr>
<tr>
<td>2</td>
<td>Costa Rica</td>
<td>1981</td>
</tr>
<tr>
<td>3</td>
<td>Mexico</td>
<td>1982 &amp; 1994</td>
</tr>
<tr>
<td>4</td>
<td>Thailand</td>
<td>1997</td>
</tr>
<tr>
<td>5</td>
<td>Indonesia</td>
<td>1997</td>
</tr>
<tr>
<td>6</td>
<td>Korea</td>
<td>1997</td>
</tr>
<tr>
<td>7</td>
<td>Brazil</td>
<td>1998</td>
</tr>
<tr>
<td>8</td>
<td>Russia</td>
<td>1998</td>
</tr>
<tr>
<td>9</td>
<td>Pakistan</td>
<td>1998</td>
</tr>
<tr>
<td>10</td>
<td>Turkey</td>
<td>2000</td>
</tr>
<tr>
<td>11</td>
<td>Argentina</td>
<td>2001</td>
</tr>
<tr>
<td>12</td>
<td>Greece</td>
<td>2010-2012</td>
</tr>
</tbody>
</table>


Because of the internationally integrated structures of contemporary national economies in the institutional framework of economic-cum-financial globalization, the above external debt crises have triggered national, regional and global recessions.

Pakistan also experienced an external debt crisis\(^1\), which was triggered by the international economic sanctions imposed against Pakistan in the aftermath of her nuclear tests in 1998. While on the brink of sovereign debt default, Pakistan was forced by circumstances to receive additional external loans from the International Monetary Fund (IMF) subject to the conditions of implementing tough austerity measures along with the imposition of a general sales tax of 15%. It is interesting to

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\(^1\) Sherani (2002) described Pakistan’s external debt crisis in the following words (Sherani, 2002, pp. xi, 4):

“Pakistan experienced a rapid accumulation of debt and a mounting debt burden. By the middle of the 1990s, the country was exhibiting many of the classical symptoms associated with a debt trap: falling rates of investment, declining development and social spending by the Government, and progressively lower rates of GDP growth… the outturn in Pakistan’s case is not inconsistent with that of other heavily-indebted countries... high levels of external indebtedness correlate with lower-levels of economic performance across a broad spectrum of countries.”
note that the nature and the economic aftermath of the current debt crisis in Greece and the 1998 debt crisis in Pakistan have remarkable similarities. For example, the debt/gross domestic product (GDP) ratio in Pakistan, as well as in Greece, exceeded 100% during their respective debt crises. Like Pakistan’s external debt/GDP, which exceeded 54% during her external debt crisis, Greece’s net external debt/GDP ratio exceeded 54% during her external debt crisis\(^2\). National external debt had been acting as a drag on the national economies of Pakistan, and Greece, and now both Greece and Pakistan desperately need fiscal consolidation and economic growth to help resolve their respective external debt crises. In this context, it is also important to acknowledge that the above similarities of the alarming external debt overhang of Pakistan, Greece, and the other developed countries need to be treated with great caution because the national economies of these countries have quite different underlying macroeconomic structures, institutional frameworks (for example, the European Union (EU) framework versus non-EU framework), and macroeconomic indicators (for example, unemployment rate and inflation rate). Within the set of comparable South-Asian developing countries, the unsustainable total external debt/GDP ratio was over 68% for Sri Lanka, over 65% for Bangladesh, over 38% for Pakistan, and over 36% for India in the late 1990s (Chaudhary and Anwar, 2000, pp. 552-3). Amongst the indebted countries, South-Asian countries experienced the highest debt servicing burden during the period 1970-1997 and Pakistan registered the highest debt servicing burden as compared to that of India, Bangladesh, and Sri Lanka in 1997 (Ahmed, Butt and Alam, 2000, 593).

\(^2\) Hasan (1999) and Dias (2010).
Given the grave macroeconomic implications for the European Union, Greece’s external debt crisis has received a lot of attention, whereas the external debt crisis of Pakistan has not received as much. The lack of substantial and substantive research on the economic effects of Pakistan’s external debt crisis has motivated this thesis. Thus, this thesis aims at empirically determining the short and long-run aggregate and sector level growth effects of Pakistan’s external debt (that is, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports). It is motivated by Pakistan’s unsustainable record high levels of external debt, especially in the late 1990s. An alarming and salient feature of Pakistan’s 1998 external debt crisis was her external debt/GDP ratio of 54.3%, along with her total debt/GDP ratio of 102% in the fiscal year 1998/99 (Hasan, 1999). This empirical research may provide lessons for Greece and other European countries facing similar problems.

This chapter briefly describes the evolution of Pakistan’s economy during seven distinct decades, from the late 1940s to the end of the 2000s. It provides insights into its genesis, political economy, structural and sectoral change, fluctuating economic growth and external debt accumulation, and especially into the 1998-99 external debt crisis. It also highlights the macroeconomic background, nature, causes, and effects of Pakistan’s economic and external debt crises on rising inflation as well as unemployment. It highlights the role of the manufacturing sector as the driver of economic growth and structural change in the economy of Pakistan. Historically, Pakistan’s economic growth dynamics have been a clear manifestation of an external debt/aid-dependent macroeconomic growth regime. As a result, Pakistan’s economic
growth has been vulnerable especially to the shocks of the external debt burden and growing costs of external debt servicing. Consequently, Pakistan continues to be in the set of lower middle-income developing countries. Over time, the pendulum of economic policies in Pakistan has swung between the competing ideologies of capitalism, socialism, and an Islamic welfare state. During the past sixty-five years of its existence, Pakistan has progressed from a low-income to a lower middle-income developing economy — Pakistan’s GDP per capita increased from US$294 in 1980 to US$1,017 in 2010 according to the World Bank (2012).

Chapter 2 surveys both the partial and whole debt defaults on the part of several countries and the cyclical (repetitive) nature of their sovereign debt defaults, as well as the corresponding external debt crises of the defaulting countries. The literature highlights the parallel between the debt crises of Pakistan and a large number of other countries since the 19th century. It also indicates a remarkable similarity in the official policy responses, such as cuts in public expenditure on health and education, irrespective of whether they are developing countries like Pakistan or they are the developed countries such as the United Kingdom. It documents the consensus of an overwhelming majority of Pakistani economists on the causes of Pakistan’s debt crisis in the second half of the 1990s. These authors also argue that Pakistan’s chronic fiscal deficits, in the wake of very low rates of national savings and unsustainable huge balance of trade and balance of payments deficits, triggered Pakistan’s external debt crisis. It has also been argued that the burden of external debt servicing has been a hindrance to the growth of the economy — a salient feature of Pakistan’s economy, one of the fundamental hypotheses of this thesis. The
literature indicates that the prospective solution to Pakistan’s external debt crisis lies in not only realizing significantly higher sustainable national saving and investment rates, sustainable budget surpluses, and sustainable balance of trade and balance of payments surpluses, but also in implementing effective austerity reforms. While this recommended solution to Pakistan’s external debt crisis is generally similar to the recommended solutions to the debt crises of other heavily indebted countries, the solution to Pakistan’s external debt crisis requires a simultaneous sustainable substantial increase in both her national saving and investment rates as well as a strict implementation of an effective austerity program of radical macroeconomic structural, institutional, constitutional, behavioural, fiscal, and debt reforms.

Chapter 3 presents estimation results of real GDP growth models and examines the real GDP growth effects of external debt growth variables for Pakistan in the era of external debt accumulation since 1981. More specifically, it uses the unit root tests for nonstationarity, the method of Ordinary Least Squares (OLS), OLS residual and stability diagnostics, and the Johansen’s multiple cointegration tests for empirically determining the short-run and long-run effects of the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rate of real GDP. In addition, the OLS-based double-log regression models of the dependent variable real GDP, and the explanatory external debt variables, are also estimated for determining the elasticities of the real GDP with respect to the explanatory external debt variables. The main empirical result of this chapter is the robust empirical evidence of both a significant positive real GDP growth effect of the growth rate of
real long-term external debt stock, and a significant negative real GDP growth effect of the growth rate of total debt servicing as a percentage of exports, thus signifying external debt overhang in the short and long-run. In general, the overall empirical results of these short-run real GDP growth models using three control variables (the growth rates of real workers’ remittances and compensation of employees received (that is, income of border/seasonal/short-term workers employed in a country wherein they are nonresidents and the income of residents employed by nonresident employers according to the World Bank’s *World development indicators* 2012), foreign direct investment net inflows, and money and quasi money) are robust to the inclusion of two additional control variables, the growth rate of the total labour force and the first-differenced growth rate of real capital stock.

Chapter 4 presents estimation results of models of the growth rates of the real GDP shares of agriculture, industry and services, and examines the effects of external debt growth variables on the growth rates of the real GDP shares of agriculture, industry, and the services in the era of external debt accumulation since 1981. It also uses the unit root tests for nonstationarity, the OLS method, OLS residual and stability diagnostics, and the Johansen’s multiple cointegration tests for empirically determining the short-run and long-run effects of the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rates of sectoral real GDP shares using control variables. The main empirical results of this chapter are presented in Table 1.2 below.
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Short-run significant effect of the growth rate of real total external debt stock in the case of 3 control variables</th>
<th>Short-run significant effect of the growth rate of real total external debt stock in the case of 5 control variables</th>
<th>Long-run significant effect of the growth rate of real long-term external debt stock in the case of 3 control variables</th>
<th>Long-run significant effect of the growth rate of real long-term external debt stock in the case of 5 control variables</th>
<th>Short-run significant effect of the growth rate of real short-term external debt stock in the case of 3 control variables</th>
<th>Long-run significant effect of the growth rate of real short-term external debt stock in the case of 5 control variables</th>
<th>Short-run significant effect of the growth rate of total debt servicing as a percentage of exports in the case of 3 control variables</th>
<th>Long-run significant effect of the growth rate of total debt servicing as a percentage of exports in the case of 5 control variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>The growth rate of agriculture’s share of real GDP</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-**</td>
<td>+***</td>
<td>-***</td>
</tr>
<tr>
<td>The growth rate of industry’s share of real GDP</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>The growth rate of the services’ share of real GDP</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Notes: * in the cases of one cointegrating equation and two cointegrating equations; ** in the case of two cointegrating equations; *** in case of the three cointegrating equations.
Here it is pertinent to note that the above empirical evidence, of certain mutually-contradicting estimated significant positive, as well as negative effects, of any of the above four external debt growth variables on the growth rates of sectoral real GDP shares, confirms the lack of consensus on the external debt-growth relationship observed by Siddiqui and Malik (2001). Moreover, these results are not surprising since the sectoral real GDP share growth rates signify change in the sectoral-cum-structural composition of the national economy. The sectoral changes occur in such a way that some sectoral real GDP shares increase and other sectoral real GDP shares decrease (for example, real GDP shares of industry and the services increase and the real GDP share of agriculture declines due to the transfer of labour from agriculture into industry and the services as a result of higher real wages in the industry and the services than in agriculture because of higher marginal productivity of labour in the industry and the services — a result of increasingly higher levels of capital formation and technological progress in industry and the services — than in agriculture during the course of countries’ economic development based on industrialization and expansion of the services.). The changes can be either due to natural changes over time in the sectoral composition of the national economy or real GDP, or total external debt (in terms of long-term and short-term external debt), or because of the changing conditions and the fundamentals of national and global economies. In this context, it is pertinent to note that the data set on sectoral real GDP shares reported in the State Bank of Pakistan’s *Handbook of statistics on Pakistan economy 2010* has established the empirical fact of gradually decreasing real GDP share of agriculture and gradually increasing real GDP shares of industry and the services with the
passage of time, which is later illustrated in Figure 1.7. Similarly, the occurrence of changes in sectoral real GDP shares in Pakistan’s economy due to the role of changes in real long-term external debt stock during the process of its industrialization is implied by the empirical evidence of both a robust short-run significant negative effect of the growth rate of real long-term external debt stock on the growth rate of real GDP share of agriculture and a short-run significant positive effect of the growth rate of real long-term external debt stock on the growth rate of real GDP share of industry, which is reported in Table 1.2. These arguments also apply to the GDP growth effects of certain external debt growth variables during the business cycle associated with Pakistan’s external debt crisis in light of the following assertion of Ormerod and Campbell (1997, p. 88):

“The idea that the movements in GDP over the course of the business cycle are inherently unpredictable is not new in economics and some of the early quantitative thinking about the cycle, by for example Fisher (1925) and Slutsky (1937) in the 1920s and 1930s, advanced this as a hypothesis. The use of spectrum analysis confirms the validity of the hypothesis.”

Here it is also pertinent to note that certain negative real GDP growth effects as well as sectoral real GDP share growth effects are also consistent with the empirical finding of Iqbal (1994), that Pakistan’s real output growth decelerated due to the use of structural adjustment loans in non-productive activities.

Keeping in view the above arguments, a significant negative short-run effect of the growth rate of real total external debt stock on the growth rate of real GDP share of industry and significant negative long-run effects of the growth rates of real long-term external debt stock on the growth rates of real GDP shares of industry and the services reported in Table 1.2 may be due to factors such as the occurrence of several
recessions in Pakistan since 1998 and the use of external debt in unproductive activities. The above empirical evidence of existence of both positive and negative effects of the different external debt growth variables on the sectoral real GDP share growth rates is also consistent with the above argument of the inherently unpredictable movements of sectoral GDP shares because of a combination of the several aforementioned factors.

Chapter 5 estimates four unrestricted Vector Autoregressive (VAR) models: Real GDP Growth VAR Model 1\(^1\), Agriculture’s Real GDP Share Growth VAR Model 2\(^2\), Industry’s Real GDP Share Growth VAR Model 3\(^3\), and Services’ Real GDP Share Growth VAR Model 4\(^4\). It also analyses the VAR impulse responses of the growth rates of real GDP and three sectoral shares to their own respective shocks, and to the individual shocks of the above four external debt growth variables. There were significant large temporary positive responses of the growth rates of real GDP (in VAR Model 1), agriculture’s real GDP share (in VAR Model 2), industry’s real GDP share (in VAR Model 3), and the services’ real GDP share (in VAR Model 4), which subsided and ultimately became zero in the short-run, to respectively their own

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\(^1\) Real GDP Growth VAR Model 1 consists of five stationary time series, namely, the growth rates of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total external debt servicing as a percentage of exports.

\(^2\) Agriculture’s Real GDP Share Growth VAR Model 2 consists of five stationary time series of the growth rates of agriculture’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports.

\(^3\) Industry’s Real GDP Share Growth VAR Model 3 consists of five stationary time series of the growth rates of industry’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports.

\(^4\) Services’ Real GDP Share Growth VAR Model 4 consists of five stationary time series of the growth rates of the services’ share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports.
individual positive shocks. In contrast, the above impulse response functions reflect that there are neither significant positive nor significant negative responses of the growth rates of real GDP (in VAR Model 1), agriculture’s real GDP share (in VAR Model 2), industry’s real GDP share (in VAR Model 3), and the services’ real GDP share (in VAR Model 4), respectively, to the individual shocks of the unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total external debt servicing as a percentage of exports.

1.2 A brief history of the Pakistan economy

This section chronicles a brief economic history of the Pakistan economy providing some insights into Pakistan’s external debt crisis, its sources and causes, and the subsequent responses to it. Subsection 1.2.1 presents a brief history of last seven decades (from the late 1940s to the end of the 2000s) of the Pakistan economy, and highlights the process of evolution of Pakistan’s economy during those decades. Subsection 1.2.2 presents an overall snapshot of the entire history of Pakistan’s economy. Finally, Section 1.3 highlights the main conclusions.

1.2.1 Evolution of the Pakistan economy

1.2.1.1 The Late 1940s: Era of emergence of a new national economy

At its inception in 1947, Pakistan had a predominantly agrarian economy with the agriculture sector as its mainstay – agriculture contributed 53% of GDP in 1947, and
53.2% of GDP in 1949-50\(^5\). Pakistan had a population of 30 million in 1947 with 6 million people living in urban areas, 65% of the labour force working in the agricultural sector, and agricultural output contributing 99.2% of exports\(^6\). Against this background, agriculture contributed about 90% of Pakistan’s foreign exchange earnings resulting from foreign trade (exports) of her agricultural output, which were later channelled into the industrial sector for accelerating industrialization and economic growth in Pakistan\(^7\). At the same time, the living standard of the citizens of Pakistan was low – Pakistan had an average per capita income of almost $360 (1985 international dollars) in 1950\(^8\), an initial literacy rate of 10%, and only 1,014 registered doctors in 1948 for a population of 32.5 million\(^9\). Against this background, Pakistan needed to significantly improve the living standards of both her native population and her 7 million newly-arrived homeless immigrants, amidst a scenario of economic crises caused by the virtual absence of economic infrastructure, financial resources, and the requisite industrial base\(^10\). Pakistan’s very small nascent private sector did not have the requisite capital, therefore, the Government relied heavily on the public sector for the task of building the economic-cum-industrial base


\(^7\) Khan (2002).

\(^8\) Khan (2002).

\(^9\) Fasih-Uddin and Swati (2009), and Zaidi (2005).

\(^10\) Indeed, there were small industries as well as few services, and there were almost no large-scale industrial units at all in 1947 [Husain (1999), Fasih-Uddin and Swati (2009), Zaidi (2005) and The World Bank (Undated)].
of Pakistan\textsuperscript{11}. In 1949-50, Pakistan registered a national savings rate of 2\%, foreign savings rate of 2\%, and an investment rate of 4\%\textsuperscript{12}. Pakistan’s resources in its two constituent territorial domains, East Pakistan and West Pakistan, were an immense reservoir of natural resources in the form of land, and at least five major mineral resources such as natural gas, crude oil, coal, limestone, and marble\textsuperscript{13}. In 1947, estimates of poverty incidence ranged from at least 55\% to 60\% in the West Pakistan\textsuperscript{14}. In the late 1940s, Pakistan implemented a policy of imports-substituting industrialization to try and achieve economic self-sufficiency – especially self-sufficiency in the cotton textile industry\textsuperscript{15}. Later, the implementation of policy of imports-substituting industrialization resulted in fast growth in the industrial sector, diversification of industrial production, increased foreign exchange earnings by means of exports, increased dependence on imports, greater effective protection of domestic industries, and increased economic inefficiency in industrial production\textsuperscript{16}. In 1949-50, the manufacturing sector contributed 7.8\% of GDP and the services/trade/other sectors together contributed 39\% of GDP. Pakistan’s trade balance of payments was in deficit by 66 million Rupees during 1949/50-1950/51\textsuperscript{17}.

\textsuperscript{11} Fasih-Uddin and Swati (2009), and Zaidi (2005).

\textsuperscript{12} Hasan (1997).

\textsuperscript{13} Fasih-Uddin and Swati (2009).

\textsuperscript{14} Hasan (1997) and Hasan (2004, p. 63).

\textsuperscript{15} Hussain (2003), Husain (1999), and Hasan (1997).

\textsuperscript{16} Khan (2002).

\textsuperscript{17} Zaidi (2005).
1.2.1.2 The 1950s: Era of a traditional economy in transition

The 1950s was the first decade of planning, which aimed at enabling the public sector to establish industries for building the industrial foundation of Pakistan and then transfer them to the private sector against the background of the fact that almost all of the large-scale industries at the time of partition of British India were situated in those territories which became part of the newly established independent India and, therefore, then Pakistan’s economy had a negligibly small industrial base. After launching the Colombo Plan in 1951, Pakistan instituted not only a series of Five-Year Plans during the period 1955-1998 but also a Ten-Year Perspective Plan alongside a rolling Three-Year Development Plan. While acknowledging the contrast between Pakistan’s vast natural resources and her industrial backwardness, Pakistan continued its policy of imports-substituting industrialization during the 1950s. During the Korean War (1950-1953), Pakistan’s public and nascent private sector thrived on spectacular merchant profits, which were quickly transformed into industrial capital that fuelled the process of industrialization as well as accelerated it during and after the Korean War boom period 1950-52. Pakistan completely banned the imports of cotton textiles and luxury goods in 1952 and regulated virtually all imports in 1953 via the implementation of trade policies of over-valuation of

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18 Zaidi (2005), Khan (2002), and Hasan (1997).

19 Fasih-Uddin and Swati (2009).


21 Merchant profits referred to the profits realized from the Korean War-induced dramatic growth in exports of raw materials to the war-panicked countries, which were then piling up raw materials during the war [Zaidi (2005), Papanek (1996), and Hussain (2003)].
the Rupee relative to other currencies, quantitative controls on imports of luxuries and consumption goods, lower tariffs on imports of intermediate goods and capital goods, tight controls on the imports of luxuries and consumption goods, and a rigid system of import licensing, which included the export bonus scheme of distribution of the ownership of import licenses among the exporter\textsuperscript{22}. Consequently, Pakistan emerged as one of the most rapidly growing countries of the world in the 1950s mainly due to a decade-long implementation of the strategy of imports-substituting industrialization regime\textsuperscript{23}. This regime protected and promoted local infant industries via the provision of high rates of effective protection, low-cost credit supplied by government financial institutions (for example, Pakistan Industrial Credit and Investment Corporation and Pakistan Industrial Finance Corporation), cheap agricultural goods as industrial inputs, fiscal incentives which caused market distortions and industrial inefficiency\textsuperscript{24}, and an over-valued exchange rate — which enabled Pakistani industrialists to import machinery at lower prices and, thereby, reduced their costs of industrial production —, thereby significantly raising the rates of their profits, investment, and industrial output growth\textsuperscript{25}. Particularly, Pakistan’s overvalued exchange rate regime worked against the small open economy hypothesis. In contrast, anti-agriculture policy biases and anti-agriculture terms of trade between industry and agriculture caused the annual growth rate of agriculture to decline from 2.6% in 1949/50-1950/51 to 1.9%

\textsuperscript{22} Hasan (1997), (Khan, 2002), and (Zaidi, 2005).

\textsuperscript{23} Zaidi (2005) and Husain (1999).

\textsuperscript{24} Khan (2002).

\textsuperscript{25} Pakistan’s average annual rate of growth of her large-scale manufacturing sector was 23.6% per annum during 1950-1954 in contrast to her small-scale manufacturing sector’s average annual growth rate of 2.3% per annum [Zaidi (2005), Husain (1999), and Hussain (2003)].
in 1957/58-1958/59. After realization of self-sufficiency in the arena of cotton textiles in the late 1950s, the objective of export development assumed vital significance, and to help achieve this objective, Pakistan devalued the Rupee in 1955. The national savings’ performance of Pakistan in the 1950s was primarily due to the inflow of the US military and economic aid of US$500 million during 1955-58. Consequently, Pakistan conspicuously entered a new phase of foreign aid-dependent economic growth in the 1950s.

Until 1958, Pakistan’s economic policies had been merely ad hoc policy responses to the then erupting short-term economic crises. This fact is confirmed by the following observation of Khan (2002, p. 17):

“A careful review of the economic policy during this phase shows a series of ad hoc reactions to internal and external crises.”

For example, Pakistan’s controversial policy decision of not devaluing her currency in 1949, in the wake of devaluation of the pound sterling and Indian Rupee in 1949, was meant to ensure the independence of her trade policy regime from the foreign

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26 Even negative growth rates in the agricultural sector were observed — that is, -9.1% in 1950/51-1951/52 and -0.8% in 1953/54-1954/55. With the then 75% of the population of Pakistan living in the rural area, the prolonged stagnation of the agricultural sector in the 1950s restricted further growth in the manufacturing sector (Zaidi, 2005).


28 This US aid — a result of Pakistan-United States Mutual Defence Pact signed in 1954 — reduced the heavy burden of public expenditure on the budget of the public sector (Hasan, 1997).


30 Husain (1999).

31 Khan (2002).
influences\textsuperscript{32}. This policy decision culminated in the end of the then existing customs union between Pakistan and India as a result of a reaction of her traditional trading partners (for example, India and Britain) against the above policy decision of Pakistan and, therefore, it was no more possible for Pakistan to export jute and raw materials to the huge target markets in India and Britain\textsuperscript{33}. However, later Pakistan accidently discovered new target markets for the exports of her raw materials due to the unexpected eruption of the aforementioned Korean War boom\textsuperscript{34}. Similarly, in contrast to the expectations about the prospective devaluation amidst a balance of payment crisis in 1952 in the aftermath of a decrease in the prices of raw materials in the world market, Pakistan implemented policies of stringent direct controls on exchange, exports and imports instead of resorting to the policy of devaluation\textsuperscript{35}. While high tariffs and indirect taxes played a minor role in the promotion of industrialization, an over-valued exchange rate and other direct quantitative controls played a dominant role in determining the relative prices as well as incentives, which accelerated the process of industrial growth in the 1950s\textsuperscript{36}. In the late 1950s and the 1960s, the usage of massive foreign-aid as a source of cheap credit, which was rationed through the national banking and financial institutions among the investors of the private sector, played a key role in accelerating the sectoral growth rates of industry, agriculture and the services as well as the aggregate growth rate of the

\textsuperscript{32} Zaidi (2005).

\textsuperscript{33} Zaidi (2005).

\textsuperscript{34} Khan (2002) and Zaidi (2005).

\textsuperscript{35} Zaidi (2005).

\textsuperscript{36} Zaidi (2005).
economy especially in the 1960s\textsuperscript{37}. Moreover, the policies of arbitrarily neglecting agriculture and setting the pro-industry terms of trade, which favoured industry and damaged the agricultural sector, culminated in stagnation of agriculture in the 1950s\textsuperscript{38}.

In 1959 – after first military coup d'état in 1958, the martial law regime implemented a new trade policy of imposing indirect controls — in the forms of introduction of export bonus scheme (also known as a scheme of bonus vouchers, which were treated as import licenses) and free list of the goods, which could be imported without having any import license — on the domestic prices of goods including imports\textsuperscript{39}. But, Pakistan’s balance of trade deteriorated from -831 million Rupees in 1950/51 to -1043 million Rupees in 1959/60 due to sharp decrease in exports from 1,038 million Rupees in 1950/51 to 763 million Rupees in 1959/60 against the background of disappearance of Korean War boom, export taxes, and the devaluation of Rupee, which reduced the Rupee prices of exports thereby creating disincentive for exporters\textsuperscript{40}. Pakistan registered an agricultural sector growth rate of 1.6\% per annum and an overall manufacturing sector growth rate of 7.7\% per annum in the 1950s\textsuperscript{41}.

In 1959-60, West Pakistan’s Per Capita GNP was Rs.355 in contrast to the East

\textsuperscript{37} Zaidi (2005).


\textsuperscript{39} That is, an official list of items allowed to be freely imported without any requisite license [Hasan (1997) and Zaidi (2005)].

\textsuperscript{40} Hasan (1997), Zaidi (2005) and Fasih-Uddin and Swati (2009).

\textsuperscript{41} Fasih-Uddin and Swati (2009).
Pakistan’s Per Capita GNP of Rs.269\textsuperscript{42}. In anticipation of trickle-down effects of economic growth, the above regional economic disparity was partly deliberately caused by the then military regime’s discriminatory regional development policies, which concentrated both financial resources and industrial development processes in West Pakistan at the expense of East Pakistan\textsuperscript{43}. Against this background, there persisted differences between the growth performances of East Pakistan and West Pakistan — for example, the growth in the economy of East Pakistan was slower than the growth in the economy of West Pakistan in the period 1959-71 (During the period 1960-1970, East Pakistan’s real GDP growth rate was 4\% and West Pakistan’s real GDP growth rate was 6.7\%)\textsuperscript{44}. Moreover, foreign exports (trade) were not allowed to function as a driver of industrial and economic growth in East Pakistan because the foreign exchange earned by means of jute exports originating from East Pakistan was not transferred to East Pakistan’s industrialists as the aforementioned foreign exchange earnings were being made available to West Pakistan’s industrialists to be used as a driver of industrial growth in West Pakistan\textsuperscript{45}.  

1.2.1.3 The 1960s: Era of economic growth

Amidst massive foreign aid flows resulting from Pakistan’s strong strategic alliance with the USA, the decade-long period of the first martial law regime ensured long-term political stability, which enabled Pakistan to sustain high rates of economic growth.

\textsuperscript{42}Thus, the West-East Disparity Ratio was 1.32 (Zaidi, 2005).

\textsuperscript{43} Husain (1999), Khan (2002) and Zaidi (2005).

\textsuperscript{44} Khan (2002) and Hasan (1997).

\textsuperscript{45} Khan (2002).
growth in the 1960s\textsuperscript{46}. In addition, Pakistan was a member of the Central and South East Asian Treaty Organization and had signed the World Bank-sponsored Indus Basin Treaty in 1961\textsuperscript{47}. According to the earliest available formal data in the early 1960s, figures of poverty incidence ranged from 54\% in 1963-64 to almost 50\% in the early 1960s in Pakistan\textsuperscript{48}. In the 1960s, Pakistan achieved an agricultural growth rate of 5\% per annum as a direct consequence of policies of achieving significant private and public sector investments in water resources, increased incentives for farmers, mechanization of agricultural production processes, increased usage of chemical inputs such as fertilizers and pesticides, and the increased cultivation of high yielding varieties of rice and wheat\textsuperscript{49}. As the growing domestic agricultural sector supplied cheaper raw materials as the requisite industrial inputs used in the then fast growing industrial production as a result of the official policy of imports-substituting industrialization, the above agricultural growth, in turn, constituted the foundation of further industrial growth — a continuation of general trend of the 1950s — as well as exports growth in the 1960s. These successful policies of achieving high rates of growth by means of the Green Revolution-based industrialization seem to be different from the growth policies of the 1950s, which focused on fast industrial development and neglected the then stagnating agriculture\textsuperscript{50}. This change in policy occurred due to the change in political regime in the form of the establishment of the

\textsuperscript{46} Chenery and Strout (1966), and (Papanek (1996).

\textsuperscript{47} Hasan (1997).

\textsuperscript{48} Hasan (1997) and Hasan (2004, p. 63).

\textsuperscript{49} Husain (1999) and Hasan (1997).

\textsuperscript{50} Hasan (1997), Zaidi (2005) and (Khan, 2002).
martial law regime, which acknowledged the importance of development of agriculture for accelerating industrial growth and development and, therefore, launched a Green Revolution by investing a part of the significantly increased inflows of foreign aid and loans in agricultural development projects (for example, large dams) as well\textsuperscript{51}. The increased availability of foreign aid and loans was due to the military regime’s strategic alliance with the Western capitalist powers in the era of Cold War\textsuperscript{52}. These factors enabled the large-scale manufacturing sector to grow at a rate of 16\% per annum in the period 1960/61-1964/65 due to both the substantial protection of domestic industry from imports and the substantial subsidies for exporters\textsuperscript{53}.

In sharp contrast to the stagnation of agriculture in the 1950s caused by then officially policy of neglecting the agriculture, the aforementioned significant practical official attention received by the agriculture since the advent of the martial regime culminated in Green Revolution, which in turn enabled the agricultural growth to further reinforce and accelerate the industrial growth in the 1960s\textsuperscript{54}. In 1959 – after first military coup d'état in 1958, the martial law regime implemented a new trade policy of imposing indirect controls — in the forms of introduction of export bonus scheme (also known as a scheme of bonus vouchers, which were treated

\textsuperscript{51} Khan (2002), Zaidi (2005), and Hasan (1997).

\textsuperscript{52} Zaidi (2005) and (Khan (2002).

\textsuperscript{53} Hasan (1997).

\textsuperscript{54} Zaidi (2005).
as import licenses) and free list of the goods, which could be imported without having any import license — on the domestic prices of goods including imports\(^{55}\).

In the wake of the Pakistan-India War of 1965 and subsequent reduced foreign economic assistance, the large-scale manufacturing sector grew at a lower rate of 10% per annum in the period 1965-70\(^{56}\). Consequently, Pakistan achieved an average annual growth rate of 6.7% in GDP during the period 1960-1970\(^{57}\). In 1969-70, poverty incidence declined to 46% in Pakistan\(^{58}\). In 1969-70, West Pakistan’s Per Capita GNP was Rs.504 in contrast to the East Pakistan’s Per Capita GNP of Rs.314 – indicating a widening of the regional economic disparity noted earlier as well as pointing to the failure of the economic growth in achieving the anticipated trickle-down effects of economic growth and the desirable patterns of balanced regional economic growth across all regions in Pakistan, which could have been achieved by simultaneously implementing growth policies and distributive policies of taxation and transfer payments.

1.2.1.4 The 1970s: Era of socialism and its aftermath

Against the background of growing economic disparity between West and East Pakistan, East Pakistan revolted against West Pakistan and emerged as a new

\(^{55}\) That is, an official list of items allowed to be freely imported without any requisite license [Hasan (1997) and Zaidi (2005)].

\(^{56}\) Hasan (1997).

\(^{57}\) Hasan (1997), Zaidi (2005), and Fasih-Uddin and Swati (2009).

\(^{58}\) Hasan (1997).
independent country (Bangladesh) on the global map in 1971\textsuperscript{59}. After this strategic debacle, the martial law authorities handed over the reign of the national government in the remaining territorial domain of Pakistan to the socialist Pakistan People’s Party, which instituted socialism amidst very difficult macroeconomic circumstances\textsuperscript{60}. For example, at that time, poverty incidence rose to 55\% in Pakistan in 1971-72\textsuperscript{61}, there was an increase in Pakistan’s import bill due to the October 1973 world oil price shock, a serious post-1973 global recession during 1974-77, failures of cotton crops in 1974-75, pest attacks on crops, and massive floods in 1973, 1974, and 1976-77\textsuperscript{62}. Pakistan experienced her history’s worst inflation in the period 1972-77 during which prices increased by 15\% per annum\textsuperscript{63}. During the period 1973-77, Pakistan’s annual average fiscal deficit/GDP ratio was

\textsuperscript{59} East Pakistan’s socialist party, Awami League, won the overall majority of the parliamentary seats of the entire Pakistan, and West Pakistan’s socialist political party, Pakistan People’s Party, won only the majority of the parliamentary seats belonging to West Pakistan in the military regime-sponsored general parliamentary elections in 1970 (Zaidi 2005). After the refusal of the then ruling military to hand over the reign of the Government of Pakistan to the victorious Awami League, Pakistan lost East Pakistan on 16 December 1971 in the wake of her military defeat in the war of independence launched by Awami League in East Pakistan in 1970. Due to the loss of East Pakistan, Pakistan suffered huge economic losses in the form of foregone opportunities for 50\% of West Pakistan’s goods previously directed to the former East Pakistan and in the form of foregone foreign exchange previously obtained from its prime exports of jute and tea – originating from East Pakistan [Lansford (2012), and Zaidi (2005)]. Yet, Pakistan doubled its foreign exchange earnings in just one fiscal year 1972-73 by means of devaluation of the Rupee – Pakistani currency note – by 120\% during May 1972 [Zaidi (2005) and Zakaria (2012)].

\textsuperscript{60} Socialism was instituted via the nationalization of private industries, banks, educational institutions and via implementation of socialist reforms in the land tenure system [Husain (1999), Zaidi (2005), and Hasan (1997)].

\textsuperscript{61} Hasan (1997).

\textsuperscript{62} Hasan (1997) and Zaidi (2005).

\textsuperscript{63} Hasan (1997).
Pakistan’s trade balance deficits were US$337 million in 1970-71 and US$1,184 million in 1976-77\textsuperscript{65}. A military coup d'état against the socialist regime occurred on 5 July 1977, and the martial law regime gradually implemented more liberal policies of denationalization, deregulation, and privatization in the post-5 July 1977 scenario\textsuperscript{66}. The interest payments on the public debt amounted to almost 1% of Pakistan’s GDP in the 1970s\textsuperscript{67}.

Against the above background of very high incidence of poverty in Pakistan, it is pertinent to note the existence of a positive relationship between the level of poverty and the rising debt servicing burden of interest payments on public debt in Pakistan amidst a debt crisis in light of the following argument of Kemal (2001, p. 267):

“Whenever a country is in debt crisis, a large proportion of public expenditure and the foreign exchange earnings are absorbed by debt servicing. Increasing debt servicing requirements in the absence of debt relief leaves the following three choices to the government of the debtor countries, viz., taxation of capital, taxation of consumption, and reduction in public expenditures. Each of these has significant implication for an increase in the poverty rates.”

\textsuperscript{64} High fiscal deficits were financed primarily by means of inflationary money creation in the 1970s.

\textsuperscript{65} Zaidi (2005)

\textsuperscript{66} Coup d'état occurred in the background of a significant decline in the popularity of the ruling socialist party caused by both the high inflation and the nationalization policy when the ruling socialist party won the general elections of 1977 with merely a simple majority amidst the opposition’s accusations that the general elections were rigged. Then, the leaders of the opposition launched an anti-socialist regime political movement, which culminated in Pakistan’s second military coup d'état. The martial law regime launched an effective program of realizing very high rates of economic growth via a massive inflow of both the foreign remittances and the foreign aid from the Western countries led by the USA in the wake of Soviet invasion of Afghanistan in 1979 [(Zaidi, 2005), (Lansford, 2012)].

\textsuperscript{67} Hasan (1997).
Pakistan registered an agricultural sector growth rate of 2.4% per annum and a large-scale manufacturing sector growth rate of 5.5% per annum in the 1970s. While the large and medium-scale private manufacturing units contributed 75% of the value-added and 70-80% of the total investment in the arena of manufacturing in the 1970s, the remainder of the 25% of the value-added (as well as 20-25% investment, 30% exports, and a large number of jobs) was contributed by the small-scale manufacturing sector.

1.2.1.5 The 1980s: Era of revival of economic growth

One of the hallmarks of the 1980s was the revitalization of both the investment climate for the private sector as well as private investment ventures as part of the process of reversal of the nationalization regime of the 1970s. Another hallmark of the 1980s was the revival of private sector’s industrial investment, which led to high rates of economic growth in the 1980s. Poverty incidence (poverty headcount ratio at national poverty line expressed as a percentage of population) declined to 29.1% in 1986-87. Unemployment rate declined from 3.7% in 1980 to 2.6% in 1990. During 1985-88, the Government of Pakistan tried to implement the Islamic interest-free banking system, which was based on the concept of sharing profits as well as

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68 Fasih-Uddin and Swati (2009).
69 World Bank (Undated).
70 Husain (1999) and Fasih-Uddin (2008).
71 Fasih-Uddin (2008).
72 Fasih-Uddin and Swati (2009).
losses. The government and the State Bank of Pakistan gradually promoted Islamic banking as a competitor of the conventional banking, introduced a number of Islamic modes of financing (for example, PLS deposits — bank deposits-based on profit and loss sharing), and established Mudaraba (a cooperative business partnership between entrepreneur and the owner/provider of capital based on the principle of sharing profits as well as losses) and leasing companies. Against the background of the persisting constitutional barriers in the way of the anticipated establishment of a fully-fledged Islamic banking as a viable Islamic alternative to the conventional banking in Pakistan, Islamic banking registered slow and steady progress and succeeded to ensure the establishment of private Islamic banks, their survival as well as resilience, and their branching out in several cities of Pakistan. Consequently, Islamic banking has succeeded in creating a prominent niche for itself in a highly competitive market for banking services in Pakistan. This reality is depicted in the following appraisal of the experiment of Islamic banking in Pakistan (Fasih-Uddin and Swati, 2009, p. 95):

“Despite the availability of a number of instruments consistent with Shari’ah like leasing, hire-purchase, profit and loss sharing instruments etc., lending continued to be dominated by mark up and interest. In compliance with the verdict of the Supreme Court Shari’ah Appellate Bench of 1999, a number of steps have been taken. The State Bank has adopted a Shari’ah compliance framework, set up a separate regulatory infrastructure along with an Islamic Banking Department to focus on all Islamic banking issues. (The State Bank is promoting Islamic banking as a parallel system as opposed to the recommendations of the Council of Islamic Ideology for having only one system of Islamic banking.) The Banking Companies Ordinance 1962 has also been amended and the State Bank has issued detailed guidelines for establishing Islamic commercial banks. Two Islamic banks and 62 Islamic banking branches have started operations. The total assets of Islamic banks

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Nafziger (2012).
have increased from Rs. 12.9 billion in June 2003 to Rs. 200.4 billion in March 2008. They contributed about 4% in bank assets and deposits in March 2008.”

Pakistan achieved a national savings/GDP ratio of 16% in 1986-87 amidst massive inflows of worker remittances from the Middle East. However, Pakistan continued to experience the problems of negative public savings and declining public investment/GDP ratio throughout the 1980s and used a large portion of the additional national savings to finance the enlarged fiscal deficits in the same period. Fiscal deficits were the result of both the steep growth in the public sector’s non-development expenditures – especially interest payments – since the 1980s, and the tendency of the tax revenue/GDP ratio to decline against the background of the failure of the federal government to mobilize the requisite tax revenues for financing defence and other non-development expenditures (for example, subsidies and expenditures on civil administration). For example, the Government of Pakistan’s tax revenue was 272.0 billion Rupees, total revenue was 344.8 billion Rupees, current expenditure was 376.3 billion Rupees, development expenditure was 128.3 billion Rupees, and fiscal deficit was 150.3 billion Rupees during 1985-90.

Pakistan financed her increasingly enlarged budget deficits in the early 1980s mainly via non-bank domestic borrowing (for example, national savings schemes), which postponed inflationary outcomes. Pakistan’s domestic debt grew from Rs.58

76 Hasan (1997).
77 Fasih-Uddin and Swati (2009).
79 Hasan (1997).
billion in mid-1981 to Rs.521 billion in 1988\textsuperscript{80}. Consequently, the public debt/GDP ratio was 77.1\% in 1988, 81.9\% in 1989, and 82.6\% in 1990\textsuperscript{81}. This explosion of the domestic debt resulted in large interest payments, public expenditure, and fiscal deficits\textsuperscript{82}. Democracy was restored in 1985\textsuperscript{83}. In the period 1980-1990, Pakistan’s average annual growth rate of GDP was 6.3\%\textsuperscript{84}. A manufacturing exports’ boom occurred in the 1980s, with an annual large scale manufacturing sector growth rate of 8.8\% per annum and an annual growth rate of 5.4\% in the agricultural sector\textsuperscript{85}.

1.2.1.6 The 1990s: Era of debt crisis

In the 1990s, Pakistan confronted the problems of declining worker remittances and rising external deficits\textsuperscript{86}. In the wake of declining growth rates of GDP, Pakistan experienced her history’s second worst inflation period in the 1990s\textsuperscript{87}. Unemployment rate initially sharply increased to 5.9\% in 1991 and then sharply rose

\textsuperscript{80} Hasan (1997).

\textsuperscript{81} Fasihuddin (2008).

\textsuperscript{82} Hasan (1997).

\textsuperscript{83} After both the dismissal of this democratic government by the President of Pakistan in 1988 and general elections of 1988, the newly formed government was dismissed in 1990. General elections of 1990 resulted in a new government. This scenario depicts higher political uncertainties, fast changing economic policies, and higher economic risks for investors (Lansford, 2012).


\textsuperscript{85} Hasan,(1997), Fasih-Uddin and Swati (2009).

\textsuperscript{86} Hasan (1997).

\textsuperscript{87} Prices grew at a rate of 12\% per annum from mid-1993 against a backdrop of explosive growth in money creation for supplying credit to the public sector, especially during the period 1990-96 (Hasan, 1997).
to 7.2% in 2000. Pakistan also financed the enlarged current account deficits via
the sustained increases in her residents' Foreign Currency Deposits (FCDs). FCDs
were based on the provision for anonymity of the source of the deposited sums and
were capped at a percentage that varied with the maturities of FCDs, above the
London Inter Bank Offer Rate. Another attractive feature of FCDs was that the
Government of Pakistan exempted both these deposits and the income stream
generated by these deposits from the payments of wealth tax, income tax, and Zakat
— an Islamic financial obligation. Adult literacy was 39.6% in 1994-95.

In 1995, Pakistan’s external debt amounted to US$30 billion – her external debt
tripled during the period 1980-1995. Accordingly, the external debt/GDP ratio
increased from 42% in 1980 to 50% in 1995, and the external debt/exports ratio
increased from 209% in 1980 to 258% in 1995. The period 1980-1995 was
caracterized by a sharp increase in the debt service ratio from 18% to 27%. Along
with the emergence of Pakistan’s seriously deteriorating profile of external liabilities
as the prime cause of her foreign exchange difficulties after the first half of 1996, her

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89 Hasan (1997).


91 Amidst this external debt fiasco, Pakistan met almost one-third of her foreign exchange gap via the
use of volatile short-term liabilities in the form of the resident and non-resident foreign currency
accounts (Hasan, 1997).

92 That is, principal and interest payments/foreign exchange earnings ratio (Hasan, 1997).
domestic debt dramatically rose to a level of Rs.909 billion, and the domestic debt/GDP ratio rose to 42%\textsuperscript{93}.

The burden of interest payments on the public debt also rose to almost 6 per cent of GNP in the mid-1990s, in addition to the constant burden of interest payments on external debt, amounting to 1.2% of GNP in the mid-1990s\textsuperscript{94}. Pakistan encountered a serious debt problem in the late 1990s, when the public debt/GDP ratio rose from 57.5% in 1975-77 to 102% in 1998-99\textsuperscript{95}. Similarly, the public debt/revenues ratio rose to 624% in 1998-99, interest payments/revenues ratio rose to 42.6%, and, therefore, the burden of the public debt became unsustainable\textsuperscript{96}. Thus, the likelihood of Pakistan’s external debt default initially emerged in 1996, and later in 1998, due to economic sanctions imposed by the Western countries in reaction to Pakistan’s multiple nuclear tests on 28 May 1998\textsuperscript{97}. These all-encompassing American and European economic sanctions triggered massive capital flight from Pakistan\textsuperscript{98}. This debt crisis occurred despite an agricultural sector growth rate of 4.4% per annum and a large-scale manufacturing sector growth rate of 4.8% per annum in the 1990s\textsuperscript{99}.

\textsuperscript{93} Hasan (1997).

\textsuperscript{94} Hasan (1997).

\textsuperscript{95} Debt overhang caused a decrease in the rate of investment to 15% of GDP in 1998-99/1999-2000. In the wake of this debt crisis, the third coup d’état empowered the third military regime on 12 October 1999 for the period 1999-2008. In spite of realization of some debt relief by Pakistan via her agreement with IMF regarding the rescheduling of her debt payments obligations, the possibility of her external debt default was not ruled out [(Hasan, 1999) and (Lansford, 2012)].

\textsuperscript{96} Hasan (1999).


\textsuperscript{98} Irfanul Haque (2010).

\textsuperscript{99} Fasih-Uddin and Swati (2009).
Poverty incidence (poverty headcount ratio) sharply increased to 30.6% in 1998-99\textsuperscript{100}.

1.2.1.7 The 2000s: Era of economic crisis

In 2001, the official Debt Reduction and Management Committee judged the increasingly high public debt as a major cause of the slowdown of the growth rate to less than 4 per cent per annum\textsuperscript{101}. Pakistan’s debt crisis of the 1990s was followed in the 2000s by an era of numerous macroeconomic crises\textsuperscript{102} – in spite of gradual improvement in the growth rate until 2004-05 when the growth rate was 8.6%, the subsequent years were characterized by economic growth slowdown and low growth along with high inflation, energy crisis, and deterioration in both the fiscal position and the balance of payments position of Pakistan\textsuperscript{103}. Again, poverty incidence (poverty headcount ratio) initially sharply increased to 34.5% in 2000-01 and then sharply decreased to 22.3% in 2005-06\textsuperscript{104}. Unemployment rate initially increased to

\textsuperscript{100} Fasih-Uddin and Swati (2009).

\textsuperscript{101} Pakistan’s debt entrapped her in a vicious circle of high debt servicing, which caused stagnation in investment and growth as well as limited her capacity of debt servicing (Debt Reduction and Management Committee, 2001).

\textsuperscript{102} Namely, a dire deterioration in the balance-of-payments position in 2001, a reduced average annual economic growth rate of 2%, a negative trade balance alongside the signing of IMF’s standby agreement with an exceptionally tough conditionality amidst the looming prospect of default on external debt during 1998-2001, the failure of public and private sectors to effectively use the inflows of US$62.2 billion realized during the period 2002-2007 as a result of the increased strategic significance of Pakistan in the post-9/11 scenario for establishing a robust basis for sustainable growth, the sharp deterioration in Pakistan’s international investment position after the fiscal year 2005, a rise in the fiscal deficit/GDP ratio to 4.3% in the fiscal year 2000, the increasing conspicuous consumption, and a steep hike in the import bill in the fiscal year 2008, which caused unsustainable trade deficits [(Irfan-ul-Haque, 2010) and (Zakaria, 2012)].

\textsuperscript{103} Fasih-Uddin and Swati (2009).

\textsuperscript{104} Fasih-Uddin and Swati (2009).
7.8% in 2002 and then sharply declined to 5% in 2008\textsuperscript{105}. Adult literacy was 55% in 
2007-08. Pakistan experienced a fully-fledged economic crisis in 2008\textsuperscript{106} as well as 
the prime effect of global financial crisis in 2009-10\textsuperscript{107}. In 2009-2010, the inflation-
adjusted economic growth rate of Pakistan was a respectable 4.1%, the agricultural 
sector growth rate was 2%, industrial output growth rate was 4.9%, large-scale 
manufacturing sector growth rate was 4.4%, and the services sector growth rate was 
4.6%\textsuperscript{108}. In March 2010, the total public debt of Pakistan amounted to Rs.8,160 
billion with a total public debt/GDP ratio of 56%, while the foreign-currency 
denominated debt/GDP ratio was 25%\textsuperscript{109}.

1.2.2 An overall snapshot of the Pakistan economy

The above macroeconomic history confirms that Pakistan has had fluctuating growth 
rates of real GDP, agriculture, industry, and services, as shown in Figures 1.1, 1.2, 
1.3 and 1.4, which measure, respectively, the growth rates of real GDP, agriculture, 
industry and services on the vertical axis and indicate years on the horizontal axis\textsuperscript{110}:

\textsuperscript{105} World Bank (2012), \textit{World development indicators 2012}.
\textsuperscript{106} 2008 was the year of transition from the military regime into a democratically elected Government of Pakistan.
\textsuperscript{107} Irfan-ul-Haque (2010).
\textsuperscript{108} Ministry of Finance, Government of Pakistan (2010).
\textsuperscript{109} Ministry of Finance, Government of Pakistan (2010).
\textsuperscript{110} Hasan (1997) and Naqvi (2007).
Figure 1.1

Real GDP Growth Rate (%)


Figure 1.2

Real Agriculture Growth Rate (%)

The troughs and peaks in the above graphs of the four growth rates signify the weaknesses and strengths of the economy of Pakistan at different points in time. As can be seen in Figure 1.1, the first as well as the worst trough of the entire real GDP growth history of Pakistan occurred during 1951-52. It was due to the Korean War-driven set back of falling world prices of Pakistan’s major exports of cotton as well
as jute, and declining export revenues and profits, which had substantial adverse effects not only on the industrialization process but also on the growth rates of real GDP, agriculture, industry, and the services. These sector-level adverse growth effects are observed at various times during the first half of the 1950s, as seen in Figures 1.2, 1.3, and 1.4, respectively.

Here it is pertinent to note that 1951’s 3% growth rate of real GDP deteriorated to -1.9% in 1952 due to the fall in world market prices of cotton and jute, and the resultant deterioration of the balance of payments caused by the Korean War. The Korean War boom that enabled Pakistan to realize her history’s exceptionally highest 10.2% growth rate of real GDP in 1954, as shown in Figure 1.1, was due to the overvalued exchange rate, and pro-imports-substituting industrialization policies of simultaneously promoting agricultural goods’ production, to be used as industrial inputs, as well as keeping the prices of agricultural inputs of industrial production at quite low levels. These policies boosted profits of industrialists and accelerated industrialization as a result of the massive domestic investment of massive profits earned by Pakistani traders from their cotton and jute exports during the Korean War. This exceptional economic growth was achieved by the contributions of agriculture, industry, and services, which achieved real growth rates of 15.2%, 12.10%, and 3.6%, respectively, in 1954 as shown in Figures 1.2, 1.3, and 1.4.

Later, Pakistan realized reasonably high annual real GDP growth rates varying from 5.5% to 9.8% in 28 fiscal years during the period 1955-2010, as shown in Figure 1.1. This was primarily due to inflows of the massive external aid/debt during almost
decade-long stable undemocratic martial law regimes\textsuperscript{111}. In contrast, shorter and less external aid/debt-recipient democratic regimes generally achieved lower real GDP growth rates than those achieved by martial law regimes. With few exceptions, annual real GDP growth rates varied from 5.5% to 10.2% in 29 fiscal years during the period 1951-2010, as shown in Figure 1.1. Average annual real GDP growth rate was 3% for the 1950s, 6.7% for the 1960s, 4.8% for the 1970s, 6.1% for the 1980s, 4.4% for the 1990s and 5.6% for the period 1999-2007\textsuperscript{112}. The overall average annual real GDP growth rate was 5.12% for the period 1951-2010\textsuperscript{113}. While the general long-term trend for the growth rate of real GDP is upward, as seen in Figure 1.1, this long-term upward trend is dominated by wider fluctuations around it. This upward trend is more pronounced during the period 1951-1970 than during the later period.

In general, fluctuations in the growth rates of real GDP have also been caused by a combination of factors such as discoveries of more efficient production techniques and inputs of production, such as the use of high yield varieties of rice seeds. Also important were revolutionary systemic changes of policy regimes under the influence of competing global ideologies, fluctuations in foreign aid inflows, the fast-growing external debt as well as the external debt servicing burden, and political stability of long martial law regimes as well as political instability associated with the frequent

\textsuperscript{111} State Bank of Pakistan (2010) and Zaidi (2005).

\textsuperscript{112} Fasih-Uddin and Swati (2009).

\textsuperscript{113} State Bank of Pakistan (2010)
dismissal of democratic governments. The scarcity of water, recurrent electricity crises, cotton crop failures, and floods were also contributing factors\textsuperscript{114}.

However, the highly vulnerable foreign capital-dependent Pakistan economy has been practically addicted to foreign capital (foreign aid, external debt, overseas Pakistanis’ remittances, and Pakistani residents’ foreign currency deposits)\textsuperscript{115}. Therefore, the upward and downward fluctuations in inflows of foreign aid consisting of external debt as well as grants, fast growth in external debt service burden, and variations in overseas Pakistanis’ remittances have been the prime causes of fluctuations in the growth rate of real GDP of Pakistan\textsuperscript{116}. This point of view is backed up with the empirical facts of the severely hit economic growth performance of Pakistan due to disrupted foreign aid during both the second half of the 1960s and the 1990s. Simultaneously, the economic growth performance of Pakistan was severely hit due to the decline in the inflows of overseas Pakistanis’ remittances from the then stagnating oil exporting countries of the Middle East amidst the Gulf War of the 1990s\textsuperscript{117}. In addition, the excessive external debt service burden of at least US$5.2 billion amidst the imposition of crippling Western economic sanctions, as well as the precautionary policy regime of freezing the Pakistani residents’ foreign currency accounts in the aftermath of Pakistan’s May 1998 nuclear tests, also played their part.

\textsuperscript{114} Zaidi (2005) and Hussain (2003)
\textsuperscript{115} Husain (1999).
\textsuperscript{116} Zaidi (2005).
\textsuperscript{117} Husain (1999).
With the exception of Pakistan’s highest real growth rate of agriculture (15.2%) in 1954, the real growth rate of agriculture remained either negative (for example, -9.1% in 1952) or low until 1960, due to the general official neglect of the imperative of developing the agricultural sector. Later, the agriculture sector received greater attention and the reasonably high annual real growth rates of agriculture varied from 5.0% to 11.7% in 18 fiscal years during the period 1955-2010\textsuperscript{118}. This increase was due to significant improvements in irrigation facilities, land reforms, better planning, promotion of high yield varieties of wheat and rice seeds, and the provision of loans and subsidies to the agricultural sector since the advent of the first martial law regime in Pakistan\textsuperscript{119}. In the post-1970 era, the occasional low or negative real growth rates of agriculture have been occurring partly due to intermittent disastrous floods, water-logging and salinity of agricultural land, acute shortages of water and electricity, insufficient dams and deteriorating irrigational infrastructure. Average annual real growth rate of agriculture was 1.6% for the 1950s, 5.1% for the 1960s, 2.4% for the 1970s, 5.4% for the 1980s, 4.4% for the 1990s and 2.8% for the period 1999-2007\textsuperscript{120}. The overall average annual real growth rate of agriculture was 3.43% for the period 1951-2010\textsuperscript{121}. While the general long-term trend for the annual real agriculture growth rate is upward, as seen in Figure 1.2, this long-term upward trend is less pronounced and is dominated by fluctuations around it.

\textsuperscript{118} State Bank of Pakistan (2010).

\textsuperscript{119} Zaidi (2005) and State Bank of Pakistan (2010),

\textsuperscript{120} Fasih-Uddin and Swati (2009).

\textsuperscript{121} State Bank of Pakistan (2010).
It is evident that industrialization has received the highest priority and patronage from the Government of Pakistan. Therefore, the government launched fast-track industrialization programs of imports-substituting industrialization and export promotion\textsuperscript{122}. These programs were financed through the inflows of massive external aid/debt especially during the almost decade-long martial law regimes\textsuperscript{123}. Under these programs, the Government of Pakistan has been providing industrialists with tax concessions (facilities of tax-free industrial zones), subsidies and export bonus schemes\textsuperscript{124}. The Government has also been protecting the Pakistani industries from foreign competition by means of tariffs and ensuring the availability of cheap agricultural inputs for industrial production. In this context, the Government has been officially setting the prices of agricultural goods at artificially low levels\textsuperscript{125}. Consequently, Pakistan often achieved reasonably high annual real growth rates\textsuperscript{126} for industry varying from 5.1% to 18% in 35 fiscal years during the period 1955-2010, as shown in Figure 1.3. In contrast, all three negative real growth rates of industry in Pakistan were experienced only during the democratic regimes (-1.5% in 1972 when Pakistan People’s Party ruled Pakistan after the territorial-cum-economic loss of East Pakistan in 1971, -0.30% in 1997 when Pakistan Muslim League ruled Pakistan, and -1.9% in 2009 when Pakistan People’s Party ruled Pakistan)\textsuperscript{127}. While

\textsuperscript{122} Husain (1999), Hussain (2003), and Zaidi (2005).
\textsuperscript{123} Hussain (2003) and Husain (1999).
\textsuperscript{124} Zaidi (2005).
\textsuperscript{125} Husain (1999) and Zaidi (2005).
\textsuperscript{126} State Bank of Pakistan (2010).
\textsuperscript{127} State Bank of Pakistan (2010).
the above negative growth rate of industry in 1972 was partly due to both the territorial-cum-economic loss of East Pakistan in 1971 and the recessionary effect of the 1972 devaluation-triggered increase in the cost of imported raw materials and industrial equipment, the negative growth rate of industry in 1997 was partly due to the seriously deteriorated national profile of external debt liabilities in 1996. In this context, it is pertinent to note the following argument of Hasan (1997, pp. 358-9):

“The slowdown of growth during 1970-75 was due in part to the separation of East Pakistan, oil price shocks, poor weather conditions, and technological problems which delayed the availability of Tarbela Dam waters.”

One plausible explanation of Pakistan’s aforementioned negative growth rate of industry partly caused by the loss of East Pakistan is the fact that the foregone foreign exchange earnings associated with the jute exports of East Pakistan, which were previously controversially transferred to the industrialists of West Pakistan, were no more available for investment in the remaining Pakistan after the establishment of Bangladesh in 1971. This explanation is based on the following argument of Khan (2002, p. 19):

“Industrialization was encouraged in West Pakistan while East Pakistan remained an exporter of jute. The transfer of foreign exchange, earned mainly by the jute exports from East Pakistan, to the industrialists in West Pakistan became an important source of the interregional conflict.”

Moreover, the negative annual real growth rate of industry in 2009 was partly due to both Pakistan’s own economic crisis and the prime effect of the global financial crisis experienced in Pakistan in 2009. Average annual real growth rate of industry

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128 Fasih-Uddin and Swati (2009).
(defined as manufacturing sector) was 7.7% for the 1950s, 9.9% for the 1960s, 5.5% for the 1970s, 8.2% for the 1980s, 4.8% for the 1990s and 9% for the period 1999-2007\textsuperscript{129}. The overall average annual real growth rate of industry was 7.16\% for the period 1951-2010\textsuperscript{130}. While the general long-term trend for the annual real industry growth rate is downward, as seen in Figure 1.3, this long-term downward trend is dominated by fluctuations around it. This downward trend is more pronounced during the period 1980-2010 than during the earlier period.

According to Pakistan Statistical Year Book 2011, the services sector output share of transport, storage, and communication was 24.5\%, the services sector output share of wholesale and retail trade was 32.9\%, the services sector output share of finance and insurance was 8.14\%, the services sector output share of ownership of dwellings was 4.6\%, the services sector output share of public administration and defence was 10.1\%, and the services sector output share of social, community and other services was 19.8\% in the fiscal year 2009-10. As a by-product of the above industrial growth, Pakistan also achieved reasonably high annual real services’ growth rates, varying from 5.0\% to 14.4\% in 33 fiscal years during the 45-year period 1955-2010, due to the same factors above which caused high industrial growth in Pakistan, as shown in Figure 1.4\textsuperscript{131}. In contrast, Figure 1.4 implies that the number of the low real growth rates of services Pakistan achieved during less external aid/debt-recipient democratic regimes, was generally larger than the number of low real growth rates of

\textsuperscript{129} Fasih-Uddin and Swati (2009).

\textsuperscript{130} State Bank of Pakistan (2010)

\textsuperscript{131} State Bank of Pakistan (2010).
services Pakistan achieved during the excessive external aid/debt-recipient martial
law regimes, because of the martial law governments’ decade-long effective policies
of accelerating the growth of both the industries and services, as shown in Figure 1.4.
Average annual real growth rate of services’ output was 3.61% for the 1950s\textsuperscript{132}.
Similarly, the average annual real growth rate of services’ output was 6.7% for the
1960s, 6.3% for the 1970s, 6.7% % for the 1980s, 4.6% for the 1990s and 6.2% for
the period 1999-2007\textsuperscript{133}. The overall average annual real growth rate of services’
output was 5.49% for the period 1951-2010\textsuperscript{134}. While the general long-term trend for
the annual real services growth rate is upward, as seen in Figure 1.4, this long-term
upward trend is dominated by fluctuations around it. This downward trend is more
pronounced during the period 1951-85 than during the later period.

Associated with the aforementioned adverse aggregate and sector-level growth
effects, the set-back due to the Korean War is the only significant trough in the graph
of real GDP observed during the first half of the 1950s, as shown in Figure 1.5 which
measures respectively the real GDP in millions of Rupees on the vertical axis, and
shows years on the horizontal axis.

\textsuperscript{132} Kemal et al. (2002).
\textsuperscript{133} Fasih-Uddin and Swati (2009).
\textsuperscript{134} State Bank of Pakistan (2010)
The real GDP series exhibits a very smooth upward general long-term trend, as seen in Figure 1.5, displaying a number of cyclical fluctuations around it. This upward trend has steepened significantly in the 2000s. In spite of certain visible minor cyclical oscillations in the graph of real GDP in Figure 1.5 corresponding to cyclical oscillations in the graph of real GDP growth rate in Figure 1.1 (for example, stagnation of real GDP and the corresponding decline in real GDP growth rate in the early 1950s), the general long-term upward trend for real GDP in Figure 1.5 complies with the general upward long-term trend for the growth rate of real GDP in Figure 1.1.

Pakistan experienced slow growth in real GDP generally, coupled with a fast-growing population. The population increased from 30 million in 1947 to 124.45 million in 1994, and to 166.52 million in 2010. Against this background, Pakistan’s real per capita income, measured at constant factor cost, increased from 351 Rupees
in 1950 to 35,219 Rupees in 2010, as shown in Figure 1.6, which measures real per capita income in Rupees on the vertical axis and shows years on the horizontal axis.

**Figure 1.6**

![Graph showing real per capita income](Image)


The general long-term trend for Pakistan’s real per capita income is upward, as seen in Figure 1.6. Pakistan has experienced a transition from its previous status of a low-income developing country to its current status of a lower middle-income developing country.

Amidst the above growth dynamics, the Pakistan economy has, since its early years, been experiencing gradual structural transformation in the form of changes in its sectoral compositions, as shown in Figure 1.7, which measures GDP shares of agriculture, industry and services on the vertical axis, and shows years on the horizontal axis.
This structural transition included a sharp decline in GDP share of agriculture from 53% of GDP in 1947 to 21.2% of GDP in 2010, a sharp increase in the GDP share of industry from at least 9.6% of the GDP in 1949-50 to 25.4% of GDP in 2010, and a dramatic increase in the GDP share of the services from less than 37.2% of GDP in 1950 to 53.4% of GDP in 2010\textsuperscript{135}. The general long-term trend for GDP shares of agriculture is downward, as seen in Figure 1.7, and is characterized by cyclical fluctuations. In contrast, the general long-term trends for GDP shares of industry and services are upward, as seen in Figure 1.7, and are characterized by cyclical fluctuations.

1.3 Conclusions

Pakistan experienced a 1998 external debt crisis – a culmination of the process of Pakistan’s fast accumulation of external debt since the 1980s and the aftermath of

\textsuperscript{135} State Bank of Pakistan (2010) and Fasih-Uddin and Swati (2009).
economic and financial crises. A brief history of the Pakistan economy portrayed the nature, causes, and economic effects of the 1998 external debt crisis for Pakistan. Amidst her persistent budget as well as balance of payments deficits, Pakistan has been experiencing the problems of an external debt crisis, which culminated in a fully-fledged economic crisis characterized by low rates of economic growth and debt overhang.

The economic history of Pakistan also highlighted the key role played by the manufacturing sector, which has been effectively backed up with support of the agriculture and services’ sectors, in actually bringing about a remarkable structural change in the economy. While confronting the challenging problems of poverty, unemployment, inflation, energy crisis and debt crisis during her past sixty-five years of existence, Pakistan progressed from its status as a low-income to a lower middle-income developing country. Growth enabled Pakistan to achieve her policy objective of poverty reduction. This brief history confirms that the Pakistan economy is capable of realizing high rates of the growth of real GDP under a regime of responsible policies and in the absence of debt crises. However, to achieve high rates of sustainable economic growth, it is important for Pakistan to not only significantly increase the national saving rate and the national investment rate but also to try and achieve budget surpluses – via the effective implementation of economic austerity measures for minimizing her domestic and external debt.

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137 World Bank (2011).

burden\textsuperscript{139}. For sustainable growth, Pakistan also needs to have political stability to promote a healthy investment climate for domestic and foreign investors and high levels of investment in human capital. The economy needs to be more open to international trade and private foreign investment\textsuperscript{140}, which in turn will drive growth.

\textsuperscript{139} Rosen (2002).

\textsuperscript{140} Papanek (1996).
Chapter 2

Literature review of external debt crises

2.1 Introduction

Debt crises have been an issue for numerous countries since the 1820s. Currently, several countries of the first world, the Euro zone, and the third world, including Pakistan, are experiencing a debt crisis in general, and external debt crisis in particular.

This chapter presents a literature review of these crises with particular reference to Pakistan. This literature review will cover the causes, macroeconomic effects and remedies of the past debt crises, both for Pakistan in particular, and for the other indebted countries in general. For Pakistan, this literature review will concentrate on the external debt crises of the 1990s because the external debt crisis has been the focus of attention of Pakistan’s policy makers and economists since the 1990s, when Pakistan’s external debt grew at unprecedented massive rate due to which the burden of debt servicing and its adverse macroeconomic effect in the form of external debt overhang became unaffordable and the most worrisome problems for the Government of Pakistan\(^1\). Against this background, a substantial sum of Pakistan’s external debt was rescheduled\(^2\). It was also due to the above external debt crisis that

\(^1\) Ishfaq and Chaudhary (1999) and Siddiqui and Siddiqui (2001).

the establishment of Pakistan appointed a former Vice President of the World Bank Moeenuddin Ahmad Qureshi as the Interim Prime Minister of Pakistan for the period 18 July–19 October 1993, a former Vice President of the World Bank Shahid Javed Burki as the interim Finance Minister of Pakistan (de facto) for the period 11 November–17 February 1997, and an Executive Vice President of Citibank Shaukat Aziz initially as Pakistan’s finance minister for the period 6 November 1999–20 August 2004 and finally as the Prime Minister of Pakistan for the period 20 August 2004–5 November 2007 especially for alleviating Pakistan’s ongoing external debt crisis.

In the literature on debt crises, there are two points of view about the prospective effects of public debt (defined as the sum of all past budget deficits and the external debt). The first point of view portrays public debt as a potential source of economic growth in cases where the marginal return on investment of loans is greater than the marginal cost of loans\(^3\). This point of view has some empirical support in the literature (for instance, Khan and Rahim (1993), Khan (1996), Siddiqui and Malik (2001), Wijeweera, Dollery and Pathberiya (2005), Fasih-Uddin and Sawati (2009), Benmelech and Dvir (2011), Abdul-Wahab and Ahmed (2011), and Nafziger (2012)). This point of view is pertinent to the present study as well. The second point of view asserts that moderate levels of public debt, used for investment instead of consumption, augment economic growth and that high public debt slows economic growth when the funds are used for current consumption/corruption/unproductive or

\(^3\) Rosen (2002).

Following the line of reasoning of the second view, which is premised in Lerner’s view — which was the dominant view in the 1940s and the 1950s —, according to which the internal debt is not a burden for the future generations as a whole and the external debt used for current consumption is a burden for the future generations⁵, the literature on Pakistan’s debt crisis implies that external debt in general and the external debt servicing in particular have become an obstacle to the growth of the economy, because fluctuations in external debt have been causing fluctuations in the growth rate⁶.

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⁵Rosen (2000).
⁶Despite the positive correlation between capital inflows and growth rates and a period of political stability in the 1960s, a drop in external debt in the form of foreign aid was followed by a drop in the growth rate of Pakistan in the second half of the 1960s. The external debt crisis hindered economic growth via its impacts on both cuts in development expenditure and excessive indirect taxation (for
2.2 Literature review

Keynes pioneered the idea that a government needed to deliberately implement a policy of financing its planned deficits. Some literature has duly acknowledged the real world phenomenon of the growth-augmenting role of the external debt – via its impact in the form of equal reductions in both the savings gap and the foreign exchange gap. In this context, the literature noted the assertion of the neoclassical growth model that the perfect mobility of capital boosts economic growth.

Similarly, Rosen (2002) also recognized the public sector’s fiscal deficits, domestic debt, and external debt as a potential source of economic growth in the case of marginal returns on investment of loans being greater than the marginal cost of loans. This point of view is further reinforced by Gill and Pinto’s (2005) theoretical perception that sovereign debt helps a government achieve growth, via investment in both the requisite critical mass of infrastructure and the social sector, in a scenario of limited tax revenue. Despite these arguments in favour of debt and external debt, numerous recent empirical analyses of the widespread debt crises in general and external debt crises of several countries in particular have increasingly led policy-

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8 For example, Nafziger (2012) and Chenery and Strout (1966).

makers to be sceptical about the validity of the growth-augmenting role of debt in general, and external debt in particular\textsuperscript{10}.

In light of the existing controversy regarding the prospective role of budget deficits in causing economic growth as well as a debt crisis, there have been a number of conflicting points of views on budget deficits in the literature. The Keynesians argue that planned budget deficits are good, the neo-classicals argue that budget deficits are bad, and the Ricardians argue that the budget deficits are irrelevant\textsuperscript{11}. Adding to this debate is the point of view of new political economy, according to which inefficiently high levels of budget deficits are explained by the inherent deficit bias of fiscal policy\textsuperscript{12}.

In this scenario, the World Bank and the IMF have regarded the fiscal deficit as the mother of all ills, especially in the majority of developing countries. In this milieu, it is not surprising that not only the governments of developing countries like Pakistan, but also the contemporary governments of the developed countries (for instance, Australia, the United Kingdom and the USA) are resorting to policies of dramatically reducing their public spending to reduce their planned budgetary deficits, as well as sovereign external debt and are trying to eventually achieve budgetary surpluses for alleviating the severity of their national sovereign debt.

\textsuperscript{10} For instance, Dijkstra and Hermes (2003), Gill and Pinto (2005), Nafziger (2012), and Todaro and Smith (2009).

\textsuperscript{11} For instance, Romer (2001), Rosen (2002), and Bilquees (2003).

\textsuperscript{12} Romer (2001)
While the existing literature on the debt crises is quite extensive, a selective review of literature on the worldwide debt crises of several countries constitutes the subject matter of this chapter.

Some of the earliest and the more recent literature highlighted the occurrence of numerous debt crises in the history of several developing and developed countries since the 1820s. This literature highlights the centuries-old history of the widespread sovereign debt defaults of numerous nations.

Keynes (1924) concisely summed up the centuries-old pervasive phenomena of sovereign external debt crises in the following words:

“There is on the part of most foreign countries, a strong tendency to default on the occasions of wars and revolution and whenever the expectation of further loans no longer exceeds in amount the interest payable on the old ones... Defaults, in fact, are worldwide and frequent. The Southern States of U.S.A, Mexico, all Central America, most of South America, China, Turkey, Egypt, Greece, the whole of the Balkans, Russia, Austria, Hungary, Spain, and Portugal have all defaulted in whole or in part at one time or another.”

It is indeed ironic that after acknowledging widespread sovereign debt defaults in 1924, later Keynes pioneered the aforementioned idea of planned deficit financing. Here it is pertinent to note that the economic history of several nations has confirmed the irony of the conflicting macroeconomic outcomes of the implementation of Keynes’s policy recommendation of deliberately financing national deficits. On one hand, the validity of Keynes’s policy recommendation of deficit financing for a sagging economy was effectively established by the global recovery in the aftermath

13 For instance, Keynes (1924), Fishlow (1989), Sachs (1989), and Nafziger (2012).

14 (Keynes (1924, p, 277).
of the Great Depression in the 1930s. On the other hand, the actual implementation of deficit financing, especially in the last three decades of the 20th century, culminated not only in a morass of debt crises, sagging economies, and chronic recession in numerous countries of both the first world and the third world, but also contributed to the global recession in 2007 and the global financial crisis in 2008.

The most recent, contemporary episodes of sovereign debt crises have been experienced by Eurozone countries (Greece, Ireland, and Portugal) due to demand side factors such as fiscal indiscipline and excessive deficit financing arising from excessive current public expenditures. While acknowledging the lack of consensus on the specific causes of the contemporary debt crises of the Eurozone countries (Greece, Ireland, Portugal, etc.), Sawicki (2011) observed that the prime cause of the debt-laden Eurozone countries’ sovereign debt crises was their welfare state policy framework having a highly generous social safety-net program.

In the literature, applied econometric analyses [for example, Fishlow (1989) and Sachs (1989)] as well as general, descriptive empirical analyses provided great insights into the occurrence of numerous debt crises in the history of many countries. In the wake of the fast growth of external debt of especially the less-developed countries during 1970-1999, there is a lot of literature on the burning issue of nations’ sovereign debt crises in general, and external debt crises in particular since the 1970s.

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15 Sawicki (2011).
16 For instance, Nafziger (2012), and Todaro and Smith (2009).
17 This fact is evidenced by Nafziger (2012).
Numerous authors explained the occurrence of debt crises in the developing countries as an aftermath of the international lending explosion triggered by the first-ever major oil price hike launched by the Organization of Petroleum Exporting Countries (OPEC) — a supply side factor which triggered the aforementioned debt crises in the developing countries, and the subsequent world recession during the period 1974-1979\textsuperscript{18}. In addition, some authors discovered that the debt crisis of the 1980s was primarily caused by the unexpected increase in interest rates and by the declining export volumes and export prices\textsuperscript{19}. The literature also acknowledged the lack of access to credit, decreased export capacity, the collapse of prices of primary goods, over-valued national currencies, appreciation of the debt denominated in US dollars and substantial flight of capital, as well as large debt and low investment as amongst the other important causes of the debt crisis of developing countries\textsuperscript{20}.

Unsustainable levels of external debt and debt servicing – a hallmark of the early 1980s – are regarded as a cause of unsustainable economic growth. Against the background of the culmination of the long-standing internal and external imbalances of the heavily-indebted countries in unsustainably high levels of their external debt and debt servicing in the early 1980s, IMF (1987) emphasized the inevitability of their tasks of reducing the absorption in order to meet the short-run shortage of foreign exchange and adjusting the non-interest current account for reducing external debt and debt servicing to manageable levels. These tasks were accomplished via the

\textsuperscript{18} For example, IMF (1987), Cunningham (1993), Dijkstra and Hermes (2003), Nafziger (2012), and Todaro and Smith (2009).

\textsuperscript{19} For instance, Dijkstra and Hermes (2003), and Nafziger (2012).

\textsuperscript{20} For instance, Nafziger (2012).
policies of financing the increasing internal and external deficits, reducing the
government’s non-interest expenditures, and increasing the revenues of the
government\textsuperscript{21}. The author diagnosed that the heavily-indebted countries experienced
simultaneous increases in both their external debt and fiscal deficits, which in turn
culminated in an inflationary surge\textsuperscript{22}. While the then national policies of improving
the fiscal situation via increases in income and wealth taxes also culminated in capital
flight, the author discovered the inability of the high-debt countries to sustain their
economic growth performance because of the crowding-out of private investment, the
sharply reduced gross capital formation, and the reduced public investment.

While acknowledging the world interest rate hike of the early 1980s as a cause of the
debt crises of several countries, Berge and Sachs (1988) analysed the effects of the
size of the debt burden (debt/exports ratio) amidst the debt crises of several countries.
The authors presented a concise review of literature on the probability models of the
rescheduling of the external debt. The authors contributed two fundamental
statistical models of rescheduling of the external debt. The first model capturing the
beginning of a debt crisis is a cross-section probit model of debt rescheduling. The
second model is a tobit model of debt rescheduling, which regards the secondary
market value of the external debt of a country as a measure of her creditworthiness.

There has been some discussion on the issue of an exclusive reliance on rescheduling
of the external debt as a policy response. Sachs (1989) analysed the debt crisis of the
1930s, when nearly all Latin American countries confronted the debt crisis via a

\textsuperscript{21} IMF (1987).

\textsuperscript{22} IMF (1987).
unilateral moratorium on their debt repayments. The author also compared the debt crisis of the 1930s with the debt crisis of the 1980s (this debt crisis commenced in 1982) wherein nearly all the indebted countries continued their debt servicing, which precluded the possibility of an international banking crisis. Sachs asserted that the lack of recovery of the aforementioned countries from the debt crisis was partly due to strategic error of the creditor governments and international institutions in the form of their exclusive reliance on rescheduling of their respective debts, as well as on new lending for getting the debtor countries out of their debt crises. The author characterized the debt rescheduling as an inadequate policy response for the heavily burdened indebted developing countries, and confirmed that several indebted countries had been liquidated through capital flight, little domestic investment, and a power struggle among the creditor countries. The author recommended a debt management program consisting of a combination of both a strategy of debt forgiveness of the highly overburdened debtor countries, and a debt rescheduling strategy for managing the sovereign debt crises of the developing countries.

Historically, both domestic and external factors have caused sovereign external debt crises. Fishlow (1989) compared the experiences of Argentina and Brazil during the 1890s and the 1980s, and found that they initially experienced booms in the 1880s (a result of rising domestic investment, spectacular growth in primary exports, migration, and extraordinary inflow of British capital that was used for construction

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23 This unilateral moratorium on their debt repayments was resolved after the end of the Second World War (Sachs, 1989).
of railways and other types of infrastructure\textsuperscript{24} and, finally, the debt crises as well as major economic downturns in the 1890s. The author explained the 1890s’ debt crisis, and noted that the failure of Brazil to obtain a foreign loan in 1897, when debt servicing absorbed a quarter of the total receipts of the federal government, led her to default. Nevertheless, the author suggested that the debt crisis in Brazil was provoked by both internal factors (expansionary domestic policy) and external factors (foreign capital inflows).

Cuddington (1990) presented a comprehensive review of the literature on the nature, extent, causes, and dynamics of the global external debt crisis of the 1980s, since its origin in August 1982, amidst the significantly distorted price systems, especially due to the then prevalent policy regimes of over-valued exchange rates and inward-looking international trade in the debt ridden developing countries. The author presented detailed empirical analyses of especially the nature, extent and predictability of the debt servicing difficulties, as well as trends and dynamics of external debt against the historical background of global macroeconomic environment characterized by oil price shocks, wide fluctuation in real GDP growth, inflation as well as disinflation, capital flight, and alleged over-borrowing during the 1970s. The author concluded that the bad policies of both the creditors and debtor countries were also among the numerous causes of the global external debt crisis of the 1980s, and emphasized the pressing imperative of launching new policy

\textsuperscript{24} During the period 1886-90, £63 millions were received by Argentina and £24 million were received by Brazil (Fishlow, 1989).
initiatives on the part of both the official financial institutions and the global community.

The literature on the excessive external debt of developing countries has also documented an interesting debate on the appropriateness of two alternative strategies of coping with debt overhang, debt write-off and debt rescheduling. Cohen (1990) highlighted the discrepancy between the market and face values of external debt and the debt overhang problem (that is, the external debt servicing becomes a tax on the resources of the indebted country). This situation, which is called the debt Laffer curve problem, involves the possible zero return on debt for creditors in both the scenarios of debt being zero and infinity, as well as inefficiency of debt rescheduling, as two sources of inefficiency arising from excessive external debt. The author’s theoretical and empirical analyses advocate the use of a generalized buy-back scheme of efficient debt rescheduling, which prices the debt service at market value of the debt (that is, creditor counts one dollar of the debt service accomplished by the debtor as being equal to two dollars of the debt service in the case of the market value of debt being 50%) to cope with the debt overhang.

The history of the numerous external debt crises of current and past centuries provides us with important insights into both the lessons and remedies of external debt crises. Eichengreen and Ports (1990) analysed the interwar external debt crises and explained the processes of lending during the 1920s, external debt defaults during the 1930s, readjustment of the debt during the 1940s and 1950s, and the external debt crises during the 1980s, when desperate national debt servicing efforts culminated in slow economic growth for almost a decade. While highlighting the
practical impossibility of any world-level plan of resolving external debt crises, the authors found that the controversial market-based reductions in external debt (for example, buy-backs of bonds in the market at significantly below par prices) did help resolve the interwar external debt crises.

In the literature, equity financing has also been duly acknowledged as a potential source of economic growth. Klein (1991) perceived the then persisting debt problems of developing countries as a by-product of the process of the recycling of the surplus oil revenues (petro-dollars) in the 1970s, when oil importing countries such as Brazil as well as oil exporting developing countries such as Mexico and Venezuela, were severely hit amidst a global recession. According to the author, the aforementioned countries’ debt problems had been a hindrance to the economic growth for a period of more than eight years because their capital outflows in the form of their debt servicing were greater than their capital inflows. The author emphatically recommended that developing countries improve their economic growth by means of various forms of equity financing.

In spite of the emergence of both foreign direct investment (FDI) as a pillar of private financial flows in the developing countries and the optimism about replacement of the lending of private banks by FDI, Nunnenkamp (1991) expected several heavily-indebted countries to become constrained in terms of private lending and FDI inflows. While highlighting that the eruption of the debt crises of 1982 had destroyed the risk illusions, the author speculated that foreign investors would shy away from the countries characterized by an increasing sovereign risk, and that the default on sovereign debt obligations was a matter of capital recipient countries’ willingness and
ability to service the external liabilities. In light of his empirical results of the pooled cross-country regressions for the 1980s, the author concluded that both the debt overhang and the sovereign risk were, indeed, relevant explanatory variables, which were capable of explaining the FDI inflows of developing countries in the 1980s.

The literature also points to the adverse effects of the heavy national indebtedness on the national productivity of capital and labour and, thereby, on the national economic growth. Cunningham (1993) highlighted the well-accepted fact of the negative relationship between the debt burden and the economic growth of the heavily-indebted countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Ivory Coast, Jamaica, Mexico, Nigeria, Peru, Philippines, Venezuela, and Yugoslavia). The author analysed the relationship between economic growth and external debt by treating the debt servicing burden (DS) as a primary factor of production along with other factors of production (capital stock and labour force) within the framework of the standard production model.\(^{25}\) His empirical results confirmed the existence of the significant adverse effects of the heavy indebtedness

\(^{25}\) Cunningham (1993) recommended the inclusion of external debt servicing in the specification of the production function, as follows (Cunningham, 1993, pp. 117-118):

\[
GDP = B_0 + B_1DS + B_2K + B_3L + \mu
\]

This regression equation is used for testing the possibility of the existence of a long-run relationship between \(GDP\) – as a surrogate of economic growth – and its three explanatory variables – Debt Servicing burden (\(DS\)), Capital (\(K\)), and Labour (\(L\)). Here, it is hypothesized that external debt servicing has a negative effect on economic growth (Cunningham, 1993).
of a country on the productivity of both capital and labour and, thereby, on the
economic growth.

There have been several empirical contributions on default functions, determinants of
debt rescheduling, and two-gap analysis. Meier (1995) presented a very concise
review of the literature not only on ‘effects of aid’, ‘econometric default functions’,
determinants of debt rescheduling’, and ‘two-gap analysis’ but also on the growth-
related implications and theoretical formulations of two-gap analysis.

The deficit/debt-growth nexus has been a controversial issue in the literature because
persistent budget deficits may reduce growth. Romer (2001) defined crisis as a
situation involving a sharp contraction in fiscal policy, a large decrease in aggregate
demand, major repercussions in both the capital markets and the foreign-exchange
markets, and the possibility of a default on the part of the government in the context
of paying back the loans incurred by it. The author highlighted a widespread
perception that large, persistent budget deficits not only reduce growth but also
culminate in a crisis of some type. He also noted that inefficiently high levels of
budget deficits may be explained, not only by the inherent deficit bias of fiscal policy
because of which countries pursue an unsustainable policy of always raising the
debt/GDP ratio, but also by the fact that the costs of budget deficits, such as the cost
of inflation, are poorly understood.

An external debt burden may culminate into bankruptcy, collapse of growth, and
exacerbation of poverty. Mundell (2001) analysed the nature of relationships among
debt, growth, poverty, and the international monetary system and demonstrated, that
the debt crises of the 1980s and the 1990s confirmed the practical possibilities of adverse effects of foreign borrowing, such as bankruptcy, collapse of growth, and exacerbation of poverty.\(^{26}\)

The literature also highlights the current issue of the volatility of the debt service payments of the heavily-indebted countries. Dijkstra and Hermes (2003) observed that indebted countries failed to service their debts during the decades of the 1880s, the 1930s, the 1980s, and the 1990s. The authors defined sustainable debt as a debt which a country can service without adversely impacting the possibilities of long-run economic growth. The authors identified the possibility of defining the sustainable debt\(^{27}\) as a debt which a country can service without adversely affecting “human development” or “international human rights”. They traced the origin of the increasing indebtedness of developing countries to the oil price hike of 1973, when the oil exporting countries deposited their surplus petrodollars in the developed

\(^{26}\) Mundell stated (Mundell, 2001, p. 283):

“Poverty needs growth; growth needs new technology and foreign capital; and foreign borrowing increases indebtedness, which leads to the possibility of bankruptcy, collapse of growth, and an exacerbation of poverty. That it is a real threat is confirmed by the debt and financial crisis of the 1980s and 1990s, which continues into the present time.”

\(^{27}\) Theoretically, the debt service is sustainable in the long-run in case of the satisfaction of the following equality (Dijkstra and Hermes, 2003, p. 6):

\[
\frac{D}{X} = \frac{a}{(g_x - i)}
\]

Here \(D\) signifies debt, \(X\) signifies exports, \(M\) signifies imports, \(a\) signifies the trade gap = \(M - X\), \(g_x\) signifies the growth rate of exports, and \(i\) signifies the average interest rate on the debt.

The above equation implies that in the case of the growth rate of exports being greater than the average interest rate, sustainable debt/exports ratio can accompany a trade gap ‘\(a\)’ financed via an increase in the debt, and that in the case of the growth rate of GNP being less than the average interest rate, the resulting solvency problems make it inevitable for the country to not only stop its practice of contracting new loans, but also to ensure the continuity of a trade surplus for servicing its debt and these inevitable steps may adversely impact the economic growth of the country (Dijkstra and Hermes, 2003, p. 6).
countries’ commercial banks which, in turn, recklessly lent colossal sums of petrodollars to developing countries with trade deficits in the 1970s. The authors found that the debt crisis of the 1980s was also caused by both the unanticipated increase in interest rates and the decline in developing countries’ export volumes, as well as export prices emanating from the oil price-driven deep world recession, that culminated in a fully-fledged debt crisis in developing countries, and noted that the concerted lending was regarded as a solution to the debt crisis in the early 1980s. The authors also empirically demonstrated that there was a negative relation between debt service/GDP ratio and economic growth only in the 1990s, and that the volatility of the debt service payments of the heavily-indebted countries was due to the high levels of their external debt. They pointed to the possibility of accelerating economic growth by reducing the volatility in their debt service payments via a reduction in their respective levels of debt.

Questions about the true nature of a causal relationship between economic growth and external debt merit a rigorous empirical response. In this context, Wijeweera, Dollery and Pathberiya (2005) wrote a review of pioneering empirical literature on debt overhang. On the basis of a cointegration analysis in the case of Sri Lanka for the period 1952-2002, the authors concluded that the external debt had not been a significant obstacle to Sri Lanka’ economic growth in that period because it was not large enough to result in a debt overhang crisis.

28 Before 1970, the developing countries had been borrowing mainly either from the governments of the developed countries or from the international financial institutions (Dijkstra and Hermes, 2003).
External debt crises can be understood in light of basic transfers. Todaro and Smith (2009) portrayed the accumulation of external debt in developing countries as a widespread phenomenon since the early 1970s (for instance, the overall external debt of developing countries more than doubled during the period 1975-1979). The authors acknowledged the fundamental importance of the concept of basic transfers for understanding the origin and consequences of the debt crisis, and regarded developing countries’ highly negative values of the basic transfer – reflecting the loss of foreign exchange in the form of net capital outflow – during the 1980s as another manifestation of the debt crises of the developing countries. The authors viewed Mexico\textsuperscript{29} as the first country to experience a debt crisis but successfully resolved it via a dramatic reduction in external debt and restoring her modest economic growth.

The external debt crisis of one country may have adverse spill-over effects for other countries. Stein (2010) mentioned the debt crises of the less-developed countries as a partial cause of the overall 40% decline in foreign demand for the agricultural output of the United States during the period 1981-1986, which resulted in the agricultural crisis of the USA during the 1980s.

While the contemporary contagious sovereign debt crises of the Euro-zone seem to be endless, Candelon and Palm (2010) affirmed that the relative lack of empirical studies on the mutation of the banking crisis into the sovereign debt crises is primarily due to the difficulties encountered in the processes of both conceiving the operational definitions of the debt crises and identifying the timing, as well as the

\textsuperscript{29} Mexico triggered a debt crisis by announcing her inability to service her debt in August 1987 and her prospective moratorium on debt payments to the private creditors for at least three months (Todaro and Smith, 2009, p. 684).
duration of the debt crises. The authors presented a brief literature review on the
linkages between the banking and debt crises in Europe. They used the balance sheet
approach for depicting the prospective linkages between the banking crises and debt
crises, and contributed a graphical analysis for confirming the potential for the
occurrence of sovereign debt crises in Europe in the future. The authors did not rule
out the possibilities of future contagious currency and sovereign debt crises in the
Euro area.

Benmelech and Dvir (2011) presented a brief literature review on whether short-term
debt is a symptom or a cause of a financial crisis, and carried out an empirical inquiry
in the aforementioned two possible roles of short-term debt in the 1997-1998
financial crisis of many East Asian countries, which had primarily financed their fast
economic growth by means of short-term debt prior to a crisis. The authors
confirmed the endogeneity of the short-term debt by means of the long-term debt,
which matured amidst the financial crisis, and concluded that the short-term debt had
been merely a symptom of the financial crisis.

Historically, there have been multiple causes for the external debt and financial crises
of the numerous countries. Nafziger (2012) has authored a very brief overall review
of the literature on the external debt and financial crises of the numerous countries.
The author listed global shocks, the lack of access to credit, decreased export
capacity, collapse of the prices of primary goods, over-valued national currencies,
appreciation of the debt denominated in US dollars, poor macroeconomic
management, over-valued national currencies and substantial flight of capital from
foreign assistance, debt, and investment, amongst the important causes of the debt
crises of less-developed countries (LDCs). The author noticed a persistent phenomenon of negative net transfers\(^{30}\) caused by the substantial debt servicing\(^{31}\) of developing countries in general during 1986-1988, and found that LDCs’ external debt dramatically grew from a sum greater than US$1 trillion in the late 1980s to US$2.3 trillion during 2001. The author highlighted the empirical facts that the unsustainably high average debt-service ratio of Argentina was 67% at the beginning of the 21\(^{st}\) century, that Argentina defaulted, and that later Argentina’s external debt was rescheduled as well. The author also characterized Pakistan as one of the major less developed debtor countries.

### 2.2.1 The external debt crisis of Pakistan

Several economists have contributed descriptive and empirical analyses on Pakistan’s external debt crisis\(^{32}\). Some of the empirical literature on Pakistan’s external debt crisis highlighted the historical record of the dramatic growth in Pakistan’s absolute external debt burden from US$24 million in 1954-55 to US$29.8 billion in 1997-98, which led Pakistan ultimately to turn to the IMF in January 1999\(^{33}\). It pointed to the occurrence of a large increase in her external debt during the 1992/93 to 1998/99 fiscal years, accompanied by a sharp increase in the short-term external debt and

\(^{30}\)Net transfers refer to international resource flows – in the forms of grants, loans, and investment – minus net international payments of interest and profit remittances (Nafziger, 2012).

\(^{31}\)Debt servicing is defined as the payments of both the principal and interest in the context of long-term debt (Nafziger, 2012).


\(^{33}\) For example, Tahir (1998), Anwar (2002), and Fan (2007).
medium-term external debt as a percentage of total external debt from 10.7% in the 1990/91 fiscal year to 22.1% at the end of 1998. The above dramatic growth in Pakistan’s external debt occurred as a result of her severe balance of payments crisis. A number of authors also referred to the World Bank’s characterisation of Pakistan as the only severely indebted country in the South Asian region in 2001\textsuperscript{34}.

Other empirical literature on Pakistan’s and other developing countries’ debt crises pointed out that the unsustainable high levels of external debt as well as debt servicing and the resulting serious macroeconomic problems (the debt overhang, significant adverse effect on investment and economic growth, recession, and unemployment) led to the rationale for the policy imperatives of increasing national saving rate and implementing the requisite structural reforms in the fiscal system\textsuperscript{35}. These reforms were designed to lead to significant reductions in fiscal deficits, domestic debt, and external debt via the sustained increases in public revenues and the sustained cut in public expenditures.

The literature also points to the deficit financing as a noted cause of macroeconomic instability. In the wake of the fiscal deficits at the forefront of the macroeconomic adjustment campaign during the 1990s, Easterly and Schmidt-Hebbel (1991) presented a brief review of the literature on the question of sustainability of the fiscal deficits of the public sector and summarized the results of their case studies of ten

\textsuperscript{34} For instance, Siddiqui and Siddiqui (2001), and Fan (2007).

\textsuperscript{35} For example, Cunningham (1993), Hasan (1999), Kemal (2001), Zaman (2001), and Dijkstra and Hermes (2003).
countries, including Pakistan, according to which stable, low fiscal deficits produced good economic growth performance. The authors observed that the fiscal deterioration of Pakistan raised her primary deficits over and above the level of 1.7% of the GDP – a level compatible with the stable debt/output ratio.

Of course, the significance of an empirical inquiry into the actual macroeconomic effects of the termination of the inflow of foreign economic assistance received by Pakistan is self-evident for all stakeholders. Khilji and Zampelli (1991) presented an empirical analysis of the prospective adverse effects of both the Gulf Crisis of the 1990 and the termination of US assistance for Pakistan (for example, rising unemployment, balance of payments difficulties, and decline in economic growth). The authors concluded that a reduction in US assistance would reduce public expenditures, and, thereby, would result in a greater reduction in private consumption expenditure, private investment expenditure, the national standard of living, and private capital formation.

Naturally, the aid-dependent growth strategy has important practical implications for national savings and investment and for the self-reliance of an aid-recipient country such as Pakistan. Kemal (1992) contributed a concise review of the literature explaining the failure of Pakistan’s aid-dependent strategies to achieve self-reliance. The author empirically determined a human resource development/productivity growth-based self-reliance growth strategy, which would achieve the doubling of GDP per capita within 18 years by raising the marginal saving rate to 34% in the case of the growth rate being equal to 7% and the capital/output ratio being equal to 3.4 while, at the same time, precluding the necessity of borrowing for financing
investment. On the basis of his empirical finding of a significant negative relationship between Pakistan’s private savings and foreign capital inflows, the author concluded that Pakistan’s foreign aid-dependent growth strategy failed to achieve both higher savings and investment and, therefore, self-reliance because the inflows of foreign capital adversely affected Government of Pakistan’s efforts in the context of increasing her national savings as it did not feel the need for increasing national savings due to the availability of foreign aid. Consequently, Pakistan can never achieve the requisite sufficient level of savings to finance her desired level of investment\textsuperscript{36}.

Current account deficits had been one of several external shocks for Pakistan during the period 1978-90. Sarmad (1992) reviewed the literature on impacts of external shocks on current account deficits of developing countries, and identified large current account deficits, and the swelling burden of external debt as distinguishing aspects of Pakistan’s economy during the 1970s and 1980s. Moreover, the author discerned that the increase in inflows of remittances caused the current account deficit to improve significantly during 1978-81, and that the current account deficit deteriorated due to the decrease in inflow of remittances in the period 1987-90.

The literature has also highlighted the empirical evidence of the distinct effects of the grants-based foreign aid and the loans-based foreign aid on public investment. Chishti and Aynul-Hasan (1992) recognised that foreign loan inflows into developing countries have been used for public investment in the long-term development

\textsuperscript{36} Kemal (1992).
schemes of developing countries. The authors analysed the effect of foreign aid inflows, in the forms of grants and loans, on public consumption and public investment in Pakistan for the period 1971-1988, and concluded that almost 28% of the domestic borrowing was used for financing the non-development expenditures of the government, that the foreign aid inflows in the form of grants had a modest effect on public investment, and that foreign aid in the form of loans did not have a significant effect on public investment.

Moreover, the literature has highlighted a variety of effects of foreign aid on Pakistan’s economic growth. Khan and Rahim (1993) highlighted the prospective positive impact of foreign aid on economic growth, via the positive impact of foreign aid on both the investible resources and domestic investment, as one of the core principles of the theory of foreign aid. The authors concluded that the results of their empirical analysis did not suggest the presence of a negative effect of foreign aid on economic growth in the case of Pakistan, and that different types of foreign aid had different effects on economic growth.

The literature also includes empirical analysis of the nature of relationships among the fiscal deficits, money supply and inflation in Pakistan. While pointing to the persistence of alarming budget deficits during the 1970s and the 1980s, Chaudhary and Ahmad (1995) carried out a literature review on the nature of the relationship among fiscal deficits, money supply and inflation in Pakistan’s economy, and quoted several empirical studies depicting inflation as a monetary phenomenon in Pakistan in contrast to other empirical observations that inflation was caused by the structural factors. On the basis of the empirical results of their study, the authors concluded
that there has been a positive relationship between the fiscal deficits and inflation during the 1970s and, further, that Pakistan’s money supply has been endogenously determined by international reserves and fiscal deficits.

The issue of the real crowding-out of private investment in Pakistan’s large-scale manufacturing sector arising from fiscal deficits has also been empirically analysed. Looney (1995) provided a critical review of both the theoretical literature and the Pakistan-specific empirical literature on real crowding-out, as well as financial crowding-out, arising from fiscal deficits in the framework of macroeconomic theories of conventional crowding-out, Keynesian crowding-out, and a monetary approach to a country’s balance of payments. On the basis of the empirical results of his study, the author concluded that non-infrastructure public sector investment (for example, public investment in public enterprises such as Pakistan Railways and Pakistan Steel Mills Corporation), in Pakistan’s case, caused real crowding-out of private investment in large-scale manufacturing.

The literature includes empirical research contributions on the current issue of economic reforms for increasing the rate of national savings and, thereby, achieving growth in productivity in Pakistan. Ahmad (1996) viewed both domestic debt and external debt as the sources of Pakistan’s debt and the debt crisis in the form of her severe resource constraints. In the context of solving Pakistan’s debt problem, the author disapproved of the policy-makers’ common approach of only resorting to various policy measures such as seeking short-run relief (for instance, their general practice of rolling-over the existing debt). Instead, a sustainable solution to the debt crisis was proposed in the form of raising the rate of national savings via economic
reforms aiming at growth in productivity. His empirical results did not support the policy of selling public sector assets to foreigners as the desired results of the aforementioned policy, the reduced primary fiscal deficit and the corresponding reduction in domestic borrowing and external debt, could be better realized by selling the assets to domestic buyers. This argument is premised in the author’s assertion that domestic buyers of public assets are expected to continue to save and reinvest their profits at a higher rate in Pakistan, thereby boosting the factor productivity as well as accelerating the rate of growth in Pakistan.

The Pakistan economy is highly vulnerable to the volatility of capital flows and the corresponding risks such as the reversal of capital flows. Khan (1996) authored a broad literature review on the characteristics, internal and external causes, macroeconomic effects, and policy implications of large-scale private capital flows (workers’ remittances, foreign currency deposits, portfolio investment, and FDI) to developing countries during the 1990s. The author identified the external factors – cyclical and structural factors – as the significant causes of surge in capital flows to developing countries during the 1990s. The author drew attention to the macroeconomic effects – such as the acceleration of the investment rate and growth rates in several capital recipient developing countries – of the aforementioned surge in capital flows to developing countries. Moreover, the author pointed to the volatility of capital flows and the corresponding risks such as the risk of reversal of capital flows, which could in turn reverse the actual benefits\(^{37}\) of foreign capital

\(^{37}\) That is, actual positive contributions of foreign capital inflows toward financing growing current account deficits, reducing the need for external debt to finance the current account deficits, achieving overall balance of payments surpluses and accumulation of foreign exchange reserves, alleviating the external debt crisis, and accelerating growth by increasing investment.
inflows realized by Pakistan in the first half of the 1990s and, thereby, increase the role of external debt in financing current account deficits as well as increase both external debt and total public debt.

Historically, Pakistan has faced a serious structural problem of living beyond her means for a very long time. Papanek (1996) endorsed the then existing widespread perception that Pakistan was at the brink of an imminent short-run foreign exchange crisis for the purpose of meeting her debt obligations and other liabilities. The author diagnosed Pakistan’s serious chronic long-term structural imbalance of living beyond her means since her independence in 1947. He proposed a solution to the aforementioned structural problem in the form of a policy recommendation of attracting the requisite private foreign investment for generating sufficient income to service the external debt, pay profits to the foreign investors, accelerate the growth of output and exports, accumulate large foreign exchange reserves, and realize a more competitive environment.

Generally, Pakistan’s domestic saving rate had been very low\textsuperscript{38}. Burki (1996) perceived fiscal deficits as Pakistan’s most important problem, and noted that the problem had been practically addressed by the Government via two approaches. The first approach was to borrow funds from the market, which crowded-out the private entrepreneurs and, thereby, caused the negative effects on Pakistan’s economic growth. The second approach was to print money, which created regressive inflation and inflation tax. The author argued that Pakistan’s domestic saving rate had been at

\textsuperscript{38} For example, Pakistan’s domestic savings/GDP ratio was 16\% in sharp contrast to India’s domestic savings/GDP ratio of 22\%, Thailand’s domestic savings/GDP ratio of 36\%, and Korea’s 36 domestic savings/GDP ratio of 36\% (Burki, 1996).
a very low level due to both the poor state of public finance and the poor performance of the financial sector, which were direct outcomes of the massive nationalization of private banks and the politicization of the banking sector.

A number of research contributions have been published about the occasional rescheduling of Pakistan’s external debt. Tahir (1998) analyzed the history of accumulation of Pakistan’s debt burden and demonstrated that the absolute external debt burden sharply increased from US$24 million in 1954-55 to US$29.8 billion in 1997-98. The author highlighted the fact that Pakistan’s debt rescheduling was a consequence of the rapid accumulation of arrears of external debt in the post-sanctions period. On the basis of his own calculations of the degree of Pakistan’s indebtedness in terms of four debt burden indicators (debt/GNP ratio, debt/foreign exchange earnings ratio, debt service/foreign exchange earnings ratio, and interest payments/foreign exchange earnings ratio), the author characterized Pakistan as a moderately-indebted low-income country.

The possibility of the external debt default on the part of the Government of Pakistan has been continuously looming on the economic horizons of Pakistan. Hasan (1999) highlighted the six-fold growth in Pakistan’s public debt during the period 1977-78. The author argued that later the public debt burden of the Government of Pakistan became unsustainable relative to the size of the economy in the late 1990s, when the public debt/GDP ratio increased from 57.5% in 1975-77 to 102% in 1998-99.

Figures 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6 present a graphical illustration of the evolution of Pakistan’s debt crisis during the period 1984/85-1998/99 on the basis of the author’s reported set of data on Pakistan’s domestic debt in billions of Rupees,
domestic debt/GDP ratio (%), external debt in billions of Rupees, external debt/GDP ratio (%), total debt in billions of Rupees, and the total debt/GDP ratio (%) which are measured along the vertical axis, with years shown along the horizontal axis:

Figure 2.1 Domestic Debt (Billion Rupees)

Data Source: State Bank of Pakistan annual reports & IMF international finance statistics

Figure 2.2 Domestic Debt/GDP Ratio (%)

Data Source: State Bank of Pakistan annual reports & IMF international finance statistics
Figure 2.3 External Debt (Billion Rupees)

Data Source: *State Bank of Pakistan annual reports & IMF international finance statistics*

Figure 2.4 External Debt/GDP Ratio (%)

Data Source: *State Bank of Pakistan annual reports & IMF international finance statistics*
Figure 2.5 Total Debt (Billion Rupees)

Data Source:  *State Bank of Pakistan annual reports &
*IMF international finance statistics

Figure 2.6 Total Debt/GDP Ratio (%)

Data Source:  *State Bank of Pakistan annual reports &
*IMF international finance statistics

Figure 2.1 above portrays domestic debt continuously rising during the period 1985-1999. Figure 2.1 shows that the domestic debt dramatically increased from 143.9 billion Rupees in the fiscal year 1984/85 to 1389.3 billion Rupees in the fiscal year
1998/99, thereby implying an over nine-fold increase in domestic debt within a period of fifteen years. It depicts a steeper increase in domestic debt during the 1990s in contrast to the 1980s, as well as the steepest increase in domestic debt especially during the period 1997/98-1998/99, which was indeed the period of debt crisis of Pakistan.

Figure 2.2 above portrays that the domestic debt/GDP ratio first steeply increased from 30.5% in 1984/85 to 43.2% in 1986/87, then fluctuated downward and upward before being reduced to 41.7% in 1997/98, and finally increasing steeply to 47.7% during the debt crisis period 1997/98-1998/99.

Figure 2.3 above portrays that the external debt slowly increased from 140.2 billion Rupees in 1984/85 to 436.3 billion Rupees in 1990/91, remained constant at 436.3 billion Rupees during the period 1990/91-1991/92, gradually increased to 785.1 billion Rupees in 1994/95, and finally increasing steeply during the debt crisis period 1994/95-1998/99 to 1581.9 billion Rupees in the specific year of the external debt crisis, 1998/99. According to Figure 2.3, overall, there occurred an over eleven-fold increase in domestic debt within a period of fifteen years.

Figure 2.4 above portrays that the external debt/GDP ratio initially steeply increased from 29.7% in 1984/85 to 36.4% in 1986/87, then fluctuated downward and upward before rising to 46.9% in 1996/97, and finally increasing steeply during the period 1996/97-1998/99 before rising to 54.3% in the specific year of the external debt crisis, 1998/99.

Figure 2.5 above portrays that the total debt had been continuously rising during the period 1985-1999. The total debt dramatically increased from 284.1 billion Rupees
in the fiscal year 1998/99 to 2971.2 billion Rupees in the fiscal year 1998/99, thereby implying an over ten-fold increase in total debt within a period of fifteen years. Figure 2.5 depicts steeper increase in total debt generally during the period 1993-1999 than the increase in total debt during the period 1984-1992.

Figure 2.6 above portrays that the total debt/GDP ratio first steeply increased from 60.2% in 1984/85 to 79.6% in 1986/87, then fluctuated downward and upward before steeply rising to 92.2% in 1993/94, and later fluctuated downward and upward before steeply rising to 90.2% in 1996/97, 91.2% in 1997/98, and 102% in the year of the external debt crisis, 1998/99.

The author portrayed Pakistan’s debt crisis of Pakistan and the recession triggered by her debt crisis of the 1990s and its adverse effects on her growth, in the following words (Hasan, 1999, p. 445):

“What are the factors, which explain the persistence, indeed the deepening of the debt problem notwithstanding sharp cutbacks in public spending and the relatively high inflation of the 1990s? (It is not widely realized that total public spending (excluding interest) actually declined from 20.4% to 15.0% over the period, the biggest cut being absorbed by development spending which declined from 6.5 to 3.4 per cent of GDP.)…. The biggest element in the worsening of the key indices of debt burden was the slowdown in the growth of revenue. Real revenues, which expanded 9% annually … showed zero growth during 1996-99. …To some extent, the sharply slower growth in revenues in the 1990s reflects the general slowdown in the economy. The slower GDP growth in turn reflects serious neglect of investment in human and physical capital.”

The author found that Pakistan’s development spending and the prospects of economic growth were adversely affected by both the very high public debt/revenue ratio (624%) and the interest payments/revenues ratio (42.6%) in 1998-99, and noted
the culmination of the actual scenario of debt overhang\textsuperscript{39} in a decline in Pakistan’s investment rate to 15% of the GDP of Pakistan in 1998-99 as well as in 1999-2000. Amidst this scenario, the author also found Pakistan confronting the likelihood of external debt default, initially in 1996 and later in 1998, when Pakistan technically defaulted in the arena of external debt. This was primarily due to the economic sanctions imposed by the West in reaction to formal multiple nuclear tests carried out by Pakistan\textsuperscript{40}. The author’s portrayal of Pakistan’s debt crisis is similar to the already mentioned Romer’s characterization of a crisis.

The literature implies that the burdens of both interest payments and debt servicing have become excessive for Pakistan. Ishfaq and Chaudhary (1999) discovered the origin of the occurrence of Pakistan’s debt crisis in the actual transformation of her surplus revenue account in a deficit revenue account in 1984-85, after which the fiscal deficit as well as debt began growing at multiple rates (for instance, the overall fiscal deficit increased by 66% from Rs. 68.2 billion in 1990-91 to Rs.148 billion in 1997-98). The authors found that growth in both the internal borrowing and the external borrowing had been triggered by the persistence of high levels of fiscal deficits over several years since 1990, when Pakistan’s annual fiscal deficit of over 6% of GDP continued. The authors noted that Pakistan landed in a debt trap because of her persistently high fiscal deficits. Moreover, they pointed out several adverse

\textsuperscript{39} Debt overhang refers to a scenario in which a country’s debt payments become linked to its economic growth and, therefore, the economic gains of economic growth are inevitably expended on the repayments of debt – such a debt overhang phenomenon is also called a foreign tax on the domestic production of a country (Wijeweera, Dollery and Pathberiya, 2005).

\textsuperscript{40} Hasan (1999).
The macroeconomic consequences of the contemporary debt crisis in Pakistan. The authors asserted that the first devastating consequence of Pakistan’s debt crisis had been the continuous, rapid growth in the burdens of both interest payments and debt servicing, which had already made both the debt and the debt servicing unaffordable. Their economic analysis of fiscal deficits and debt – being the mutual cause and effect – highlighted the inherently intertwined fiscal deficits and debt as the basic causes of the high rates of inflation in Pakistan.

There has been an empirical analysis of the long-run effect of the budget deficit on the current account deficit in Pakistan. Aqeel and Nishat (2000) wrote a short review of recent theoretical and empirical literature on the nature of the relationship between the budget deficit and the current account deficit and discovered mixed results. Some of the literature supported the view that the trade deficit had not been affected by the budget deficit, and some of the other literature found empirical evidence in favour of the view that the trade deficit had been caused by the budget deficit. The authors contended that the steady budget deficits – ranging from 5.47% to 8.7% – have been the primary cause of all of Pakistan’s major ills. By using the approaches of cointegration, error-correction, and Granger trivariate causality testing, the authors found a negative short-run causal relationship between the budget deficit and the current account balance, as well as a significant positive long-run effect of the budget deficit on the trade deficit in Pakistan.

Aqeel and Nishat (2000).
The Government of Pakistan has been well aware of the serious nature of her debt crisis.\textsuperscript{42} The Debt Reduction and Management Committee of the Government of Pakistan (2001) acknowledged that the public debt had been fast accumulating due to the persistently large fiscal deficits of the decades of the 1980s and the 1990s, amidst both the downward rigidity of budgetary expenditures and the lack of buoyancy of public revenues. The Committee also acknowledged the effect of the large current account deficits in the form of accumulation of unsustainable external debt, amidst stagnating exports, increasing imports, and decreasing remittances and other transfers. The authors also recognised that the financing of Pakistan’s current account deficits as well as investment, which had been non-productive especially in the 1990s, by means of borrowed foreign resources resulted in the accumulation of an excessively large external debt, which was too large to service. The authors diagnosed that Pakistan’s debt crisis was propelled by the unsustainable levels of her current account deficits amidst the substantial slowdown of the growth in exports and remittances in the period 1990/91-1994/95, and their stagnation in the second half of the 1990s. In this scenario, the authors discovered Pakistan entrapped in a debt crisis characterised by the continuously growing burden of debt servicing, which has been leading to both stagnating investment and growth\textsuperscript{43}. This stagnating investment, in turn, has been limiting the Pakistan economy’s capacity to both service and reduce the debt\textsuperscript{44}. The authors also found that the persistently low rate of national savings –

\textsuperscript{42} Debt Reduction and Management Committee of the Government of Pakistan (2001).

\textsuperscript{43} Pakistan economic growth rate sharply declined from over 6% in the 1980s to less than 4% in the 1990s (Debt Reduction and Management Committee of the Government of Pakistan, 2001).

\textsuperscript{44} Debt Reduction and Management Committee of the Government of Pakistan (2001).
ranging from 2.0% in 1949-50 to 15.0% in 1997-98 – as well as the increasing negative public sector’s savings had been the fundamental causes of both the economic problems and the debt crisis of Pakistan. The authors noted that Pakistan’s external payments had also been directly affecting the exchange rate and, thereby, the Rupee value of the public debt and external debt.

The literature has identified various adverse outcomes of the debt crisis in Pakistan. While explaining the nature of Pakistan’s contemporary debt crisis, Kemal (2001) also presented a comprehensive literature review on Pakistan’s 1990s debt crisis and its adverse implications for economic growth and poverty in Pakistan. The author concisely illustrated the various adverse outcomes of Pakistan’s debt crisis in the following words (Kemal, 2001, p. 263):

“Rising levels of debt and debt servicing, falling rates of investment, declining growth rates of output, and employment, and sharp increase in poverty sum up the disappointing performance of Pakistan’s economy over the last decade.”

The author identified corruption and improper use of loans as important causes of Pakistan’ debt crisis. The author contended that a direct result of the debt crisis of a country is that large shares of public expenditures as well as the foreign exchange earnings of the indebted country had to be absorbed by debt servicing. The absence of debt relief amidst the debt crisis of a country pointed to the availability of only three significantly regressive policy options for satisfing the increasing debt servicing requirements, namely, imposition of capital tax, imposition of consumption tax, and reduction in public spending, as reported by the author. The author reported the outcomes of Pakistan’s debt crises, namely, a decline in public development
expenditures from 6.9% of GDP to 2.7% of GDP, due to absorption of a large share of public sector’s budgetary resources by debt servicing, and a rise in poverty as a result of the policy of broadening the net of regressive sales tax in Pakistan.

Pakistan’s external debt has been rescheduled several times. Siddiqui and Siddiqui (2001) reported a short review of literature on the importance of political considerations (security and strategic interests of regionally vulnerable governments) and economic factors (for instance, achievement of the worldwide efficiency of resources use), as determinants of both the accumulation and rescheduling of sovereign debt. The authors noted that Pakistan’s debt had been rescheduled many times since the first rescheduling in 1971-72 in anticipation of the prospective relief of Pakistan’s external debt problem. The authors also observed that Pakistan’s GDP growth rate exhibited an increasing trend during periods of debt rescheduling in the 1970s and the 1980s, as well as during periods of increasing net transfers in the 1990s. Moreover, the authors discovered that high debt servicing not only hindered the development initiative but also culminated in a marked increase in the internal as well as external indebtedness of Pakistan. Against this background, their empirical analysis reflects that the economic-cum-financial ratios (debt service/exports ratio, debt service/gross national product ratio, and international reserves/external debt ratio) have been significant as well as robust determinants of the probability of rescheduling of debt in Pakistan.

Pakistan’s external debt crisis has been a burning macroeconomic issue meriting serious official attention and response. Hussain (2003) characterized the debt problem, involving a critical level of the debt servicing burden, as the key element of
Pakistan’s financial and economic crises (a deep, protracted recession experienced by Pakistan during the 1990s). In this context, the author noted that the debt servicing exhausted 60.3% of Pakistan’s public revenue. Therefore, the author viewed Pakistan’s external debt ($US35 billion in 2000) as a serious problem.

The above literature highlighted excessive interest payments/debt servicing and inflation, low savings rate, volatility of capital flows, corruption and improper use of loans, excessive public expenditure, poverty, unemployment and declining growth, stagnating exports, downward rigidity of budgetary expenditures and the lack of buoyancy of public revenues, and political and national strategic (that is, defense) factors as the determinants of both the accumulation and rescheduling of sovereign debt as Pakistan’s serious central macroeconomic structural problems, which warrant systemic structural macroeconomic reforms as a solution to Pakistan’s external debt crisis.

The literature has discovered the reason for the Government of Pakistan incurring massive external debt for financing the current public expenditures. While analyzing the economy of Pakistan in terms of macroeconomics indicators for the

45 Chaudhary and Ahmad (1995), and Hussain (2003).


49 Kemal (2001).


52 Cheema (2004).
period 1997-2003, Cheema (2004) found that the dramatic increase in Pakistan’s external debt in the 1990s was due to the Government’s practice of incurring a huge amount of external debt and using it for financing current public expenditures. The author identified the rising non-development expenditures in the form of debt servicing and defense expenditures, the persistence of both the fiscal and current account deficits, and persistently low rates of economic growth and macroeconomic mismanagement, as the important causes of Pakistan’s unsustainable debt in 1999 (external debt grew from US$ 23 billion in 1990-91 to approximately US$ 38 billion in 1998-1999). The author found that the debt servicing alone consumed 63.5% of the nation’s budget in 1998-99. This finding is consistent with earlier similar finding of Tahir (1998), Chaudhary and Ahmad (1999)\textsuperscript{53} and Anwar (2002)\textsuperscript{54}. Several adverse macroeconomic consequences of Pakistan’s high fiscal deficits and debt have been observed. Zaidi (2005) noted down a brief review of literature on Pakistan’s fiscal deficits. Based on his descriptive empirical analysis of Pakistan’s intertwined problems of fiscal deficits and debt, he critiqued the contemporary debate on fiscal deficits. The author highlighted the national debt retirement program launched by the Government of Pakistan in 1997. The author found that Pakistan’s high fiscal deficits and debt resulted in high rates of inflation, low rates of economic growth, crowding-out of both private investment and private consumption, and the current account deficits.

\textsuperscript{53} Chaudhary and Ahmad (1999) highlighted alarming dependence of Pakistan on foreign loans by pointing to the general tendency of the government of Pakistan to incur external debt even for servicing its external debt.

\textsuperscript{54} Anwar (2002) found that Pakistan’s total debt service as a percentage of exports in 1998 was significantly greater than the heavily indebted countries’ total debt service as a percentage of exports.
International reserves are potential macroeconomic stabilizers. Khan and Ahmed (2005) compiled a concise critical literature review on the ongoing debate on the demand for foreign exchange reserves. The authors introduced international reserves as a buffer for cushioning national economies against any future emergency, as an instrument of intervention in the markets of foreign currencies, and as a means of financing imbalances in the external balance of payments. The authors analyzed the process of determination of the demand for international reserves in the economy of Pakistan. The authors discovered the stability of Pakistan’s long-run international reserve demand function and found that international reserves varied positively with balance of payments, and inversely with their opportunity cost.

The domestic debt, external debt and debt servicing have caused the worsening of the debt crisis in Pakistan. The State Bank of Pakistan (2008) highlighted the domestic debt, the external debt, and the interest payments as the main factors responsible for the worsening of the contemporary debt crisis in Pakistan.

Pakistan has been relying increasingly on the IMF since the 1950s (Fasih-Uddin, 2008). Fasih-Uddin (2008) identified four phases of the history of Pakistan-IMF relations. The author affirmed that Pakistan-IMF relation had been normal in the first phase, 1950s-1960s, and that Pakistan was forced by the worsening situation of the balance of payments to frequently utilize the financial resources of the IMF in the second phase, the 1970s. The author also confirmed that Pakistan implemented the IMF’s programs of stabilization and reform programs in the third phase during the period 1980-98, and that Pakistan successfully implemented the IMF’s stand-by arrangement as well as the poverty reduction and growth fund arrangements in the
fourth phase of the IMF-Pakistan relations in 2000 and in the period 2001-2004, respectively. Moreover, the author contributed a critique of the state of Pakistan’s economy, which experienced declines in GDP growth rate, export growth rate, and gross international reserves as well as increase in poverty, amidst Pakistan’s growing reliance on the IMF.

There have also been recorded positive and negative macroeconomic effects of workers’ remittances. Abdul-Qayyum, Javid and Arif (2008) reviewed the literature, which confirms that overseas workers’ remittances have both a positive effect on economic growth by reducing both the current account deficits and the reliance on external debt — a reflection of a previous similar observation of Sarmad (1992) —, and a negative effect on poverty. The authors also quoted empirical evidence in the literature indicating a negative effect of workers’ remittances on the economy via the reduction in labour force participation rate and the consequent declines in both the labour input and GDP. By analysing the results of unit root tests and cointegration tests, the authors concluded that there is empirical evidence of significant positive effects of workers’ remittances on economic growth, and significant negative effects of workers’ remittance on poverty in Pakistan.

The debt-inflation trap has been a hallmark of the highly-indebted national economies of Pakistan and several other developing countries. Kwon, McFarlane and Robinson (2009) presented a wide-ranging review of the literature reporting the existence of a positive relationship between budget deficits and inflation, mostly in developing countries, and also examined the nature and determinants of the strength of the relationship between debt and inflation. While empirically confirming the
results of earlier similar empirical studies, the authors highlighted the inherently intertwined fiscal deficits and debt as the basic cause of high rates of inflation and significant debt-inflation trap in Pakistan and other highly-indebted nations.

2.2.2 Changing composition of Pakistan’s external debt

Ahmad and Ahmed (1998), Husain (1999), Anwar (2002), and Bilquees (2003) explained the nature of change in the composition of Pakistan’s total external debt during the period 1990-1999. In spite of the fact that Pakistan’s long-term external debt had been a dominant part of her total external debt for several decades, there occurred a quick increase in short-term and medium-term external debt as a percentage of Pakistan’s total external debt from 10.7% in the fiscal year 1990/91 to 22.1% in the fiscal year 1998/99. This change in composition of Pakistan’s external debt occurred not only due to the Government of Pakistan’s ever-increasing difficulties in obtaining long-term soft loans against the background of end of the Cold War but also due to a continuous decline in its credit worthiness as it had been borrowing only for the sake of precluding the possibility of its debt default.

Pakistan’s debt crisis involves numerous complexities. Ahmad and Ahmed (1998) described historical trends in Pakistan’s resource deficit, borrowing, and external debt and presented an analysis of the complex nature of the contemporary debt crisis in Pakistan within the framework of a stock-flow consistent three-gap simulation model. Like Ahmad (1996) and Burki (1996), the authors drew attention to the fact that Pakistan’s domestic savings were too small to accomplish her economic growth and

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55 Anwar (2002).
56 Hasan (1997).
emphasized that Pakistan resorted to external debt in the 1950s and the 1960s to finance productive investment to accelerate the economic growth rate, and that this strategy culminated in high rates of economic growth in the 1960s. This policy gave rise to the expectation that the external debt-driven economic growth could increase the saving rate as well as generate an adequate amount of exportable surplus in order to retire the external debt of Pakistan. The authors asserted that Pakistan’s external debt remained manageable in the 1970s, in spite of the then reduced rate of economic growth, especially because of the external debt’s small size and favorable terms. Gradually, Pakistan’s economy experienced a transformation of the overwhelmingly long-term nature of its external debt into the more expansive short-term external debt in the 1980s, when the imminent debt crisis was postponed by a massive influx of American aid due to the role of Pakistan as a front-line state against Soviet military intervention in Afghanistan. Therefore, Pakistan had been confronted by the serious danger of the collapse of her economy in the likely scenario of the actual cut-off of access to external debt. By accomplishing a simulation analysis, the authors demonstrated that Pakistan’s debt crisis would become worse even if there were no change in the interest rates on the foreign capital and debt, real GDP growth rates, foreign capital, money supply, price level, foreign exchange reserves, exchange rate, national saving rate, and productivity. The authors concluded from their simulation

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analysis that it has become inevitable for the Government of Pakistan to reduce its
dependence on external debt over the medium to long-run.

While explaining the continuously worsening external debt situation of Pakistan
caused by the historically unprecedented highest levels of fiscal and current account
deficits in the 1990s, Husain (1999) identified two forms of remarkable changes in
the composition of the total external debt of Pakistan. The first change in
composition of the total external debt was a dramatic decrease in the external debt
financing share of bilateral grants and concessional loans, and the corresponding
simultaneous dramatic increase in external debt financing shares of both the
multilateral as well as non-concessional loans, which was accompanied by a steep
hike in interest costs and debt servicing during the 1990s. These factors had serious
adverse macroeconomic implications in the form of the then seriously worsened
profile of Pakistan’s external debt, which eventually caused foreign exchange crisis
after mid-1996. This grave macroeconomic scenario warranted Papanek (1996)’s
policy recommendations of maintaining large reserves, significantly cutting back
imports, balancing consumption with production and imports, balancing imports with
exports, accelerating growth, reducing the large debt burden, financing balance of
trade deficit mainly by means of private foreign private investment, eliminating
corruption, and implementing long-term structural reforms. Moreover, a policy of
fiscal consolidation is also warranted by the above factors. Another form of dramatic

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60 Husain (1999).

61 Hasan (1997).
change was the doubling of the short-term share of the total external debt during the previous fifteen years.\footnote{Husain (1999).}

Anwar (2002) recorded the fact that Pakistan’s total debt had nearly doubled during the previous 5 years against the background of a profound change in its composition in the 1990s. The following, Figure 2.7, based on the World Bank data set for the 1990s used by the author, illustrates, respectively, the levels of total external debt as well as its constituents, namely, long-term external debt and short/medium-term external debt.

**Figure 2.7 Long-term, short/medium-term and total external debt**

![Graph](image_url)

Data Source: Statistics Department, State Bank of Pakistan.

\footnote{Husain (1999).}
Figure 2.7 above depicts that long-term external debt had been gradually increasing throughout the 1990s. It also shows that total external debt and short/medium-term external debt had been generally increasing over time until 1998/99, and that these two external debt variables declined in 1999/2000.

Figure 2.8 below, based on the World Bank data set for the 1990s used by the author, illustrates the change in the composition of total external debt.

Figure 2.8 Shares of long-term & short/medium-term external debt in total external debt (%)  

Data Source: Statistics Department, State Bank of Pakistan.

Figure 2.8 also depicts the generally decreasing percentage share of long-term external debt as well as the generally increasing percentage share of short/medium-term external debt until 1999, respectively. It indicates that the share of the short/medium-term external debt sharply increased from 10.7% in 1990-91 to 22.1% at the end of 1998-99. This change in composition caused a large increase in the
external debt during the period 1992/93-1998/99. Figure 2.8 indicates that the share of the short/medium-term external debt peaked at 22.1% in 1998/99 and declined in 1998/99. In contrast, Figure 2.8 indicates that the share of long-term external debt reached its minimum value of 77.9% in 1998/99 and increased in 1998/99. Here it is pertinent to note the occurrence of significantly large increases in both the volumes of especially short/medium-term external debt as well as total external debt, and the share of short/medium-term external debt during the period 1991/92-1993/94.

Figure 2.9 below, based on the World Bank data set for the 1990s used by the author, illustrates the patterns of changes in the growth rates of long-term external debt, short/medium-term external debt, and total external debt during the 1990s.

Figure 2.9 Growth rates of long-term, short-term and total external debt (%)
Figure 2.9 shows the high growth rates of long-term external debt, short/medium-term external debt, and total external debt which were, respectively, 12.2%, 10.8%, and 12.1% in 1991/92. It shows that the growth rate of long-term external debt had been generally declining over time to reach its minimum of -0.4% in the year of the external debt crisis, 1997/98, before its continuous increase during the period 1998/1999-1999/2000. It also depicts the growth rate of short/medium-term external debt dramatically increasing to become 36.1% in 1992/93 and 47.8% in 1993/94. In contrast, the growth rate of total external debt had been continuously decreasing since 1992/93 until 1999/2000 when it reached its minimum value of -0.7%. Against this background, the author argued that the aforementioned changed composition of total external debt was due to the generally substantially higher positive growth rates of short/medium-term external debt, rather than the positive growth rates of long-term external debt in the 1990s. The author found that the seeds of Pakistan’s debt crisis of the late 1990s were sown by the substantial current account deficits, amounting to around 6% of GDP in the early 1990s, and asserted that the devaluation of the Rupee, stagnating exports and foreign exchange earnings, heavy dependence on foreign resources, and import liberalization mainly caused the deterioration of the external debt indicators. The author lamented the absence of the respectable economic growth as well as the macroeconomic stability in Pakistan’s economy in the 1990s as the cause of rapid growth in the debt servicing/foreign exchange earnings ratio from 27.5% in 1994-95 to 41.4% in 1997-98, and highlighted the imperatives of achieving

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63 Import liberalization was accomplished via the reduction in maximum tariff from 225% in 1988 to 70% in 1994-05, to 45% in 1997, and to 45% in 1998-99 according to the structural adjustment program framework, which significantly reduced the protection of the domestic industries (Anwar, 2002).
fiscal consolidation based on tax reforms, recovering economic growth, and reducing poverty, stock of debt and debt servicing.

Against the background of Pakistan’s persistently high budget deficits of the 1980s and 1990s, Bilquees (2003) observed that Pakistan’s budget deficits have been significantly impacted by persistent primary budget deficits during the period 1980/81-1995/96. The author also explained the effect of continuously increasing budget deficits on the public debt of Pakistan via a three-gap model based on the revenue-expenditure gap, the savings-investment gap, and trade gap (difference between exports and imports). According to the empirical findings of the author, the original cause of the persistently high budget deficits (revenue-expenditure gap) of the 1980s and the 1990s was the Government’s practice of totally neglecting the domestic resource mobilization during the earlier periods. This was because of two factors, namely, its easy access to cheaper external financial resources, and the inflows of remittances. The author found that the debt-servicing/foreign exchange earnings ratio increased from 20.4% in 1980-81 to 31.6% in 1984-85, and that the debt-servicing/foreign exchange earnings ratio averaged around 18% in the 1990s. The author also pointed to the changing composition of Pakistan’s public debt — the domestic debt/total public debt ratio gradually increased from its value of less than 50% in the period until 1983-84, to 51% in 1983-84, and to 56% in 1990-91, before fluctuating between 53% and 56% in the later period until 2002-03.

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64 Pakistan had been experiencing primary budget deficits – implying excess of government consumption over government revenues – in almost all time periods with the exception of the very early 1980s (Bilquees, 2003).

65 Bilquees (2003).
2.2.3 Pakistan’s external debt overhang


Pakistan has not been immune to the “Dutch disease” which refers to a decline in industrial sectors as a result of the appreciation of the national currency because of a steep increase in the inflow of foreign exchange in the forms of foreign loans, foreign aid, foreign direct investment, and the revenues from abroad emanating from the export of natural resources. Iqbal (1994) offered a critical review of Pakistan-specific literature on the macroeconomic effects of the structural adjustment loans of the World Bank and the IMF, and pointed out that Pakistan has received eight structural-cum-sectoral adjustment loans from the International Development Association (IDA), the IMF, and the World Bank since 1980. The author confirmed that Pakistan had been experiencing the problems of large fiscal deficits, fast growth in money supply, an accelerating rate of inflation, unsustainable deficits in the current account, deteriorating terms of trade, and huge external debt in the 1970s and the 1980s. By using simple econometric techniques, the author found a negative coefficient of the World Bank-IMF adjustment loans (this coefficient signifies the effect of the aforementioned adjustment loans on the real output growth in Pakistan).

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66 Nafziger (2012).
due to the actual use of those loans in the non-productive activities thus causing the real output growth to decelerate. The author reported a significant positive effect of the adjustment loans on current government consumption, and interpreted it in Pakistan’s case as a Dutch disease effect.

Against the background of Pakistan’s increasingly high level of sovereign debt, Zaman (2001) provided a review of literature on an institutional perspective on sovereign debt and popular wellbeing. The author also reviewed and critiqued Pakistan’s record of the effects of external debt on economic growth and poverty. While highlighting the historical facts of the willingness of external lenders to offer sovereign debt to Pakistan, this being the sole constraint on the amount of external debt incurred by the Government of Pakistan, the author endorsed the official view of the Government that Pakistan’s declining investment as well as growth rates and increasing poverty have been caused by the increasingly high level of Pakistan’s sovereign debt resulting from persistent fiscal deficits as well as balance of payments deficits. This point of view is consistent with the empirical results of several empirical studies — for example, Iqbal (1994), Siddiqui and Malik (2001), Chaudhary and Anwar (2001), Sherani (2002), Hameed, Ashraf, and Chaudhary (2008), Ahmed and Shakoor (2011), and Rais and Anwar (2012). However, Zaman’s point of view is not consistent with the empirical results of certain other empirical studies — for example, Easterly and Schmidt-Hebbel (1991) and Khan and Rahim (1993).

Siddiqui and Malik (2001) referred to the assertion of the neoclassical growth model that perfect mobility of capital boosts economic growth. The authors accomplished a critical review of the recent theoretical as well as empirical literature on the external
debtf-growth relationship, found a lack of consensus on the external debt-growth relationship, and identified both the public debt and the external debt as the major sources of fiscal deficits and current account deficits. The authors found empirical evidence of Pakistan’s debt overhang on the basis of the significant negative effects on economic growth of the debt servicing/export ratio and debt/export ratio.

By means of a scatter-plot of the average GDP growth versus external indebtedness, Sherani (2002) demonstrated that higher-levels of external indebtedness were correlated with lower rates of economic growth of the heavily-indebted countries, including Pakistan, during the period 1980-1999.

While sounding extremely pessimistic about foreign debt as one of the prospective means of increasing the transfer of real resources to developing countries to accelerate their economic growth, Chaudhary and Anwar (2001) affirmed that the rising trend of external debt jeopardized the economic growth of the debt-ridden developing countries, and acknowledged that the South Asian countries, including Pakistan, had been entrapped in economic crises amidst their debt overhang-oriented external debt since the 1980s. The authors composed a very brief literature review on debt-overhang – classified as a mild debt-overhang which is called a liquidity trap, a weak debt-overhang, and a strong debt-overhang – and on the debt Laffer curve. They estimated a debt Laffer curve for South Asian countries, and discovered a statistically insignificant negative relationship between debt/export ratio and the secondary market price of debt outstanding in the case of Pakistan. However, the

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67 Laffer curve is a curve portraying a graphical relationship between the face value of debt of a country and the market value of the prospective debt repayments (Chaudhary and Anwar, 2001).
authors noted that Pakistan’s current debt/export ratio was less than her external debt-maximizing current debt/export ratio and, therefore, Pakistan was situated on the right side of their debt Laffer curve, implying that Pakistan’s debt problem was not as bad as depicted by several other studies on the subject. The authors concluded that the aforementioned countries could confront the problem of growing debt and debt servicing by continuing their existing borrowing trends.

For a national economy, public debt may be beneficial as well as harmful. Fan (2007) characterized public debt as a double-edged sword. While the efficient utilization of public debt can accelerate economic growth, excessive dependence on public debt and public debt mismanagement can increase macroeconomic risks (high inflation) as well as impede economic growth-cum-development by crowding-out private investment\textsuperscript{68}. The author highlighted escalating external debt as a cause of an increasing probability of default, and debt sustainability (the level and combination of public debt which enables a country to completely fulfill its current and future debt servicing obligations without accumulating debt arrears and without seeking debt relief and debt rescheduling) as the key to external debt management\textsuperscript{69}. The author identified two sets of indicators used for assessing a country’s external debt sustainability position. According to him, the first set of solvency indicators (debt/GDP ratio, debt/foreign exchange earnings ratio, debt servicing/foreign

\textsuperscript{68} This scenario would not only make it increasingly difficult for the defaulting country to borrow more, but also cause the precipitation of capital flight as well as the emergence of the financial crisis and high inflation, especially in the case of monetization of public debt (Fan, 2007).

\textsuperscript{69} Debt sustainability is also portrayed as a situation in which either the debt/income ratio decreases or remains constant over a time span of years (Fan, 2007).
exchange earnings ratio, and debt servicing/current fiscal revenues ratio) reflects a country’s capability of continuously servicing its external debt. The second set of liquidity indicators (reserves/short-term debt ratio and reserves/total external debt ratio) reflects a country’s liquid assets, which affect the capability of a country to service its immediate external debt obligations. The author referred to Pakistan’s inability to service her external debt and noted that Pakistan resorted to the exceptional financing facilities of the IMF in January 1999 in the aftermath of her severe balance of payments crisis (a direct result of her persistently growing fiscal deficits, stagnating export receipts, decreasing workers’ remittances, and enlarged current account deficits). The author noticed that Pakistan’s external was predominantly medium and long-term debt, that multilateral banks have been the largest creditors for the external debt of Pakistan, and, that both the World Bank and the Asian Development Bank have been playing an important role in the external debt financing of Pakistan. To ensure the sustainability of financing large deficits in both the medium and long-term, the author stressed the imperatives of both maintaining long-term political and economic stability, and addressing the issues of growing current account deficits and rising potential risks of Dutch Disease (possibility of deterioration of competitiveness, especially in the manufacturing sectors of Pakistan caused by the growing inflows of official development assistance and workers’ remittances via appreciation of real exchange rates).

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70 Fan (2007).

71 External debt was rescheduled twice - first by the members of Paris Club and second by London Club during the period 1998-2001 (Fan, 2007).
The debt servicing affects both the productivity of factors of production and the economic growth. Hameed, Ashraf, and Chaudhary (2008) highlighted the negative effects of the debt servicing on the productivity of labour as well as capital, and, thereby, on economic growth. The authors also empirically confirmed the negative long-run effects of debt servicing ratio on both GDP and economic growth rate, which culminated in a reduction in the capacity of Pakistan to service her debt.

Both the inelastic government revenues and the rising debt servicing may trigger persistent fiscal deficits. Fasihuddin and Swati (2009) found that the 1950s, 1960s, and 1970s were the decades of Pakistan’s economic stability characterized by both the revenue account surpluses and the accomplishment of borrowing only for satisfying developmental needs. The authors highlighted that persistent fiscal deficits had been caused by both the government’s inability to mobilize additional revenues, and the increasing liabilities of debt servicing. The authors highlighted Pakistan having revenue account deficits since 1984-85, and contended that the increasing fiscal and external imbalances forced the Government of Pakistan to join the Stabilization and Structural Adjustment Programs of the IMF and the World Bank in 1988, and to sign the Stand-By Agreement in December 2008 for ensuring the stabilization of the deteriorating fiscal and economic conditions of Pakistan. After the implementation of the above stabilization programs, the authors found that Pakistan could only reduce her total public expenditures/GDP ratio via an actual reduction in development expenditure/GDP ratio, which negatively affected the development performance of Pakistan.
Literature on the external debt crisis does not rule out the possibilities of significant positive as well as negative growth effects of external debt and debt servicing. Afzal, Hafeez-ur-Rehman and Jamshaid-ur-Rehman (2009) contributed a review of literature on multiple regression-based empirical studies indicating significant positive as well as negative effects of external debt and debt servicing on economic growth. The authors identified external debt and debt servicing as a major disbursement item in Pakistan’s exports earning budget. On the basis of the World Bank’s criterion of judging the unsustainability of debt, when the debt servicing/exports earnings ratio exceeds 20 per cent, the authors found that Pakistan’s debt had been unsustainable through the 1970s, 1980s, and 1990s – and, more specifically, from 1974/75 to 1997/98. Moreover, the authors empirically discovered a unidirectional causality running from the debt servicing to GDP.

Ahmed and Shakoor (2011) presented a very brief literature review on negative effects of external debt on economic growth. The authors used techniques of cointegration, Granger causality, and error correction, and empirically confirmed the existence of a unilateral long-run negative relationship between the external debt and the economic growth.

Rais and Anwar (2012) presented a very brief literature review on both positive and negative effects of domestic and external debt on economic growth. By estimating the multiple regression economic growth models by means of the method of ordinary least squares, they concluded that both domestic debt and external debt have significant negative effects on the economic growth in Pakistan.
2.2.4 Pakistan’s economic crisis

The use of short-term and medium-term financing for servicing the external debt may further deepen the external debt crisis. Mehmood, Rauf and Ahmad (2009) provided a brief review of the literature on the evaluation of the sustainability of Pakistan’s and other countries’ sovereign debt. The authors found that Pakistan’s external debt crisis became worse in the 1990s, primarily due to servicing the external debt mainly by means of short-term and medium-term financing. The author empirically illustrated that public debt and external debt had been unsustainable during the 1970s, the 1980s, and the 1990s. The authors found little improvement in Pakistan’s debt repayment capacity because of her persistently high fiscal deficits and current account deficits, in spite of the prolonged process of fiscal reforms, stagnating tax/GDP ratio, low level of diversification of exports, and the unbalanced as well as unsustainable pattern of growth in GDP.

The Pakistan economy has been entrapped by its intertwined financial and economic crisis. Irfan-ul-Haque (2010) diagnosed the already mentioned negative state of macroeconomic affairs of both the 1990s and the early years of the first decade of the 21st century as the causes of Pakistan’s 2008 Economic Crisis. The author also pointed out a number of other causes of the 2008 Economic Crisis – political transition to democracy, grave civil unrest in 2008, and a sharp increase in subsidies amidst a scenario of sharply rising world oil prices, with the political goal of the Government being to slowly pass on the world oil and food price hikes to consumers. The author argued that the multidimensional economic crisis, which originated from the rapidly worsening domestic and external imbalances in the early months of 2008,
was reflected in the acceleration of inflation from 7% in 2007 to 25% in 2008. The author highlighted a net outflow of portfolio investment amounting to US$1 billion and a reduced FDI of US$4 billion, along with an increase in workers’ remittances to an unprecedented amount of over US$8 billion, a continuous but average inflation rate of over 20%, and deceleration of the economic growth rate (from 4% in the 2008 fiscal year to 2%) due to the decline in the large scale manufacturing (because of severe electricity shortages), exports, and public sector development expenditures in the 2009 fiscal year. The author also noted that Pakistan experienced the effects of the international financial crisis primarily in the 2009 fiscal year, and that the terms-of-trade-shock had the sole most important adverse external influence on the deteriorating macroeconomic conditions in Pakistan. The author identified supply-side problems associated with quality of workforce, management, infrastructure bottlenecks, and the supply of electricity as the primary causes of the weak performance of the Pakistan economy in both industry and exports.

Ahmad (2011) presented a brief review of empirical literature on the existence of a direct linkage between economic growth and external debt via its impact on saving and investment. The author discovered that both the domestic and external debt caused a huge decline in savings, and concluded that the development activity bore the brunt of the debt-servicing burden disproportionately.

While confirming the dependence of Pakistan’s economic growth on the inflows of foreign capital, Abdul-Wahab and Ahmed (2011) presented a brief review of literature on the empirical evidence in support of the theoretical optimism about foreign aid as a prospective accelerator of economic growth (via the positive impact
of foreign aid on accumulation of physical and human capital), and the empirical evidence of the negative effects of foreign aid in aid-recipient nations. By accomplishing the cointegration analysis for the data set for period 1972-2010, the authors confirmed the existence of both the long-run relationships among real per capita GDP, foreign assistance, and savings and a negative effect of foreign aid on economic growth due to Pakistan’s poor macroeconomic fundamentals caused by debt accumulation.

Overall, this review of the literature reflects that several countries (for example, Argentina, Austria, Egypt, Greece, Russia, Hungary, Spain, Portugal, and Turkey) have either partly or wholly defaulted in the past\textsuperscript{72}. The indisputable facts of several countries’ actual experience of debt cycles (repetition of the scenarios of either partial or complete sovereign debt defaults) effectively illustrate both the maxim that history repeats itself, and the perception that the process of economic development in general, and the phenomena of sovereign debt defaults and the corresponding external debt crises in particular, are cyclical in nature. This argument ultimately culminates in a testable hypothesis of the existence of debt cycles.

This selective review of the literature, especially on Pakistan’s debt crisis, points to the existence of consensus between both the concerned authorities and the economists of Pakistan on the point that Pakistan’s external debt was indeed unsustainable during the 1990s. The review also implies the existence of consensus on the occurrence of Pakistan’s debt crisis in the second half of the 1990s.

\textsuperscript{72} Nafziger (2012) and Keynes (1924).
A glimpse of Pakistan’s evolving debt crisis is provided by Figure 2.10 depicting real total external debt stock measured in US Dollars, which is calculated via the division of total external debt stock by the GDP deflator using the data set reported by the World Bank in *World Development Indicators 2012*, and Figure 2.11, depicting external debt servicing as a percentage of exports of goods, services, and income reported by the World Bank in *World Development Indicators 2012*.

In Figure 2.10 following, the years ranging from 1981 to 2010 are shown along the horizontal axis and real total external debt stock is measured along the vertical axis.

**Figure 2.10**


Figure 2.10 above shows that real total external debt stock has been fluctuating upward and downward during the period 1981-2010. Real total external debt stock was US$1,055.03 million in 1981 and US$5,511.93 million in 2010. It shows that real total external debt stock prominently peaked, initially, at US$4,500.15 million in 1986, then at US$5,735.84 million in 1999 amidst Pakistan’s external debt crisis.
again later at US$13,426.74 in 2002, and afterwards at US$5,393.65 million in 2007, and finally at US$5,511.93 million in 2010. It reflects the recurrent nature of Pakistan’s external debt crisis.

In Figure 2.11 below, the years ranging from 1981 to 2010 are shown along the horizontal axis, and total external debt service as a percentage of exports of goods, services, and income is measured along the vertical axis.

Figure 2.11 Total external debt service as a percentage of exports (%)


Figure 2.11 above shows that total external debt service as a percentage of exports has been violently fluctuating upward and downward during the period 1981-2010. It shows that total external debt service as a percentage of exports was 25.9% in 1981 and 15.2% in 2010. It also shows that real total external debt service as a percentage of exports prominently peaked, initially, at 39.6% in 1985, then at 38.2% in 1994, and again later at 40.3% in 1997, immediately before Pakistan’s external debt crisis, and afterwards at 26.4% in 2004, and finally at 15.2% in 2009 and 2010. It also
reflects a very high frequency of total external debt service as a percentage of exports being greater than 25%, as well as the recurrent nature of the vulnerability of the Pakistan economy to external debt crises.

In light of Figures 2.10 and 2.11, it is evident that both real total external debt stock and total debt servicing as a percentage of exports exhibited a general upward trend during the periods 1980-1986 and 1998-1998 and a general downward trend during the periods 1987-1990 and 2002-2006.

This above literature review suggests that Pakistan’s debt crisis clearly resembles the contemporary as well as the past debt crises of certain countries (for example, Greece). In spite of the fact that Greece and Pakistan have quite different underlying macroeconomic structures, institutional frameworks (for example, the European Union (EU) framework versus non-EU framework), Pakistan’s external debt/GDP exceeded 54% during her external debt crisis and, similarly, Greece’s net external debt/GDP ratio exceeded 54% during her external debt crisis73.

It also indicates a remarkable similarity in the official policy responses to their respective debt crises – such as cuts in public expenditures on health and education – of the governments of almost all the debt crisis-hit countries – irrespective of whether they are developing countries like Pakistan or developed countries such as the United Kingdom and the United States of America.

Review of both the general literature on the external debt crises and the literature on the external debt crisis of Pakistan highlights numerous national external debt crises

73 Hasan (1999) and Dias (2010).
as a serious global external debt problem and discovers the fact that both the governments of developing countries like Pakistan and the governments of the developed countries (for instance, Australia, UK, USA, and the Euro zone countries like Greece) agree in principle on the policies of deficit financing by means of domestic and external debt, reducing the existing unsustainable high levels of budget deficits, domestic debt, and sovereign debt by means of austerity-oriented radical fiscal reforms, which simultaneously aim at dramatically reducing their public expenditures, significantly increasing public revenues to reduce their budgetary deficits, domestic debt, and external debt. However, here it is pertinent to note that the developed countries have been trying to alleviate their respective sovereign debt crises in the framework of different sets of constitutional checks and balances, institutional constraints and macroeconomic environments. While the willingness of the foreign lenders to Pakistan is the sole constraint on the unbridled accumulation of external debt on the part of the Government of Pakistan amidst the widespread problems of financial corruption and embezzlement, lack of transparency, accountability, efficiency, justice, and mismanagement in the process of allocation and usage of domestic and external debt in Pakistan, the above developed countries have demonstrated the effectiveness of their external debt reduction policy mainly due to their legally inviolable constitutional limits on their sovereign debt, institutional constraints, built-in mechanisms of monetary-cum-fiscal self-discipline and political accountability, and relatively corruption-free transparent mechanism of public finance. In contrast to a pragmatic mix of the individual and collective

effective remedial policy measures of the developed countries for their respective
national external debt crises (for example, significant reduction in fiscal deficits,
mutual financial bailouts, promotion of both their mutual international trade and
foreign direct investment inflows among themselves in the framework of their
regional economic blocks), a general policy response of the Government of Pakistan
to its external debt crisis has been in the forms of incurring additional external debt in
the form of short-term loans for even financing its current expenditures borrow and
for servicing its external debt, rolling over its existing external debt, devaluing its
currency according to the policy recommendations of the IMF, increasing regressive
general sales tax, and reducing its already inadequate development expenditures75.
Against this background, the external debt overhang and the unsustainable burden of
debt servicing emerged as the most serious macroeconomic problem in Pakistan76. In
addition, the poor external debt management on the part of the Government of
Pakistan and foreign lenders (for example, IMF) made Pakistan’s external debt crisis
worse77. As compared to the above developed countries amidst their external debt
crises, Pakistan became more economically and strategically vulnerable due to her
external debt crisis, external debt overhang, and loss of creditworthiness78.

This review makes it clear that Pakistan’s chronic fiscal deficits, which emerged in
the wake of very low rates of national savings and huge deficits in balance of trade

77 Ahmad (2011).
78 Siddiqui and Siddiqui (2001), Kemal (2001), and Ahmad (2011).
and balance of payments, triggered Pakistan’s debt crisis during the 1990s. While highlighting the fact that the seeds of the causes of the 2008 economic crisis in Pakistan had been sown during the late 20th century, it establishes that Pakistan’s debt crisis has backward and forward linkages with Pakistan’s other multiple economic crises, such as recession in the 1990s — GDP growth rate significantly declined from 6.1% in the 1980s to 4.4% in the 1990s79 —, financial crises (for example, 60.3% of Pakistan’s revenues were used for debt servicing in 2000)80, poverty crisis (for instance, share of population below Pakistan’s poverty line increased from 26.6% to 32.2% during the period in 1992/93-1998/99)81, water crisis in agriculture sector (that is, water delivery efficiency from canals to crops’ root zone ranges from 30% to 40%)82, and energy crises (for example, chronic acute shortages and load shedding of electricity due to inefficiencies in production and distribution of electricity, wasteful consumption, losses in the process of transmission of electricity, and rising electricity prices amidst steep decline in electricity’s share of total capital formation from 21.4% in 1994/95 to 4.2% in 2007/0883.

The literature on Pakistan’s debt crisis implies that the excessive external debt and external debt service burden have been big hindrances to the growth of the economy – one of the fundamental hypotheses of this thesis – because fluctuations in both the

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79 Fasih-Uddin and Swati (2009).
80 Hussain (2003).
81 Hussain (2003).
82 Hussain (2003).
83 Fasih-Uddin and Swati (2009).
external debt and foreign aid have caused fluctuations in the growth rate of the economy. This is why, despite the positive correlation between capital inflows and growth rates and a period of political stability in the 1960s, a drop in foreign aid was followed by a drop in Pakistan’s growth rate in the second half of the 1960s.

Pakistan’s external debt crisis hindered the economic growth via both cuts in development expenditure and excessive indirect taxation (15% general sales tax), which caused inflation and, thereby, reduced effective aggregate demand, and the growth rate. In this context, the effect of variables such as growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock and total debt servicing as a percentage of exports of goods, services, and income first of all on the real GDP growth rate and later on the growth rates of real GDP shares of agriculture, industry, and services, can be determined by using net inflows of foreign direct investment, workers’ remittances, money supply, real capital stock and total labour force as the control variables. All these variables, either used as dependent, explanatory or control variables, have been directly obtained from the literature. For instance, the growth rates of real GDP, capital stock and labour force are obtained from the neoclassical growth theory contributed by Robert Solow (Nafziger, 2012) as well as from the empirics of economic growth contributed by Mankiw, Romer and Weil (1992), and from the economic growth-specific empirical work accomplished by Chenery and Strout (1966), Cunningham (1993) and Iqbal (1994). Similarly, the growth rate of debt servicing as a percentage of exports is obtained from Cunningham (1993), and the growth rate of external debt (total, short-term and long-term external debt) is obtained from Benmelech and Dvir (2011) as
well as Chishti and Aynul-Hasan (1992). Moreover, the control variable the growth rate of workers’ remittances is obtained from Abdul-Qayyum, Javid and Arif (2008), the growth rate of FDI is obtained from Nunnenkamp (1991), and the growth rate of money is obtained from Chaudhary and Ahmad (1995) as well as from the recent monetary growth theory, which treats money as one of the several factors of production (Pierson, 1972). The data on the above variables are also available in the World Development Indicators 2012 published by the World Bank.

Notwithstanding the existing differences of opinion regarding fiscal deficits, the review of the empirical literature on Pakistan’s and other countries’ sovereign external debt crises confirms the empirical validity of the point of view that budgetary deficits, being the root cause of debt crises, are not only inevitably required to be significantly reduced but also inevitably required to be replaced by sustainable budget surpluses for meaningfully alleviating the contemporary sovereign debt crises. The literature review indicates that the prospective solution to Pakistan’s debt crisis lies not only in achieving significantly higher sustainable national savings and investment rates, sustainable budget surpluses, sustainable balance of trade surpluses, and sustainable balance of payments surpluses, but also in implementing effective austerity reforms. In this context, it is pertinent to recommend policies of eliminating superfluous public administrative expenditures as well as other wasteful current public expenditures\(^{84}\), eradicating massive corruption and wastage of public funds by means of constitutional, institutional, legal, judicial and administrative

\(^{84}\) For example, public expenditures on permanently inefficient public sector enterprises, such as Pakistan railways, public expenditures on the subsidized provision of industrial and agricultural inputs.
reforms, increasing in the growth-oriented development expenditures on human resource development\textsuperscript{85} and infrastructure\textsuperscript{86}, privatizing the inefficient public sector enterprises\textsuperscript{87}, controlling inflation via fiscal and monetary discipline by ensuring the effective functional independence of especially the State Bank of Pakistan in letter and spirit, imposing constitutional ceilings on deficit financing, domestic debt and external debt, ensuring the highest possible level of justice, efficiency, transparency and accountability in the allocation/usage/investment of public funds as well as domestic and external debt, instituting taxation\textsuperscript{88} and expenditure\textsuperscript{89} reforms in the arena of public finance with the policy objective of eventually achieving balanced budgets and budget surpluses, instituting progressive international trade reforms for promoting and diversifying industrial exports not only by domestically employing the exportable raw materials for producing as well as exporting quality industrial products instead of exporting raw materials but also by integrating the Pakistan’s export sector with all the potential foreign target markets, increasing the inflows of workers’ remittances by training as well as facilitating the unemployed workers to get employed in foreign countries, and accelerating foreign investment in Pakistan by

\textsuperscript{85} For example, education/training and healthcare.

\textsuperscript{86} For example, electric power generation, big and small dams, extension and restoration of the existing irrigation network of canals, intercity motorways and roads from farms to markets, modern mass transport systems in all big cities.

\textsuperscript{87} Hussain (2003).

\textsuperscript{88} For example, implementation of an equitable system of taxation of all sectors (agriculture/mining, industry, and the services) without any provision of exemption for any sector.

\textsuperscript{89} For example, an equitable distribution public expenditure among all provincial as well federal territories, regions (that is, rural and urban regions), and sectors (for example, agriculture, mining, industry, and the services) without any discrimination provision of exemption for any sector for achieving balanced growth.
ensuring the emergence of a foreign investment-friendly macroeconomic environment in Pakistan.

However, in spite of the widespread recognition of Pakistan’s public debt crisis and external debt crisis in the late 1990s, the literature on Pakistan’s external debt crisis includes either descriptive empirical analysis of the macroeconomic effects of the external debt crisis, or merely the regressions-based empirical analyses of determination of the real GDP growth effects of only total external debt growth and external debt servicing. In the literature on Pakistan’s debt crisis, an empirical analysis of the dynamic effects of Pakistan’s debt crisis on three sectoral shares of real GDP is conspicuously absent. This empirical analysis is also the subject matter of this thesis, as is the examination of the long-run dynamic macroeconomic growth effects of Pakistan’s on-going external debt crisis observed during the 1990s and 2000s.

Moreover, an extension in the literature is warranted by the fact that most of these empirical research works on Pakistan’s external debt crisis and its economic growth effects are out-dated in the sense that they were published either in the late 1990s or in the early 2000s, soon after the external debt crisis.

Despite the existence of a lot of literature on Pakistan’s debt crisis, a noteworthy deficiency of the empirical literature is that it does not capture the multiple dynamic macroeconomic growth effects. Indeed, there is scope for updating the empirical research on Pakistan’s external debt crisis as well.
Moreover, another deficiency in the existing literature is the lack of an up-to-date comprehensive simultaneous empirical analysis of the effects of the growth rates of Pakistan’s real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports of goods, services, and income on the growth rates of real GDP, agriculture’s share of real GDP, industry’s share of real GDP, and the services’ share of real GDP. The existing literature on Pakistan’s debt crisis also lacks an up-to-date comprehensive empirical research on the short-run, long-run, and dynamic growth effects of the on-going external debt crisis during the 1990s and 2000s. This empirical analysis is also the subject matter of this thesis along with both an examination of the short-run and long-run effects of the growth rates of the aforementioned four external debt growth variables of Pakistan on the real GDP growth rates, and on the aforementioned three sectoral real GDP shares’ growth rates, and an explanation of the dynamic inter-linkages between them during the period 1981-2010.

2.3. Conclusions and policy recommendations

This literature review highlights the spectrum of diverse theoretical perceptions of various schools of economic thought about the prospective roles as well as macroeconomic effects of budget deficits, deficit financing, and sovereign debt of nations. It confirms that for several decades Pakistan has been experiencing a chronic problem of too much reckless reliance on external debt as a key driver of its economic growth and development. It portrays the fact that Pakistan’s reckless accumulation of external debt, indeed, not only generated patterns of unsustainable patchy growth during the 1960s, the 1980s, and around the mid-2000s, but also
resulted in the recession and the imminent sovereign debt default of Pakistan during the late 1990s.

The review of the empirical literature on the sovereign debt crises of Pakistan and other countries establishes the view that budgetary deficits, being the root cause of debt crises, are not only required to be significantly reduced but are also required to be replaced by sustainable budget surpluses to meaningfully alleviate the contemporary sovereign debt crises. It indicates that the prospective solution of Pakistan’s debt crisis lies in realizing significantly higher sustainable national savings and investment rates, sustainable budget surpluses, sustainable balance of trade surpluses, and sustainable balance of payments surpluses, as well as the effective implementation of austerity reforms.

The surveyed literature offers a quite wide range of different policy recommendations for solving the problems of external debt crisis and external debt overhang in Pakistan and other heavily indebted countries. For having a coherent understanding of these remedial policy recommendations of different studies, these policy recommendation are being systematically categorized and homogenized in light of their inherent interconnections based on the existence of fundamental relationship between a country’s domestic resource gap and foreign exchange gap in the sense that domestic saving-investment gap and fiscal deficits (domestic resource gap) spill over into current account deficits and balance of payments, and, thereby, create foreign exchange gap. Pakistan is a classic example of developing countries, which

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persistently have very low national saving rate relative to the required investment rate, fiscal deficits, and current account deficits in the balance of payments. Therefore, Pakistan has been excessively relying on the inflows of foreign capital in the form of external debt/aid, which culminated in an unaffordable burden of external debt service (in the 1990s) having negative implications for both the fiscal balance and current account balance. Thus, a number of empirical studies recommended the policies of increasing national saving rate as well as selling assets to domestic buyers to achieve economic self-reliance and implementing structural reforms (for example, austerity in expenditures, tax reforms, and elimination of corruption) in the fiscal structure for ensuring significant reductions in primary deficits, fiscal deficits, domestic debt, and external debt over the medium to long-run via the sustained increases in public revenues and the sustained cut in public expenditures. Papanek (1996) recommended the policy of attracting the requisite private foreign investment for generating sufficient income to service the external debt, and accelerate the growth of output and exports. Sachs (1989) recommended a debt management policy consisting of a combination of both a strategy of debt forgiveness, and a debt rescheduling strategy for managing the sovereign debt crises. To ensure the sustainability of financing large deficits in the medium and long-term, Fan (2007)

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92 Meier (1995), and Aqeel and Nishat (2000).
recommended the policy of maintaining long-term political and economic stability, and addressing the issues of growing current account deficits and rising potential risks of Dutch Disease. To accelerate economic growth, Dijkstra and Hermes (2003) recommended a policy of reducing the volatility in debt service payments via a reduction in the level of debt. To preclude the possibilities of external debt-overhang, Klein (1991) recommended an alternative policy of using various forms of equity financing for accelerating economic growth.

The literature on Pakistan’s debt crisis gives rise to one of the fundamental hypotheses of this thesis that, especially the external debt service burden has become big hindrances to the growth of the economy – via its impacts on both cuts in development expenditure and excessive indirect taxation, which has caused inflation and, thereby, reduced the effective aggregate demand. In this context, the effects of variables such as the growth rates of real total external debt stock, real long term external debt stock, real short-term external debt stock, and total external debt servicing as a percentage of exports, first on real GDP growth rate and later on the growth rates of sectoral real GDP shares, can be determined by using net inflows of FDI, workers’ remittances, money supply, total real capital stock and total labour force as the control variables. This empirical analysis is the subject matter of this thesis.
Chapter 3

Effects of external debt growth variables on the growth rate of real GDP for Pakistan

3.1 Introduction

This chapter examines the real GDP growth effects of external debt growth variables for Pakistan during the era of external debt accumulation since 1981. More specifically, it uses the unit root tests for nonstationarity, the method of Ordinary Least Squares (OLS), OLS residual and stability diagnostics, and the Johansen’s multiple cointegration tests for empirically determining short-run and long-run effects of the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rate of real GDP. The tests for cointegration are carried out to determine the existence of long-run stable equilibrium relationships between the real GDP growth rate and the relevant explanatory variables.

Section 3.2 presents the empirical econometric analysis of the real GDP growth effects of the four external debt growth variables. Subsection 3.2.1 presents the estimation results of short-run real GDP growth models using three control variables (the growth rates of real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money). This subsection also presents an analysis of the robustness of results of short-run econometric models
to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock). In addition, it presents the empirically determined elasticities of the real GDP (with respect to the explanatory variables), which are estimated using double-log regression models of dependent variables in the form of real GDP and the explanatory variables by means of the OLS method. Subsection 3.2.2 presents an empirical analysis of the long-run effects of four external debt growth variables on the growth rate of real GDP on the basis of empirical results of the Johansen cointegration tests. Finally, Section 3.3 presents a summary, conclusions and policy recommendations.

3.2 Real GDP growth effects of the external debt growth variables

Pakistan had been running current account deficits for the period 1981-2010. This has meant that Pakistan has been depending on foreign resources and external debt for financing not only the national savings-investment gap, but also the foreign exchange gap (the excess of imports over exports) to foster economic growth and development. Against this background, and to test the efficacy of such an approach, it is important to estimate the economic effects of Pakistan’s ever-growing external debt on the growth rate of real GDP.

The annual time series of the variables are obtained from the World Bank’s World Development Indicators available for the period 1981-2010. The time series real capital stock \( K_{t+1} = (1-\delta)K_t + I_t \) is calculated via the use of World Development Indicator gross capital formation as percentage of GDP, Dadkhah and Zahidi (1990)’s empirical estimates of Pakistan’s initial capital stock in 1980 (\( K_0\))=Pakistani
Rupees 293.8 Billion) [Dadkhah and Zahidi1 1990, p. 403] and the depreciation rate of capital stock ($\delta$) being equal to 0.082 (Dadkhah and Zahidi 1990, p. 395), and Pakistani Rupees 9.9 per US Dollar as at the end of the year’s (1980) average exchange rate obtained from the Balance of Payments Statistics 1960-2009 published by the International Monetary Fund (IMF). The names, acronyms, and data sources of all the relevant variables are presented in Table 3.1 in the appendix to this chapter. In addition, descriptive statistics are presented in Table 3.2 in the appendix. The correlations between the external debt variables were calculated using Spearman’s rank-order correlation coefficients. These are reported in Table 3.2.1. The correlations between real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports were not strong.

After testing the growth time series for nonstationarity by means of the Augmented Dickey-Fuller test statistics and the Phillips-Peron test statistics, results of these unit root tests for nonstationarity of the growth rate time series are presented in Table 3.3 in the appendix. The Phillips-Peron test statistic is more suitable due to the small sample properties of the available relevant annual data set for the period 1981-2010. On the basis of the Phillips-Peron test statistics, the first-differenced growth rate of real capital stock and all other relevant growth rate time series are confirmed to be stationary at the 99% confidence level.

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The Phillips-Peron unit root test-based stationarity of all the above growth variables and the first-differenced growth rate of capital stock, which result from differencing, has determined the appropriateness and relevance of using and estimating only short-run model (model including only and only the relevant stationary variables) to determine the short-run real GDP growth effects of the external debt growth variables. In other words, the stationarity of variable is the prerequisite for a estimating a short-run model. This approach is premised in the fact that there is no time available for the occurrence of any change in the mean and variances of variables in the short-run, and, therefore, all variables are stationary in the short-run implying the relevance of only the short-run models for estimation. In contrast, all variables are nonstationary in the long-run because of occurrence of changes in mean and variance of variables in the long-run implying the appropriateness of estimating a long-run model, which includes nonstationary variables.

While the economic theory perceives the existence of equilibrium (long-run) relationships among macroeconomic variables instead of disequilibrium relationships among them, the actual macroeconomic time series data may exhibit disequilibrium relationships among the time series about which the economic theory cannot offer much explanation (Utkulu, 1997). This problem has been resolved by economists by distinguishing between short-run and long-run relationships among the macroeconomic time series and testing the existence of long-run relationships among them by means of cointegration technique, which allows the use of nonstationary time series of variables in levels and confirms the existence of equilibrium (long-run) relationship among them in case of existence of cointegration among the
nonstationary time series in the sense that a linear combination of the nonstationary time series is stationary [(Utkulu, 1997) and (Moosa and Bhatti, 1997)]. As the economic theory is mainly concerned with the determination of true long-run relationships among the macroeconomic variables, the prime beneficial aspect of the Johansen Maximum Likelihood (ML) method is that it helps determine true long-run economic relationship among macroeconomic variables by determining the number of existing cointegrating (i.e. long-run) relationships among the variables under consideration as well as the order of cointegration. This concern of the economic theory for the true long-run relationship justifies the determination of long-run real GDP growth effects of external debt growth by using Johansen cointegration technique method.

Here it is also pertinent to note the methodological differences between short-run models using a conventional OLS regression and a cointegrating regression — while the changes in the dependent variable $Y_t$ are due to changes in both an independent variable $X_t$ and a purely random error term $\epsilon_t$ (that is, white noise) in the case of OLS regression, $\epsilon_t$ is not necessarily purely random in the case of $\epsilon_t$ being a general stationary process in the case of cointegrating equation (Moosa and Bhatti, 1997, p. 169). In contrast to a conventional OLS regression, it is not required to designate one of the above variables as exogenous in the cointegrating equation because the decomposition of the movement of the two time series is symmetrical in the cointegrating equation (Moosa and Bhatti, 1997, p. 169).

While all the above growth variables and the first-differenced growth rate of capital stock are stationary, not all their corresponding original underlying variables
(logarithms of real GDP, real total external debt stock, real long-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, foreign direct investment net inflows, and total labour force) in levels are stationary on the basis of the Phillips-Peron tests of nonstationarity at the 99% confidence level. Therefore, there arises a technical justification for testing the existence of cointegration among the above relevant growth variables for determining the long-run real GDP growth effects of the above four external debt growth variables via the Johansen cointegration test. The Johansen cointegration test, employing all the above relevant growth variables and the first-differenced growth rate of capital stock, is used to test the null hypothesis of no cointegrating vector for determining whether there exists the possibility of the presence of a long-run stable equilibrium relationship among them. Therefore, the primary interest of the present empirical study lies in determining both the short-run and long-run effects of the growth rates of external debt variables on the growth rate of real GDP in order to know whether the short-run effects are similar to or different from the long-run effects.

3.2.1 Short-run econometric models of real GDP growth effects of external debt growth and estimation results

The stationarity of all the above growth time series implies the relevance of estimating short-run econometric models of real GDP growth. To determine the short-run effects of external debt on economic growth, the OLS method was used to estimate sixteen standard growth regression models including the independent variables, which have been found significant in explaining economic growth in the
growth models discussed in the empirical literature. This approach sounds reasonable as the estimations of the sixteen growth models make it possible to present a comprehensive spectrum of all possible scenarios of the estimated real GDP growth effects of all explanatory external debt variables in the framework of the various growth models. More specifically, the growth models make it possible to identify the individual real GDP growth effects of the explanatory external debt growth variables in the framework of the various growth models having either one, two, or three, or all of the explanatory external debt growth variables with or without the set of control variables. In other words, this econometric modelling approach of adding explanatory variables step-by-step in the econometric models makes it possible to detect any major changes in the magnitude and significance of the coefficients of the explanatory variables after the addition of an explanatory variable in an econometric model. Estimation results of these real GDP growth models are presented in Table 3.4 in the appendix.

An econometric justification is found for only 13 of the above 16 real GDP growth models, which simultaneously passed the tests associated with the OLS residual diagnostics\(^2\) and stability diagnostics\(^3\) at 1% and 5% significance levels in light of empirical results of these diagnostics presented in Table 3.4.1 in the appendix. Out of these 13 real GDP growth models, here it is pertinent to select only the right

\(^2\) Jarque-Bera test for normality, Breusch-Godfrey Serial Correlation LM Test in the form of Probability of F-Statistic, Breusch-Pagan-Godfrey Test of Heteroskedasticity in the form of Probability of Chi-Square-Statistic, and Heteroskedasticity Test for Autoregressive Conditional Heteroskedastic (ARCH) Effects in the form of Probability of Chi-Square-Statistic.

\(^3\) Chow Breakpoint Test for the breakpoint date of 1998 – Pakistan’s nuclear tests of 28 May 1998 triggered the imposition of the Western powers’ economic sanctions against Pakistan, which, in turn, triggered Pakistan’s external debt crisis in 1998 (Husain 1999, p.419).
models (Models 3, 8, 9, 13, 15, and 16 having signs of the estimated coefficients of the explanatory variables according to both theory and expectations) and present only the empirical results of the above six real GDP growth models, on the basis of the selection criterion of theoretical relevance-cum-plausibility of the models in terms of the usefulness of their explanatory variables determined by the underlying economic theory.

### 3.2.1.1 Econometric modelling and estimation results

A generic form of the aforementioned Real GDP Growth Models is presented below:

$$\hat{y}_t = \alpha_0 + \alpha_1 \hat{x}_t + \alpha_2 \hat{z}_t + \epsilon_t$$  \hspace{1cm} (3.1)

In equation 3.1, $\hat{y}_t$ signifies the growth rate of real GDP ($y_t$), $\hat{x}_t$ signifies the vector of the growth rates of explanatory variables ($x_t$), namely, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and $\hat{z}_t$ signifies a vector of the growth rates of controls ($z_t$), namely, real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money.

In the Real GDP Growth Model 3, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real long-term external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 3.4, both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.
In the Real GDP Growth Model 8, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 3.4, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP, and both the growth rates of real total external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 9, the growth rates of real total external debt stock and total debt servicing as a per cent of exports are replaced by the growth rates of real long-term external debt stock and real short-term external debt stock (vis-à-vis Model 8) and the equation is re-estimated. From the estimation results in Table 3.4, both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP growth model 13, the growth rate of real long-term external debt stock is added to the set of explanatory variables in the Real GDP Growth Model 8 and the equation is re-estimated. From the estimation results in Table 3.4, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP. In contrast, the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of real GDP.
In the Real GDP growth model 15, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 3.4, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP. In contrast, the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 16, the growth rate of real total external debt stock is added to the set of explanatory variables in the Real GDP Growth Model 15 and the equation is re-estimated. From the estimation results in Table 3.4, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP. In contrast, the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of real GDP.

From the point of view of an empirical analysis of the effects of external debt variables on real GDP, it is also important to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of real GDP to changes in its determinants, such as real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, and other pertinent control variables by means of estimating the double-log regression models (Studenmund 2011, p. 213). Also, Gujrati (2009) notes that the fit
of a double-log model seems to be slightly better than the fit of the linear model. Of course, the use of the double-log models is also justifiable on the basis of exploring the possibility of changes in the nature of statistical significance of the determinants of the real GDP. Thus, the effects of the explanatory variables described above on the percentage change in real GDP rather than the growth rate of real GDP are analysed.

All the aforementioned variables’ log time series (logarithms of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows and money and quasi money growth rate) were tested for nonstationarity by using the Augmented Dickey-Fuller test statistics and the Phillips-Peron test statistics. Results of unit root tests for nonstationarity of all the log time series are presented in Table 3.5 in the appendix.

While replicating the construction pattern of the same above 16 models, 16 double-log real GDP models are estimated by using the stationary as well as nonstationary log time series.

A generic form of these double-log real GDP models is presented below:

$$log Y_t = \beta_0 + \beta_1 log X_t + \beta_2 log Z_t + \eta_t$$  

(3.2)

In equation 3.2, $Y_t$ signifies the real GDP, $X_t$ is a vector of explanatory variables including real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and $Z_t$ is
a vector of controls including real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money growth rate.

Estimation results of the 16 double-log real GDP models are presented in Table 3.6 in the appendix. It is pertinent to note that all the estimated absolute values of elasticities of real GDP, with respect to its explanatory external debt variables and control variables are less than one, thereby implying that real GDP is inelastic.

Now the regression equation 3.1 is being re-estimated using the slightly modified approach of Cunningham (1993) to determine the robustness of the above estimation results to the addition of two more control variables, stationary time series of the growth rate of the total labour force (instead of population growth rate) and the first-differenced growth rate of real capital stock (instead of investment/GDP ratio), to the above vector of control variables $\hat{Z}_t^4$. Results of unit root tests for nonstationarity of all the above growth rate time series are already presented in Table 3.3 in the appendix. On the basis of the Phillips-Peron test statistics, the first-differenced growth rate of real capital stock and all other relevant growth rate time series are confirmed to be stationary at the 99% confidence level. In this amended modelling framework, equation 3.1 is re-estimated and the estimation results of 16 of real GDP growth models are presented in Table 3.7 in the appendix.

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4 Here, the modified approach of Cunningham (1993) is used partly because of the availability of the World Bank data for our preferred variables and partly because of the greater theoretical suitability of the selected explanatory variables for explaining the growth rates of both real GDP and its sectoral shares.
An econometric justification is found for the estimation of only 14 of the above 16 real GDP growth models, which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 1% and 5% significance levels in light of the empirical results of these diagnostics presented in Table 3.7.1 in the appendix.

Out of these 14 real GDP growth models, here it is pertinent to select only the right models (Models 1, 3, 6, 8, 10, 13, 15 having signs of the estimated coefficients of the explanatory variables according to both theory and expectations) and present only the empirical results of the above seven real GDP growth models, on the basis of the aforementioned selection criteria.

In the new Real GDP Growth Model 1, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, total labour force, and the first-differenced growth rate of real capital stock. From the estimation results in Table 3.7, only the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP.

In the Real GDP Growth Model 3, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real long-term external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money, total labour force, and the first-differenced growth rate of real capital stock. From the estimation results in Table
3.7, both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 6, the growth rate of real total external debt stock is added to the set of explanatory variables of the Real GDP Growth Model 3 and the equation is re-estimated. From the estimation results in Table 3.7, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 8, the growth rate of real long-term external debt stock is replaced by the growth rates of real total external debt stock and total external debt servicing as a percentage of exports (vis-a-vis Real GDP Growth Model 3) and the equation is re-estimated. From the estimation results in Table 3.7, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP, and both the growth rates of real total external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

In the Real GDP Growth Model 10, the growth rate of real GDP is assumed to vary in response to changes in the growth rates of real long-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money, total labour force, and the first-differenced growth rate of real capital stock. From the estimation results in Table 3.7, the growth rate of total
debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP, and both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 13, the growth rate of real total external debt stock is added to the set of explanatory variables in the Real GDP Growth Model 10 and the equation is re-estimated. From the estimation results in Table 3.7, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP. In contrast, both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

For the Real GDP Growth Model 15, the growth rate of real short term external debt stock is added to the set of explanatory variables in the Real GDP Growth Model 10 and the equation is re-estimated. From the estimation results in Table 3.7, the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP. In contrast, both the growth rates of real-long term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

A comparison of Real GDP Growth Model 3 in Tables 3.4 and Real GDP Growth Model 3 in Table 3.7 confirms that both the growth rates of real long-term external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP. Real GDP Growth Models 8, 13, and 15 in
both Tables 3.4 and 3.7 confirm that the growth rate of total debt servicing as a percentage of exports has a significant negative effect on the growth rate of real GDP, and both the growth rates of real total external debt stock and real foreign direct investment net inflows have a significant positive effect on the growth rate of real GDP.

A comparison of Tables 3.4 and 3.7 shows that the significant short-run positive real GDP growth effect of the growth rate of real total external debt stock observed in four real GDP growth models (Models 2, 7, 8 and 14) in Table 3.4 in the case of the three control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock), as reflected in the four models (Models 2, 7, 8 and 14) in Table 3.7.

There is empirical evidence – based on the estimation results of several pertinent real GDP growth models in Tables 3.4 and 3.7 – indicating the existence of a significant short-run positive effect of the growth rate of real long-term external debt stock on the growth rate of real GDP, which is not at all surprising because it is consistent with the growth theory. A comparison of Tables 3.4 and 3.7 shows that a significant short-run positive real GDP growth effect of the growth rate of real long-term external debt stock observed in the case of the three real GDP growth models (Models 3, 9 and 15) in Table 3.4 in the case of three control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is robust to the
inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock), as reflected in the three real GDP growth models (Models 3, 9 and 15) in Table 3.7. While there is empirical evidence of the existence of a significant short-run positive effect of the growth rate of real long-term external debt stock on the growth rate of real GDP, there is absolutely no empirical evidence of the existence of significant negative effects of the growth rate of real long-term external debt stock on the growth rate of real GDP. However, this result differs from the results of other slightly similar empirical studies accomplished by Iqbal (1994), who found a negative effect of the world Bank-IMF adjustment loans on Pakistan’s real output growth, and Rais and Anwar (2012), who found a significant negative effect of external debt/GDP ratio on the growth rate of real GDP per capita for the period 1972-2010.

Nevertheless, there is no empirical evidence of any significant short-run effect of the growth rate of real short-term external debt stock on the growth rate of real GDP in the pertinent five real GDP growth models in Tables 3.4 (in the case of the three control variables — the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) and 3.7 (in the case of the five control variables — the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money and the total labour force and the first-differenced growth rate of real capital stock).

There is empirical evidence – based on the estimation results of the several pertinent real GDP growth models in Tables 3.4 and 3.7 – indicating the existence of the
significant short-run negative effects of the growth rate of total debt servicing as a percentage of exports on the growth rate of real GDP. A comparison of Tables 3.4 and 3.7 shows that the significant short-run negative real GDP growth effect of the growth rate of total debt servicing as a percentage of exports observed in six pertinent Real GDP Growth Models (Models 1, 8, 13, 14, 15 and 16) in Table 3.4 in the case of three control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock) in the set of pertinent real GDP growth models (Models 1, 8, 10, 13, 14, 15 and 16) in Table 3.7.

As for the earlier analysis of the real GDP growth, it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of real GDP to changes in its determinants, by means of estimating the double-log regression models of real GDP after adding two more control variables, the total labour force and the real capital stock, in the above vector of control variables $Z_t$ in equation 3.2. While replicating the construction pattern of the double-log models of real GDP in equation 3.2, 16 double-log real GDP models are re-estimated by means of the OLS method using the pertinent stationary as well as nonstationary log time series.

Estimation results of these 16 double-log real GDP models are presented in Table 3.8 in the appendix. There is empirical evidence of the estimated absolute values of elasticities of real GDP with respect to all variables other than the three variables
(real short-term external debt stock, total labour force, and real capital stock) being less than one in the case of most of the double-log real GDP models, thereby implying that real GDP is inelastic; or greater than one with respect to real short-term external debt stock, total labour force, and real capital stock in several double-log real GDP models, thereby implying that real GDP is elastic.

### 3.2.2 Long-run real GDP growth effects of the external debt growth variables

While all the above growth variables and the first-differenced growth rate of capital stock are stationary, not all their corresponding original underlying variables (logarithms of real GDP, real total external debt stock, real long-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, foreign direct investment net inflows, and total labour force) are stationary on the basis of the Phillips-Peron tests of nonstationarity at the 99% confidence level. Therefore, there arises a technical justification for testing the existence of cointegration among the above relevant growth variables for determining the long-run real GDP growth effects of the above four external debt growth variables via the Johansen cointegration test. The Johansen cointegration test, employing all the above relevant growth variables and the first-differenced growth rate of capital stock, is used to test the null hypothesis of no cointegrating vector for determining whether the possibility of the presence of a long-run stable equilibrium relationship exists among them.

The results of the Johansen’s multiple cointegration test, presented in Tables 3.9 and 3.10 in the appendix, are based on the use of five control variables (the growth rates
of real workers’ remittances and compensation of employees received, real foreign
direct investment net inflows, money and quasi money and total labour force, and the
first-differenced growth rate of the real capital stock). The results presented in Table
3.9 confirm the presence of cointegration, implying the existence of a long-run stable
positive equilibrium relationship especially between the above growth variables.

In Table 3.9 in the appendix, both the maximum-eigenvalue test and the trace test
indicate the existence of three cointegrating equations at the 0.05 significance level,
thereby confirming the robustness of the aforementioned empirical result indicating
the existence of a long-run stable equilibrium relationship among the relevant growth
variables, especially the growth rates of real GDP, real total external debt stock, real
long-term external debt stock, real short-term external debt stock, and total debt
servicing as a percentage of exports. Here it is pertinent to note that the maximum-
eigenvalue test is considered to be a more reliable in the case of small samples
(Adebiyi and Adeyemi, 2008).

For ensuring a clearer interpretation, especially of the real GDP growth effects of the
four external debt growth variables, cointegrating vectors are normalized with respect
to the growth rate of real GDP, and presented in Table 3.10 in the appendix.
Because of the unexpected signs of some of the normalized cointegrating coefficients
in the cases of one cointegrating equation and three cointegrating equations, it is
pertinent to interpret the normalized cointegrating coefficients associated with the
case of two cointegrating equations, which are based on the normalized cointegrating
coefficients presented in Table 3.10 and have associated with them a log-likelihood
value of 155.984. According to this cointegrating equation, which has the expected
signs of all the normalized cointegrating coefficients, only the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports, respectively, have the expected significant positive and negative long-run effects on the growth rate of the real GDP at the 5% significance level for the period 1981-2010.

More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of real long-term external debt stock culminated in an increase in the growth rate of real GDP, amounting to 0.575 units. The above empirical evidence of a significant positive long-run real GDP growth effect of the growth rate of real long-term external debt stock, confirms the existence of a positive long-run equilibrium relationship between the growth rate of the real GDP and the growth rate of real long-term external debt stock for Pakistan, thereby implying that the growth rate of the real GDP has been accelerated by the growth in the real long-term external debt stock during 1981-2010. This empirical result is plausible because substantial sums of the long-term external debt (for example, the World Bank loans) have been invested in economic growth-oriented infrastructural projects such as dams, roads, healthcare, and educational facilities of Pakistan. Moreover, the above cointegration equation implies that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in a decrease in the growth rate of real GDP, amounting to 0.152 units. The above empirical evidence of a significant negative long-run real GDP growth effect of the growth rate of total debt servicing as a percentage of exports signifies the phenomenon of external debt overhang in the long-run, and confirms the existence of a negative long-run
equilibrium relationship between the growth rate of real GDP and the growth rate of total debt servicing as a percentage of exports for Pakistan, thereby implying that the growth rate of real GDP has been decelerated by the growth in total debt servicing as a percentage of exports during 1981-2010. This empirical result is also plausible in light of the fact that Pakistan’s real GDP growth rate has continually declined since 1988, especially in the periods of her external debt crisis mainly due to her rising external debt burden (Husain 1999). This explanation is backed up by the following Pakistan-specific macroeconomic analysis of Husain (1999, p.357):

“Since 1988, Pakistan has negotiated successive agreements for achieving macroeconomic stabilization with the IMF…. The economic outcomes for this period — lower growth, stagnant exports, high rates of inflation and serious debt burden — are the manifestations of this phenomenon.”

In short, the above findings of mutually consistent positive short-run and long-run effects of the growth in real long-term external debt stock on the growth rate of real GDP as well as negative short-run and long-run real GDP growth effects of the growth in total debt servicing as a percentage of exports imply that the findings of the short-run real GDP growth effects of the above external debt growth variables give a sense of what one expects of the nature of long-run real GDP effects of the above external debt growth variables.

3.3 Conclusions and the policy recommendations

The above empirical econometric analysis focused on the role of four external debt growth variables in determining the growth rate of real GDP in both the short-run and long-run. The unit root tests of the pertinent times series of all the aforementioned growth variables confirmed the stationarity of the pertinent growth time series.
Moreover, the estimation results presented in Tables 3.4, 3.7, 3.9 and 3.10 lead to the following main conclusions regarding the real GDP growth effects of four external debt growth variables as well as control variables:

i) There is empirical evidence of a significant short-run positive effect of the growth rate of real total external debt stock on the growth rate of real GDP — a fact highlighted in the already presented brief history of Pakistan’s economy and literature review. The significant short-run positive real GDP growth effect of the growth rate of real total external debt stock observed in the four models (Models 2, 7, 8 and 14) in Table 3.4 in the case of the three control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock), as reflected in the four models (Models 2, 7, 8 and 14) in Table 3.7. This empirical evidence leads to a short-run policy recommendation of accelerating real GDP growth by ensuring the most judicious, strictly merit-based, equitable, transparent, and efficient allocation as well as investment of the requisite real total external debt stock only and only in the highly prioritized development projects (for example, power generations, small and large dams, roads, modern means of telecommunications and social infrastructure) of all sectors (agriculture, industry, and the services), provinces, and regions of the Pakistan’s economy for achieving the desirable patterns of sustainable balanced growth.
The above empirical evidence of the existence of a significant short-run positive effect of the growth rate of real total external debt stock on the growth rate of real GDP is consistent with a similar theoretical-cum-descriptive analyses by Gill and Pinto (2005) and Khan (1996), as well as with some of the similar empirical literature on the subject – for example, Siddiqui and Malik (2001). However, the methodology, variables (with the exception debt servicing/export ratio), and time period of the data set, and sources of data used by Siddiqui and Malik (2001) and the present empirical study in this thesis are different. For example, Siddiqui and Malik (2001) used OLS and Fixed Effects Models, growth rate of real GDP per capita, foreign debt/GDP ratio, data set for the period 1975-98, and data sources such as *International financial statistics year book-2000*, *Global development finance-2001* and *World debt tables*. However, the above empirical result of this thesis is different from the empirical evidence of a similar empirical study of Iqbal (1994), who found a significant negative effect of the structural adjustment lending of the IMF on Pakistan’s growth rate of real GDP during the period 1979-91. In contrast to these two empirical studies which did not include unit root tests-based econometric analyses of short-run and long-run effects, the present empirical study has extended the literature by using unit root tests for nonstationarity of the time series using the data obtained from the *World development indicators* 2012 for the period 1981-2012, a comprehensive set of stationary times series (including four different external debt growth time series instead of only one or two external debt growth time series), short-run econometric models,
Johansen’s multiple cointegration tests showing the existence of long-run stable equilibrium relationships among real GDP growth rate and four external debt growth variables, and a comprehensive set of control variables. In addition, the present empirical study in this thesis extends the literature by replicating the aforementioned empirical analysis for growth rates of sectoral real GDP shares as well as by presenting not only the analysis of vector autoregressive impulse responses of the growth rates of real GDP and four external debt growth variables but also the analysis of vector autoregressive impulse responses of the growth rates of sectoral real GDP shares and four external debt growth variables.

ii) There is empirical evidence – based on the estimation results of all the eighteen pertinent real GDP growth models – indicating the existence of a significant short-run positive effect of the growth rate of real long-term external debt stock on the growth rate of real GDP (a fact highlighted in the already presented brief history of Pakistan’s economy and literature review). A comparison of Tables 3.4 and 3.7 shows that the significant short-run positive real GDP growth effect of the growth rate of real long-term external debt stock observed in four real GDP growth models (Models 1, 3, 9 and 15) in Table 3.4 in the case of three control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is generally robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock) in the case of two out of
iii) There is no empirical evidence of any significant short-run effect of the growth rate of real short-term external debt stock on the growth rate of real GDP in the pertinent five real GDP growth models in Tables 3.4 and 3.7.

iv) There is empirical evidence of the existence of a significant short-run negative effect of the growth rate of total debt servicing as a percentage of exports on the growth rate of real GDP. In other words, the significant short-run negative real GDP growth effect of the growth rate of total debt servicing as a percentage of exports observed in all pertinent real GDP growth models in Table 3.4 in the case of the three control variables (the growth rate of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money) is robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock), as reflected in all pertinent real GDP growth models in Table 3.7. This empirical evidence confirms the existence of the phenomenon of external debt overhang in Pakistan’s economy — a fact highlighted in the already presented brief history of Pakistan’s economy and literature review — and is consistent with parts of the theoretical and empirical literature. This result, which occurs via both the
external debt-exports-growth channel and the crowding out effects on investment, is consistent with a similar empirical studies by Cunningham (1993) and Ahmed and Shakoor (2011). Like the present empirical study in this thesis, Cunningham (1993) used the growth rate of real GDP as the dependent variable by applying the OLS method. Unlike the present empirical study, Cunningham (1993) did not include unit root tests-based econometric analyses of short-run and long-run effects. Unlike the present empirical study, Ahmed and Shakoor (2011) included the growth rate of real GDP per capita as the dependent variable and only one external debt growth variable in the form of the growth rate of debt service burden along with the growth rate of population, investment and trade openness as explanatory variables using Pakistan’s official data set for the period 1980/81-2007/08. Like the present empirical study, Ahmed and Shakoor (2011) used root tests as well as the Johansen’s cointegration method to determine the nature of long-run relationships among the above variables. The above empirical evidence refutes a previous empirical finding that debt servicing is not a significant determinant of the growth in national output (Afzal, Hafeez-ur-Rehman and Jamshaid-ur-Rehman, 2009). In contrast to the present study in this thesis, Afzal, Hafeez-ur-Rehman and Jamshaid-ur-Rehman (2009) used a larger data set obtained from Pakistan Economic Survey for the period 1971/72-2007/08 and focused on the empirical examination of the export-led growth hypothesis by testing the causality between exports, economic growth and debt servicing.
v) In light of the Johansen’s multiple cointegration test results showing the existence of long-run stable equilibrium relationships among real GDP growth rate and four external debt growth variables, only the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports, respectively, have the expected significant positive and negative long-run effects on the growth rate of GDP at the 5% significance level for the period 1981-2010. A long-run policy recommendation based on the empirical evidence of the plausible significant positive short-run and long-run effects of the growth rate of real long-term total external debt on the growth rate of real GDP is that Government of Pakistan should accelerate the economic growth rate by simultaneously instituting a comprehensive fiscal austerity-oriented package of long-term fundamental fiscal, constitutional, and administrative reforms. On one hand, this reform package is recommended to be designed to strictly and transparently implement constitutional ceilings on fiscal deficits and domestic/external debt for ensuring fiscal discipline\(^5\), to increase the national savings rate through fiscal incentives, and to institute a judicious and efficient policy mix of financing public expenditures by means of external debt finance and equity finance. On the other hand, this reform package is recommended to be designed for reinforcing the above short-run policy of

\(^5\) For example, borrowing only and only in case of its absolute necessity and the elimination of all unnecessary non-development public expenditures, such as the public expenditures for providing public subsidies to the wealthy industrialists and farmers, the public expenditures on the private foreign trips of the very important persons of the Government of Pakistan, and the public expenditures on lavish illumination of highways and official buildings with electric floodlights in Islamabad for welcoming foreign dignitaries, in spite of the contemporary general scarcity of electricity in the country due to the ongoing serious national power crisis.
promoting an equitable-cum-efficient allocation of real long-term total external debt stock among the prospective investors in both public and private sector investment projects and ensuring efficient investment of the real long-term external debt stock by its beneficiaries.

Keeping in view the historical facts of financial corruption as well as the inefficient and unproductive use of external debt in Pakistan\(^6\), another important policy recommendation based on the above empirical evidence is to ensure a transparent corruption/waste (use of external debt for financing non-productive current expenditures)-free merit-based efficient allocation of long-term external debt among all sectors of economy, especially in their long-term economic and social infrastructural projects (roads, dams, irrigation networks, renewable energy, electricity generation, public education as well as health, and sanitation) for realizing synergy among them, increasing factor productivity, and, thereby, achieving the highest attainable sustainable growth rate of real GDP in Pakistan.

In short, the above results confirmed the robustness of a significant positive real GDP growth effect of the growth rate of real long-term external debt stock and a significant negative real GDP growth effect of the growth rate of total debt servicing as a percentage of exports signifying external debt overhang in both the short and long-run.

\(^6\) (Iqbal, 1994), (Papanek, 1996), and (Kemal, 2001).
vi) As expected in light of a brief history of Pakistan’s economy and literature review, there is empirical evidence of the existence of a significant short-run positive effect (only in Real GDP Growth Model 5) of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of real GDP in real GDP growth models in Tables 3.4 and 3.7. These results of Table 3.4 are generally robust to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock) in Table 3.7. This empirical evidence leads to a policy recommendation that the Government of Pakistan can accelerate the growth rate of real GDP by simultaneously increasing investment in programs of human capital formation and growth in foreign employment opportunities for both the skilled and unskilled Pakistani workers in the whole world in general and in the labour-deficient regions of the Middle East. The above empirical evidence is in sharp contrast to the previously documented empirical fact of the insignificant negative effect of remittances on Pakistan’s real output growth, as found by Kandil and Mirzaie (2008). In contrast to the present study in this thesis, Kandil and Mirzaie (2008) used two-stage least squares method and the data set for the period 1975-2003.

vii) As expected in light of a brief history of Pakistan’s economy and literature review, there is empirical evidence of the existence of a significant short-run positive effect of the growth rate of real foreign direct investment (FDI) net inflows on the growth rate of real GDP in all pertinent thirteen real GDP growth models in both Tables 3.4 and 3.7, implying robustness of the
significant short-run positive effect of the growth rate of real foreign direct investment net inflows on the growth rate of real GDP documented in Table 3.4 to the inclusion of two additional control variables (the growth rate of the total labour force and the first-differenced growth rate of real capital stock) in the case of Table 3.7. While this empirical result is consistent with both the theoretical and empirical literature which portrays positive effects of FDI on real GDP growth via the FDI-induced relaxation of the national economic capacity constraints (Kandil and Mirzaie, 2008), it contradicts Kandil and Mirzaie (2008) finding that there is no empirical evidence of a positive effect of FDI flows on real output growth in the case of Pakistan (Kandil and Mirzaie, 2008). It is historical fact that Government of Pakistan had been mostly using external debt instead of foreign private investment for financing its balance of payments deficits. Against this background, a pertinent policy recommendation based on the above empirical evidence of both external debt overhang and significant positive effect of FDI flows on the growth rate of real GDP is that the Government of Pakistan can alleviate its external debt crisis by ensuring maximum possible inflows of FDI for generating sufficient income to service the external debt, pay profits to the foreign investors, accelerate the growth of output and exports, and accumulate large foreign exchange reserves — a pragmatic structural solution of the external debt crisis initially advocated by Papanek (1996) and later endorsed by Todaro and Smith (2009). Because of the general tendency of Government of Pakistan to resort to fiscal deficits by

7 Kemal (2001).
incurring excessive amounts of external debt mainly because of lack of accountability of the concerned government officials and politicians, Pakistan’s economy has become a black hole economy for external debt as there is lack of transparency in the processes of external debt-related decision making and the use of external debt. An alternative short-run policy recommendation based on the external debt overhang caused by the Pakistan’s unsustainable burden of debt servicing is to radically reduce the external debt stock through comprehensive macroeconomic reforms for minimizing the external debt burden. But the success of a short-run policy recommendation of external debt reduction is quite unlikely. On the basis of a comparison between the policy of accelerating real GDP growth by means of external debt stock, which inevitably involves the burden of debt servicing as well as the external debt overhang, and the policy of accelerating real GDP growth by means of increasing inflows of FDI, the policy of accelerating real GDP growth by increasing the inflows of FDI has greater economic rationale.

In general, overall empirical results belonging to Table 3.4 were robust to the inclusion of two additional control variables — the growth rate of the total labour force and the first-differenced growth rate of real capital stock, as depicted in Table 3.7.

In short, the above empirical econometric analysis of the determinants of the growth rates of real GDP has generally confirmed certain Pakistan-specific historical facts about the actual significant negative real GDP growth effects of growth in debt servicing burden in the form of external debt overhang and significant positive real
GDP growth effects of the growth in external debt (in the form of either real total external debt stock or real long term external debt stock), real workers’ remittances and compensation of employees received, and real foreign direct investment net inflows. History of Pakistan’s economy, pertinent literature review, and empirical evidence have confirmed that external debt, real workers’ remittances and compensation of employees received, and real foreign direct investment net inflows were significant determinants of Pakistan’s growth rate of real GDP.

A limitation of this empirical study is the small dataset covering the period 1981-2010 — a practical manifestation of a “small samples problem”, which is usually encountered in applied macroeconomics because macroeconomic variables, such as budget deficits, are generally measured on yearly basis (Brooks, 2008, p. 2). Therefore, there is scope for overcoming the aforementioned limitation and, thereby, improving the estimation results of the real GDP growth models by replicating the above empirical study in the future using a larger dataset and covering a longer time period than the above 30-year study.
### Variable Names, Acronyms, and Data Sources

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Acronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic product</td>
<td>GDP</td>
</tr>
<tr>
<td>Gross domestic product deflator (annual %)</td>
<td>GDPD</td>
</tr>
<tr>
<td>Real gross domestic product</td>
<td>RGDP</td>
</tr>
<tr>
<td>Log of real gross domestic product</td>
<td>LOG_RGDP</td>
</tr>
<tr>
<td>Growth rate of real gross domestic product</td>
<td>DLOG_RGDP</td>
</tr>
<tr>
<td>Total external debt stocks (Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt)</td>
<td>TEDS</td>
</tr>
<tr>
<td>Real total external debt stocks</td>
<td>RTEDS</td>
</tr>
<tr>
<td>Log of real total external debt stocks</td>
<td>LOG_RTEDS</td>
</tr>
<tr>
<td>Growth rate of real total external debt stocks</td>
<td>DLOG_RTEDS</td>
</tr>
<tr>
<td>Long-term external debt stock (Long-term external debt stock is the public and publicly guaranteed debt which comprises long-term external obligations of public debtors, including the national government, political subdivisions (or an agency of either), and autonomous public bodies, and external obligations of private debtors that are guaranteed for repayment by a public entity)</td>
<td>LTEDS</td>
</tr>
<tr>
<td>Real long-term external debt stock</td>
<td>RLTEDS</td>
</tr>
<tr>
<td>Log of real long-term external debt stock</td>
<td>LOG_RLTEDS</td>
</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>DLOG_RLTEDS</td>
</tr>
<tr>
<td>Short-term external debt (Short-term external debt is defined as debt that has an original maturity of one year or less.)</td>
<td>STED</td>
</tr>
<tr>
<td>Real short-term external debt</td>
<td>RSTED</td>
</tr>
<tr>
<td>Log of real short-term external debt</td>
<td>LOG_RSTED</td>
</tr>
<tr>
<td>Growth rate of real short-term external debt</td>
<td>DLOG_RSTED</td>
</tr>
<tr>
<td>Total external debt servicing as a percentage of exports (of goods, services, income)</td>
<td>TEDSAPOE</td>
</tr>
<tr>
<td>Log of total external debt servicing as percentage of exports</td>
<td>LOG_TEDSAPOE</td>
</tr>
<tr>
<td>Growth rate of total external debt servicing as percentage of exports</td>
<td>DLOG_TEDSAPOE</td>
</tr>
<tr>
<td>Workers’ remittances and compensation of employees received</td>
<td>WRARCGRDPR</td>
</tr>
<tr>
<td>Real workers’ remittances and compensation of employees received</td>
<td>RWRAWRARCGRDPR</td>
</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>DLOG_RWRAWCGRDPR</td>
</tr>
<tr>
<td>Foreign direct investment net inflows</td>
<td>FDINI</td>
</tr>
<tr>
<td>Real foreign direct investment net inflows</td>
<td>RDFINI</td>
</tr>
<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>LOG_RFDFINI</td>
</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>DLOG_RFDFINI</td>
</tr>
</tbody>
</table>
Table 3.1 Variables Names, Acronyms, and Data Sources

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Acronym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money and quasi money growth rate</td>
<td>MAQMGRR</td>
</tr>
<tr>
<td>Log of money and quasi money growth rate</td>
<td>LOG_MAEQMGRR</td>
</tr>
<tr>
<td>Total labour force</td>
<td>TLF</td>
</tr>
<tr>
<td>Log of total labour force</td>
<td>LOG_TLF</td>
</tr>
<tr>
<td>Growth rate of the total labour force</td>
<td>DLOG_TLF</td>
</tr>
<tr>
<td>Gross capital formation as % of GDP</td>
<td>GCFAPOGDP</td>
</tr>
<tr>
<td>Initial capital stock</td>
<td>k₀</td>
</tr>
<tr>
<td>Depreciation rate of capital stock</td>
<td>Δ</td>
</tr>
<tr>
<td>Real capital stock</td>
<td>RKS</td>
</tr>
<tr>
<td>Log of real capital stock</td>
<td>LOG_RKS</td>
</tr>
<tr>
<td>Growth rate of real capital stock</td>
<td>DLOG_RKS</td>
</tr>
<tr>
<td>The first-differenced growth rate of real capital stock</td>
<td>DDLOG_RKS</td>
</tr>
<tr>
<td>Agriculture’s share of real GDP</td>
<td>AGSOGDP</td>
</tr>
<tr>
<td>Log of agriculture’s share of real GDP</td>
<td>LOG_AGSOGDP</td>
</tr>
<tr>
<td>Growth rate of agriculture’s share of real GDP</td>
<td>DLOG_AGSOGDP</td>
</tr>
<tr>
<td>Industry’s share of real GDP</td>
<td>INSOGDP</td>
</tr>
<tr>
<td>Log of industry’s share of real GDP</td>
<td>LOG_INSOGDP</td>
</tr>
<tr>
<td>Growth rate of industry’s share of real GDP</td>
<td>DLOG_INSOGDP</td>
</tr>
<tr>
<td>Services’ share of real GDP</td>
<td>SESOGDP</td>
</tr>
<tr>
<td>Log of the services’ share of real GDP</td>
<td>LOG_SESOGDP</td>
</tr>
<tr>
<td>Growth rate of the services’ share of real GDP</td>
<td>DLOG_SESOGDP</td>
</tr>
<tr>
<td>Pakistani rupees per US dollar exchange rate (end of the year 1980 average exchange rate = Pak Rs. 9.9 per US $)</td>
<td>PKRUSDER</td>
</tr>
</tbody>
</table>

### Table 3.2 Descriptive Statistics of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Standard Deviation</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross capital formation as percent of GDP</td>
<td>0.19</td>
<td>0.19</td>
<td>0.23</td>
<td>0.16</td>
<td>0.02</td>
<td>30</td>
</tr>
<tr>
<td>GDP deflator</td>
<td>9.48</td>
<td>8.65</td>
<td>25.9</td>
<td>2.5</td>
<td>4.84</td>
<td>30</td>
</tr>
<tr>
<td>Money and quasi money growth rate</td>
<td>0.15</td>
<td>0.16</td>
<td>0.29</td>
<td>0.04</td>
<td>0.06</td>
<td>30</td>
</tr>
<tr>
<td>Real foreign direct investment net inflows (Million US$)</td>
<td>115</td>
<td>44.2725</td>
<td>726</td>
<td>5.5579</td>
<td>160</td>
<td>30</td>
</tr>
<tr>
<td>Real gross domestic product (Million US$)</td>
<td>8720</td>
<td>7170</td>
<td>28900</td>
<td>2840</td>
<td>6040</td>
<td>30</td>
</tr>
<tr>
<td>Real GDP share of agriculture</td>
<td>0.25</td>
<td>0.26</td>
<td>0.32</td>
<td>0.2</td>
<td>0.03</td>
<td>30</td>
</tr>
<tr>
<td>Real GDP share of industry</td>
<td>0.24</td>
<td>0.24</td>
<td>0.27</td>
<td>0.22</td>
<td>0.02</td>
<td>30</td>
</tr>
<tr>
<td>Real GDP share of services</td>
<td>0.5</td>
<td>0.5</td>
<td>0.55</td>
<td>0.46</td>
<td>0.02</td>
<td>30</td>
</tr>
<tr>
<td>Real capital stock (Million US$)</td>
<td>970000</td>
<td>662000</td>
<td>3010000</td>
<td>163000</td>
<td>822000</td>
<td>30</td>
</tr>
<tr>
<td>Real long-term external debt stock (Million US$)</td>
<td>2960</td>
<td>2410</td>
<td>11200</td>
<td>858</td>
<td>2100</td>
<td>30</td>
</tr>
<tr>
<td>Real short-term external debt (Million US$)</td>
<td>253</td>
<td>228</td>
<td>616</td>
<td>60.9932</td>
<td>150</td>
<td>30</td>
</tr>
<tr>
<td>Real total external debt stocks (Million US$)</td>
<td>3590</td>
<td>3000</td>
<td>13400</td>
<td>1060</td>
<td>2470</td>
<td>30</td>
</tr>
<tr>
<td>Real workers’ remittances and compensation of employees received (Million US$)</td>
<td>396</td>
<td>271</td>
<td>1420</td>
<td>43.1727</td>
<td>313</td>
<td>30</td>
</tr>
<tr>
<td>Total external debt servicing as percent of exports (of goods, services, income)</td>
<td>0.27</td>
<td>0.28</td>
<td>0.40</td>
<td>0.11</td>
<td>0.09</td>
<td>30</td>
</tr>
<tr>
<td>Total labour force (Millions)</td>
<td>38.6097</td>
<td>35.6706</td>
<td>59.3531</td>
<td>24.4284</td>
<td>10.5461</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>0.1</td>
<td>0.19</td>
<td>1.92</td>
<td>-1.99</td>
<td>0.82</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real gross domestic product</td>
<td>0.06</td>
<td>0.15</td>
<td>1.15</td>
<td>-1.28</td>
<td>0.57</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real capital stock</td>
<td>0.1</td>
<td>0.1</td>
<td>0.09</td>
<td>-0.1</td>
<td>0.01</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>0.06</td>
<td>0.15</td>
<td>1.21</td>
<td>-1.48</td>
<td>0.61</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real short-term external debt</td>
<td>0.03</td>
<td>0.08</td>
<td>1.31</td>
<td>-1.63</td>
<td>0.72</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>0.06</td>
<td>0.13</td>
<td>1.21</td>
<td>-1.47</td>
<td>0.61</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>0.06</td>
<td>0.08</td>
<td>2.04</td>
<td>-1.36</td>
<td>0.7</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of total external debt servicing as a percentage of exports (of goods, services, income)</td>
<td>-0.02</td>
<td>0.00</td>
<td>0.30</td>
<td>-0.76</td>
<td>0.23</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of the total labour force</td>
<td>0.07</td>
<td>0.03</td>
<td>0.06</td>
<td>0.01</td>
<td>0.01</td>
<td>28</td>
</tr>
<tr>
<td>Growth rate of real GDP share of agriculture</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.10</td>
<td>-0.08</td>
<td>0.04</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real GDP share of industry</td>
<td>0.00</td>
<td>0.00</td>
<td>0.12</td>
<td>-0.12</td>
<td>0.04</td>
<td>29</td>
</tr>
<tr>
<td>Growth rate of real GDP share of services</td>
<td>0.01</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.04</td>
<td>0.02</td>
<td>29</td>
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</table>
Table 3.2.1 Correlation between external debt variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Real total external debt stock</th>
<th>Real long-term external debt stock</th>
<th>Real short-term external debt</th>
<th>Total debt servicing as a percentage of exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real total external debt stock</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real long-term external debt stock</td>
<td>0.995** (51.001) [0.000]</td>
<td>1.000</td>
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</tr>
<tr>
<td>Real short-term external debt</td>
<td>0.451** (2.670) [0.013]</td>
<td>0.421** (2.454) [0.021]</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Total debt servicing as a percentage of exports</td>
<td>-0.330 (-1.850) [0.075]</td>
<td>-0.348 (-1.963) [0.066]</td>
<td>0.224 (1.214) [0.235]</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Notes: Figures outside parentheses are Spearman rank-order correlation coefficients. Figures in ( ) are t-statistics and figures in [ ] are probabilities. **95%.

Table 3.3 Results of Unit Root Tests of Stationarity of Variables in Levels

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test Statistic</th>
<th>PP Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of real gross domestic product</td>
<td>-7.538***</td>
<td>-8.521***</td>
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<tr>
<td>Growth rate of real total external debt stock</td>
<td>-7.367***</td>
<td>-11.409***</td>
</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>-7.361***</td>
<td>-10.214***</td>
</tr>
<tr>
<td>Growth rate of real short-term external debt stock</td>
<td>-6.671***</td>
<td>-7.583***</td>
</tr>
<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-6.881***</td>
<td>-6.860***</td>
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<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>-6.086***</td>
<td>-6.371***</td>
</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>-6.633***</td>
<td>-7.656***</td>
</tr>
<tr>
<td>Money and quasi money growth rate</td>
<td>-4.219***</td>
<td>-4.406***</td>
</tr>
<tr>
<td>Growth rate of the total labour force</td>
<td>-4.920***</td>
<td>-4.920***</td>
</tr>
<tr>
<td>Growth rate of real capital stock</td>
<td>-0.477</td>
<td>-1.143</td>
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<tr>
<td>The first-differenced growth rate of real capital stock</td>
<td>-1.473</td>
<td>-7.963***</td>
</tr>
</tbody>
</table>

Notes: ADF stands for Augmented Dickey-Fuller; PP stands for Phillips-Peron; ***99%, **95%, and *90%
Table 3.4 Estimation Results of Short Run Real GDP Growth Models

Dependent Variable: Growth rate of real gross domestic product

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>-0.004 (0.450)</td>
<td>0.799*** (0.072)</td>
<td>0.155 (0.391)</td>
<td>0.824*** (0.093)</td>
<td>0.801*** (0.067)</td>
<td>0.048 (0.494)</td>
<td>0.220 (0.364)</td>
<td>0.821*** (0.086)</td>
<td>0.288 (0.359)</td>
<td>0.384 (0.364)</td>
<td>0.75*** (0.075)</td>
<td>0.638 (0.425)</td>
<td>0.151 (0.461)</td>
<td>0.089 (0.054)</td>
<td>0.268*** (0.089)</td>
<td>-0.125** (0.057)</td>
</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>0.896** (0.421)</td>
<td>0.799*** (0.068)</td>
<td>0.645 (0.387)</td>
<td>0.751*** (0.081)</td>
<td>0.799*** (0.063)</td>
<td>0.729 (0.456)</td>
<td>0.384 (0.359)</td>
<td>0.75*** (0.075)</td>
<td>0.638 (0.425)</td>
<td>0.151 (0.461)</td>
<td>0.089 (0.054)</td>
<td>0.268*** (0.089)</td>
<td>-0.125** (0.057)</td>
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<tr>
<td>Growth rate of real short-term external debt stock</td>
<td>0.054 (0.054)</td>
<td>0.268*** (0.089)</td>
<td>-0.026 (0.054)</td>
<td>0.026 (0.048)</td>
<td>0.268*** (0.089)</td>
<td>0.022 (0.060)</td>
<td>-0.028 (0.050)</td>
<td>0.025 (0.044)</td>
<td>0.014 (0.056)</td>
<td>0.025 (0.044)</td>
<td>0.014 (0.056)</td>
<td>0.025 (0.044)</td>
<td>0.014 (0.056)</td>
<td>0.025 (0.044)</td>
<td>0.014 (0.056)</td>
<td>0.025 (0.044)</td>
</tr>
<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-1.12 (0.151)</td>
<td>-0.128** (0.057)</td>
<td>-0.158** (0.055)</td>
<td>0.729 (0.456)</td>
<td>0.384 (0.359)</td>
<td>0.75*** (0.075)</td>
<td>0.638 (0.425)</td>
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</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>0.035 (0.055)</td>
<td>0.045 (0.055)</td>
<td>0.420*** (0.085)</td>
<td>0.399*** (0.079)</td>
<td>0.041 (0.057)</td>
<td>0.012 (0.060)</td>
<td>0.045 (0.055)</td>
<td>0.045 (0.055)</td>
<td>0.055 (0.051)</td>
<td>0.480*** (0.087)</td>
<td>0.044 (0.053)</td>
<td>0.040 (0.056)</td>
<td>0.042 (0.056)</td>
<td>0.035 (0.052)</td>
<td>0.051 (0.054)</td>
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</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>0.079** (0.029)</td>
<td>0.069** (0.025)</td>
<td>0.115 (0.063)</td>
<td>0.189** (0.068)</td>
<td>0.078** (0.028)</td>
<td>0.083*** (0.031)</td>
<td>0.064** (0.029)</td>
<td>0.055* (0.027)</td>
<td>0.100 (0.065)</td>
<td>0.065* (0.032)</td>
<td>0.056** (0.029)</td>
<td>0.068** (0.029)</td>
<td>0.051* (0.035)</td>
<td>0.054* (0.030)</td>
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</tr>
<tr>
<td>Money and quasi money growth rate</td>
<td>0.180 (0.240)</td>
<td>0.142 (0.227)</td>
<td>-0.100 (0.502)</td>
<td>0.035 (0.591)</td>
<td>0.150 (0.232)</td>
<td>0.194 (0.245)</td>
<td>0.204 (0.225)</td>
<td>0.131 (0.231)</td>
<td>0.219 (0.214)</td>
<td>-0.028 (0.512)</td>
<td>0.135 (0.240)</td>
<td>0.232 (0.218)</td>
<td>0.279 (0.230)</td>
<td>0.260 (0.218)</td>
<td>0.222 (0.227)</td>
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</tr>
<tr>
<td>C</td>
<td>0.011 (0.013)</td>
<td>-0.021 (0.039)</td>
<td>-0.013 (0.036)</td>
<td>0.035 (0.081)</td>
<td>0.005 (0.095)</td>
<td>-0.014 (0.040)</td>
<td>-0.024 (0.040)</td>
<td>-0.010 (0.037)</td>
<td>-0.005 (0.034)</td>
<td>0.025 (0.082)</td>
<td>-0.011 (0.039)</td>
<td>-0.028 (0.035)</td>
<td>-0.088 (0.037)</td>
<td>-0.023 (0.035)</td>
<td>-0.026 (0.037)</td>
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</tr>
<tr>
<td>Adjusted R²</td>
<td>0.784</td>
<td>0.968</td>
<td>0.931</td>
<td>0.909</td>
<td>0.966</td>
<td>0.984</td>
<td>0.979</td>
<td>0.986</td>
<td>0.984</td>
<td>0.984</td>
<td>0.988</td>
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<td>0.988</td>
<td>0.989</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%.
Table 3.4.1 The OLS Residual and Stability Diagnostics

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<tbody>
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<td>M1</td>
<td>0.282</td>
<td>0.8683</td>
<td>0.1804</td>
<td>0.1236</td>
<td>0.8462</td>
<td>0.8145</td>
<td>0.2945</td>
<td>0.6760</td>
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<td>M2</td>
<td>0.695</td>
<td>0.7065</td>
<td>0.8403</td>
<td>0.7965</td>
<td>0.9210</td>
<td>0.9015</td>
<td>0.3035</td>
<td>0.4628</td>
</tr>
<tr>
<td>M3</td>
<td>0.501</td>
<td>0.7784</td>
<td>0.4849</td>
<td>0.5972</td>
<td>0.9582</td>
<td>0.9468</td>
<td>0.5229</td>
<td>0.4658</td>
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<tr>
<td>M4</td>
<td>2.157</td>
<td>0.3402</td>
<td>0.3168</td>
<td>0.2373</td>
<td>0.1924</td>
<td>0.1792</td>
<td>0.5510</td>
<td>0.0484</td>
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<tr>
<td>M5</td>
<td>1.264</td>
<td>0.5314</td>
<td>0.7537</td>
<td>0.6922</td>
<td>0.0998</td>
<td>0.1003</td>
<td>0.8272</td>
<td>0.2455</td>
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<td>M6</td>
<td>0.462</td>
<td>0.7939</td>
<td>0.5594</td>
<td>0.4582</td>
<td>0.9799</td>
<td>0.9717</td>
<td>0.4033</td>
<td>0.5092</td>
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<td>M7</td>
<td>0.480</td>
<td>0.7867</td>
<td>0.7578</td>
<td>0.6852</td>
<td>0.9537</td>
<td>0.9356</td>
<td>0.2647</td>
<td>0.3677</td>
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<td>M8</td>
<td>1.016</td>
<td>0.6617</td>
<td>1.0000</td>
<td>0.2079</td>
<td>0.8540</td>
<td>0.8152</td>
<td>0.5102</td>
<td>0.7744</td>
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<tr>
<td>M9</td>
<td>0.767</td>
<td>0.6816</td>
<td>0.6319</td>
<td>0.5378</td>
<td>0.9609</td>
<td>0.9543</td>
<td>0.4026</td>
<td>0.5743</td>
</tr>
<tr>
<td>M10</td>
<td>0.272</td>
<td>0.8728</td>
<td>0.0831</td>
<td>0.0469</td>
<td>0.9426</td>
<td>0.9226</td>
<td>0.3224</td>
<td>0.5797</td>
</tr>
<tr>
<td>M11</td>
<td>1.519</td>
<td>0.4234</td>
<td>0.4336</td>
<td>0.3308</td>
<td>0.1053</td>
<td>0.1068</td>
<td>0.7403</td>
<td>0.0128</td>
</tr>
<tr>
<td>M12</td>
<td>0.713</td>
<td>0.7002</td>
<td>0.6293</td>
<td>0.5188</td>
<td>0.0440</td>
<td>0.0193</td>
<td>0.3913</td>
<td>0.4543</td>
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<td>M13</td>
<td>0.487</td>
<td>0.7840</td>
<td>0.1655</td>
<td>0.0919</td>
<td>0.9389</td>
<td>0.9125</td>
<td>0.2978</td>
<td>0.6462</td>
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<td>M14</td>
<td>0.764</td>
<td>0.6825</td>
<td>0.2128</td>
<td>0.1251</td>
<td>0.9538</td>
<td>0.9292</td>
<td>0.2798</td>
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<td>M15</td>
<td>0.270</td>
<td>0.8735</td>
<td>0.1172</td>
<td>0.0609</td>
<td>0.9688</td>
<td>0.9532</td>
<td>0.2768</td>
<td>0.7583</td>
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<td>M16</td>
<td>0.380</td>
<td>0.8272</td>
<td>0.1562</td>
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<td>0.9106</td>
<td>0.8688</td>
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<td>0.7131</td>
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</table>

Table 3.5 Results of Unit Root Tests of Stationarity of Variables in Levels

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test Statistic</th>
<th>PP Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of real gross domestic product</td>
<td>-1.211</td>
<td>-2.652**</td>
</tr>
<tr>
<td>Log of real long-term external debt stock</td>
<td>-3.366**</td>
<td>-3.452**</td>
</tr>
<tr>
<td>Log of real short-term external debt stock</td>
<td>-3.440**</td>
<td>-3.521**</td>
</tr>
<tr>
<td>Log of total debt servicing as a percentage of exports</td>
<td>-1.288</td>
<td>-1.267</td>
</tr>
<tr>
<td>Log of real workers' remittances and compensation of employees received</td>
<td>-1.888</td>
<td>-1.807</td>
</tr>
<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>-2.340</td>
<td>-2.401</td>
</tr>
<tr>
<td>Log of Money and quasi money growth rate</td>
<td>-4.416***</td>
<td>-5.369***</td>
</tr>
<tr>
<td>Log of total labour force</td>
<td>1.461</td>
<td>1.661</td>
</tr>
<tr>
<td>Log of real capital stock</td>
<td>-7.282**</td>
<td>-5.110**</td>
</tr>
</tbody>
</table>

Notes: ADF stands for Augmented Dickey-Fuller; PP stands for Phillips-Perron, **99%, *95%, and *90%
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>0.541</td>
<td>0.557**</td>
<td>0.560**</td>
<td>0.362</td>
<td>0.760***</td>
<td>0.724***</td>
<td>0.165</td>
<td>-0.122</td>
<td>0.811***</td>
<td>0.369</td>
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<tr>
<td>Log of real long-term external debt stock</td>
<td>0.404</td>
<td>0.606***</td>
<td>0.964**</td>
<td>-0.362</td>
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<tr>
<td>Log of real short-term external debt stock</td>
<td>-0.097*</td>
<td>0.115*</td>
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<td>-0.140***</td>
<td>-0.112***</td>
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<tr>
<td>Log of total debt servicing as a percentage</td>
<td>-0.243***</td>
<td>0.313***</td>
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<tr>
<td>of exports</td>
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<tr>
<td>Log of real workers' remittances and</td>
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<td>0.197***</td>
<td>0.540***</td>
<td>0.198***</td>
<td>0.157***</td>
<td>0.186***</td>
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<td>0.158***</td>
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<tr>
<td>compensation of employees received</td>
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<tr>
<td>Log of real direct investment net inflows</td>
<td>0.144***</td>
<td>0.144***</td>
<td>0.294***</td>
<td>0.126***</td>
<td>0.106***</td>
<td>0.064*</td>
<td>0.047**</td>
<td>0.047**</td>
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<td>0.047**</td>
<td>0.047**</td>
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<tr>
<td>Log of money and quasi money growth rate</td>
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<td>-0.024</td>
<td>-0.047</td>
<td>-0.020</td>
<td>-0.006</td>
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<td>Adjusted R2</td>
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Notes: Figures in parentheses are standard errors; **99%, *95%, and *90%.
## Table 3.7 Estimation Results of Real GDP Growth Models

**Dependent Variable: Growth rate of real gross domestic product**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Original Model 1</th>
<th>New Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>0.024** (0.480)</td>
<td>0.019 (0.552)</td>
<td>0.795*** (0.077)</td>
<td>0.105 (0.418)</td>
<td>0.105*** (0.101)</td>
<td>0.105*** (0.072)</td>
<td>0.105*** (0.080)</td>
<td>0.105*** (0.064)</td>
<td>0.105*** (0.056)</td>
<td>0.105*** (0.057)</td>
<td>0.105*** (0.061)</td>
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<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>0.069** (0.421)</td>
<td>0.115 (0.510)</td>
<td>0.162*** (0.070)</td>
<td>0.084 (0.407)</td>
<td>0.104*** (0.080)</td>
<td>0.115*** (0.064)</td>
<td>0.105*** (0.056)</td>
<td>0.105*** (0.054)</td>
<td>0.105*** (0.051)</td>
<td>0.105*** (0.052)</td>
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<tr>
<td>Growth rate of real short-term external debt stock</td>
<td>0.094 (0.054)</td>
<td>0.001 (0.075)</td>
<td>0.238*** (0.102)</td>
<td>0.001 (0.062)</td>
<td>0.105 (0.056)</td>
<td>0.203** (0.101)</td>
<td>0.004 (0.084)</td>
<td>0.000 (0.059)</td>
<td>0.000 (0.051)</td>
<td>0.001 (0.078)</td>
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<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-0.129** (0.057)</td>
<td>-0.117* (0.062)</td>
<td>-0.169 (0.064)</td>
<td>-0.124* (0.062)</td>
<td>-0.129** (0.057)</td>
<td>-0.179 (0.141)</td>
<td>-0.124** (0.099)</td>
<td>-0.115* (0.061)</td>
<td>-0.129** (0.061)</td>
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<tr>
<td>Growth rate of real workers' remittances and compensation of employees received</td>
<td>0.015 (0.063)</td>
<td>0.014 (0.057)</td>
<td>0.412*** (0.092)</td>
<td>0.029 (0.061)</td>
<td>0.006 (0.063)</td>
<td>0.037 (0.066)</td>
<td>0.033 (0.099)</td>
<td>0.006 (0.055)</td>
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<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>0.079** (0.031)</td>
<td>0.079** (0.031)</td>
<td>0.149*** (0.071)</td>
<td>0.212* (0.076)</td>
<td>0.032 (0.052)</td>
<td>0.017** (0.051)</td>
<td>0.037 (0.053)</td>
<td>0.067** (0.029)</td>
<td>0.134* (0.071)</td>
<td>0.080* (0.054)</td>
<td>0.067** (0.030)</td>
<td>0.067** (0.030)</td>
<td>0.067** (0.030)</td>
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<tr>
<td>Money and quasi money growth rate</td>
<td>0.140 (0.250)</td>
<td>0.120 (0.254)</td>
<td>0.084 (0.538)</td>
<td>0.122 (0.632)</td>
<td>0.125 (0.240)</td>
<td>0.182 (0.245)</td>
<td>0.124 (0.240)</td>
<td>0.124 (0.220)</td>
<td>0.101 (0.250)</td>
<td>0.148 (0.226)</td>
<td>0.125 (0.226)</td>
<td>0.273 (0.227)</td>
<td>0.245 (0.235)</td>
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<tr>
<td>Growth rate of the total labour force</td>
<td>-0.426 (1.516)</td>
<td>-0.003 (1.526)</td>
<td>0.578 (1.415)</td>
<td>-1.935 (3.674)</td>
<td>-0.490 (1.490)</td>
<td>-0.127 (1.464)</td>
<td>-0.156 (1.435)</td>
<td>-0.605 (1.308)</td>
<td>-0.927 (1.521)</td>
<td>-0.354 (1.527)</td>
<td>-0.830 (1.460)</td>
<td>-0.444 (1.530)</td>
<td>-0.806 (1.426)</td>
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<tr>
<td>The first-differenced growth rate of real capital stock</td>
<td>0.807 (0.801)</td>
<td>4.994 (0.567)</td>
<td>2.169 (13.013)</td>
<td>-13.529 (15.196)</td>
<td>2.506 (5.338)</td>
<td>6.910 (5.392)</td>
<td>1.376 (8.308)</td>
<td>2.539 (0.348)</td>
<td>1.002 (5.344)</td>
<td>-0.812 (13.473)</td>
<td>1.364 (7.401)</td>
<td>6.109 (6.625)</td>
<td>0.709 (8.007)</td>
<td>0.547 (7.428)</td>
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<tr>
<td>Adjusted R²</td>
<td>0.586</td>
<td>0.385</td>
<td>0.584</td>
<td>0.921</td>
<td>0.094</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%
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<tbody>
<tr>
<td>M1</td>
<td>0.103</td>
<td>0.9498</td>
<td>0.1315</td>
<td>0.0656</td>
<td>0.8554</td>
<td>0.8043</td>
<td>0.2689</td>
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<tr>
<td>M2</td>
<td>0.541</td>
<td>0.7580</td>
<td>0.9024</td>
<td>0.8122</td>
<td>0.8084</td>
<td>0.8571</td>
<td>0.6090</td>
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<tr>
<td>M3</td>
<td>0.750</td>
<td>0.6871</td>
<td>0.7010</td>
<td>0.8530</td>
<td>0.8954</td>
<td>0.8533</td>
<td>0.4800</td>
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<td>M4</td>
<td>4.670</td>
<td>0.0968</td>
<td>0.5038</td>
<td>0.3716</td>
<td>0.7894</td>
<td>0.7282</td>
<td>0.5870</td>
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<tr>
<td>M5</td>
<td>0.620</td>
<td>0.7333</td>
<td>0.5937</td>
<td>0.4677</td>
<td>0.3303</td>
<td>0.2980</td>
<td>0.9339</td>
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<tr>
<td>M6</td>
<td>0.686</td>
<td>0.7096</td>
<td>0.7625</td>
<td>0.6545</td>
<td>0.9273</td>
<td>0.8873</td>
<td>0.4256</td>
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<tr>
<td>M7</td>
<td>0.516</td>
<td>0.7728</td>
<td>0.8066</td>
<td>0.6385</td>
<td>0.9360</td>
<td>0.8993</td>
<td>0.7371</td>
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<tr>
<td>M8</td>
<td>0.783</td>
<td>0.6966</td>
<td>0.7065</td>
<td>0.5823</td>
<td>0.9540</td>
<td>0.9251</td>
<td>0.5580</td>
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<tr>
<td>M9</td>
<td>0.787</td>
<td>0.6747</td>
<td>0.6036</td>
<td>0.4591</td>
<td>0.9546</td>
<td>0.9260</td>
<td>0.5812</td>
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<tr>
<td>M10</td>
<td>0.477</td>
<td>0.7879</td>
<td>0.3064</td>
<td>0.1731</td>
<td>0.9318</td>
<td>0.8935</td>
<td>0.2680</td>
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<tr>
<td>M11</td>
<td>4.658</td>
<td>0.0974</td>
<td>0.6928</td>
<td>0.5625</td>
<td>0.6416</td>
<td>0.5651</td>
<td>0.6302</td>
</tr>
<tr>
<td>M12</td>
<td>0.664</td>
<td>0.7716</td>
<td>0.8067</td>
<td>0.5132</td>
<td>0.9760</td>
<td>0.9546</td>
<td>0.6707</td>
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<tr>
<td>M13</td>
<td>0.423</td>
<td>0.8091</td>
<td>0.3541</td>
<td>0.1934</td>
<td>0.9585</td>
<td>0.9261</td>
<td>0.2625</td>
</tr>
<tr>
<td>M14</td>
<td>0.681</td>
<td>0.7116</td>
<td>0.5172</td>
<td>0.3437</td>
<td>0.9750</td>
<td>0.9529</td>
<td>0.4132</td>
</tr>
<tr>
<td>M15</td>
<td>0.479</td>
<td>0.7873</td>
<td>0.3212</td>
<td>0.1675</td>
<td>0.9626</td>
<td>0.9326</td>
<td>0.2688</td>
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<tr>
<td>M16</td>
<td>0.455</td>
<td>0.7965</td>
<td>0.3328</td>
<td>0.1585</td>
<td>0.9880</td>
<td>0.9729</td>
<td>0.3026</td>
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Table 3.8 Estimation Results of Double-log RGDP Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>Original Model 1</th>
<th>New Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable: log of real GDP</td>
<td></td>
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</tr>
<tr>
<td>Log of real total external debt stock</td>
<td>0.541 (0.055)</td>
<td>0.019 (0.040)</td>
<td>0.467*** (0.069)</td>
<td>-0.464 (0.534)</td>
<td>0.037** (0.076)</td>
<td>0.307** (0.070)</td>
<td>0.064 (0.398)</td>
<td>-0.421 (0.330)</td>
<td>0.088*** (0.078)</td>
<td>0.100 (0.390)</td>
<td>0.092 (0.390)</td>
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</tr>
<tr>
<td>Log of real long-term external debt stock</td>
<td>0.824* (0.446)</td>
<td>0.406** (0.096)</td>
<td>1.140*** (0.327)</td>
<td>-0.468 (0.334)</td>
<td>0.873*** (0.076)</td>
<td>0.707*** (0.070)</td>
<td>-0.421 (0.330)</td>
<td>0.088*** (0.078)</td>
<td>0.100 (0.390)</td>
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<tr>
<td>Log of log of real short-term external debt stock</td>
<td>-0.097* (0.049)</td>
<td>-0.085* (0.045)</td>
<td>0.167** (0.076)</td>
<td>-0.142*** (0.046)</td>
<td>-0.089** (0.053)</td>
<td>0.157*** (0.056)</td>
<td>0.003 (0.193)</td>
<td>-0.096 (0.072)</td>
<td>-0.098 (0.073)</td>
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<tr>
<td>Log of log of real total debt servicing as a percentage of exports</td>
<td>-0.124*** (0.064)</td>
<td>-0.104** (0.062)</td>
<td>0.061 (0.203)</td>
<td>-0.114 (0.088)</td>
<td>-0.105 (0.072)</td>
<td>0.013 (0.193)</td>
<td>-0.096 (0.072)</td>
<td>-0.098 (0.073)</td>
<td>-0.091 (0.064)</td>
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</tr>
<tr>
<td>Log of log of real workers’ remittances and compensation of employees received</td>
<td>0.167*** (0.049)</td>
<td>0.157** (0.041)</td>
<td>0.522*** (0.053)</td>
<td>-0.007 (0.053)</td>
<td>0.001 (0.053)</td>
<td>-0.006 (0.053)</td>
<td>0.001 (0.053)</td>
<td>-0.006 (0.053)</td>
<td>0.001 (0.053)</td>
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</tr>
<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>0.006 (0.029)</td>
<td>0.049* (0.024)</td>
<td>0.050 (0.070)</td>
<td>0.164** (0.072)</td>
<td>0.048* (0.024)</td>
<td>0.104** (0.027)</td>
<td>0.056 (0.024)</td>
<td>-0.013 (0.027)</td>
<td>-0.006 (0.025)</td>
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<tr>
<td>Log of money and quasi-money growth rate</td>
<td>-0.010 (0.031)</td>
<td>-0.005 (0.026)</td>
<td>-0.006 (0.024)</td>
<td>0.001 (0.025)</td>
<td>0.000 (0.025)</td>
<td>-0.013 (0.030)</td>
<td>0.008 (0.024)</td>
<td>-0.007 (0.025)</td>
<td>-0.006 (0.025)</td>
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<tr>
<td>Log of total labour force participation</td>
<td>1.549*** (1.027)</td>
<td>2.163*** (1.280)</td>
<td>2.102*** (1.004)</td>
<td>-4.024** (2.076)</td>
<td>-6.703** (2.799)</td>
<td>1.797** (1.015)</td>
<td>2.152*** (1.152)</td>
<td>-4.056 (2.774)</td>
<td>0.973 (1.180)</td>
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<tr>
<td>Log of real capital stock</td>
<td>1.925*** (0.293)</td>
<td>0.560 (0.398)</td>
<td>0.155 (0.324)</td>
<td>-1.199*** (0.857)</td>
<td>-2.508** (2.087)</td>
<td>0.449 (0.325)</td>
<td>0.754** (0.287)</td>
<td>0.292 (0.361)</td>
<td>-1.785** (0.635)</td>
<td>0.223 (0.360)</td>
<td>0.318 (0.363)</td>
<td>0.378 (0.342)</td>
<td>0.398 (0.342)</td>
<td>1.273 (0.198)</td>
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<tr>
<td>Adjusted R²</td>
<td>0.992</td>
<td>0.985</td>
<td>0.994</td>
<td>0.932</td>
<td>0.919</td>
<td>0.990</td>
<td>0.990</td>
<td>0.986</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90% significance.
Table 3.9 Results of Johansen Cointegration Rank Tests

<table>
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<tr>
<th>Null Hypothesis</th>
<th>Eigenvalue</th>
<th>Maximum Eigenvalue Statistic</th>
<th>5 Percent Critical Value</th>
<th>Probability</th>
<th>Trace Statistic</th>
<th>5 Percent Critical Value</th>
<th>Probability**</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0*</td>
<td>0.909630</td>
<td>62.50002</td>
<td>33.87687</td>
<td>0.0000</td>
<td>140.6880</td>
<td>69.81889</td>
<td>0.0000</td>
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<tr>
<td>r=1*</td>
<td>0.797707</td>
<td>41.54901</td>
<td>27.58434</td>
<td>0.0004</td>
<td>78.18797</td>
<td>47.85613</td>
<td>0.0000</td>
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<tr>
<td>r=2*</td>
<td>0.616720</td>
<td>24.93373</td>
<td>21.13162</td>
<td>0.0139</td>
<td>36.63896</td>
<td>29.79707</td>
<td>0.0070</td>
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<td>r=3</td>
<td>0.326613</td>
<td>10.28133</td>
<td>14.26460</td>
<td>0.1941</td>
<td>11.70522</td>
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<td>r=4</td>
<td>0.053293</td>
<td>1.423895</td>
<td>3.841466</td>
<td>0.2328</td>
<td>1.423895</td>
<td>3.841466</td>
<td>0.2328</td>
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</table>

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 3.10 Cointegrating Equations Based on the Normalized Cointegrating Coefficients

<table>
<thead>
<tr>
<th>Number of Co-integrating Equations</th>
<th>Log Likelihood</th>
<th>Dependent Variable of Interest</th>
<th>Real GDP growth rate</th>
<th>Growth rate of real total external debt stock</th>
<th>Growth rate of real long-term external debt stock</th>
<th>Growth rate of real short-term external debt stock</th>
<th>Growth rate of total debt servicing as a percent of exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>135.210</td>
<td>Real GDP growth rate</td>
<td>1.000</td>
<td>0.702 (0.467)</td>
<td>-1.333 (0.434)</td>
<td>0.018 (0.052)</td>
<td>-0.102 (0.059)</td>
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<tr>
<td>2</td>
<td>155.984</td>
<td>Real GDP growth rate</td>
<td>1.000</td>
<td>0.000 (0.052)</td>
<td>-0.575 (0.059)</td>
<td>-0.027 (0.039)</td>
<td>0.152 (0.061)</td>
</tr>
<tr>
<td>3</td>
<td>168.451</td>
<td>Real GDP growth rate</td>
<td>1.000</td>
<td>0.000 (0.059)</td>
<td>0.000 (0.059)</td>
<td>-0.239 (0.059)</td>
<td>-0.180 (0.147)</td>
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</tbody>
</table>
Chapter 4

Effects of external debt growth variables on the growth rates of the real GDP shares of agriculture, industry, and services for Pakistan

4.1 Introduction

In light of an empirical evidence of a substantial usage of external debt for financing investments in Pakistan’s agriculture, industry, and services sectors, this chapter extends the analysis in Chapter 3 by estimating the relationships between the growth rates of sectoral shares of real GDP and the four external debt growth variables to shed some light on structural changes that have occurred in the economy. More specifically, it inquires into the nature of short-run and long-run effects of four external debt growth variables on the growth rates of the real GDP shares of the agriculture, industry and services sectors of Pakistan’s economy during the era of external debt accumulation since 1981. This analysis may also provide lessons for Greece and other European Union countries facing similar problems.

This chapter is also motivated by the historical fact of simultaneous robust growth of all sectors of Pakistan’s economy in the 1960s, which implies that there exist possibilities of effects of external debt growth variables on the growth rates of the sectoral constituents of real GDP in the form of the real GDP shares of agricultural, industrial, and services sectors. While the existing literature on economic effects of

\footnote{Husain (1999), and Fasih-Uddin and Swati (2009).}
external debt for Pakistan does include empirical research on the real GDP growth effects of a couple of external debt growth variables, this chapter’s new empirical study of the effects of external debt growth variables on her sectoral real GDP shares’ growth rates is warranted by the absence of comprehensive empirical literature on these effects on the growth rates of the real GDP shares of agriculture, industry, and services.

Finally, the above empirical research will be useful to determine the existence of any similarity or difference between the short-run and long-run effects of the growth rates of Pakistan’s real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports of goods, services, and income on the growth rates of the real GDP shares of agriculture, industry, and services.

By using the unit root tests for nonstationarity, Ordinary Least Squares (OLS), OLS residual and stability diagnostics, and the Johansen’s multiple cointegration tests, this chapter presents an econometric analysis of the short-run and long-run effects of the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rate of the real GDP share of agriculture, on the growth rate of the real GDP share of industry, and on the growth rate of the real GDP share of services.

In addition, the OLS-based double-log regression models of dependent variables, in the form of sectoral real GDP shares and the explanatory external debt variables, are also estimated for determining the elasticities of the real GDP shares of agriculture,
industry, and services with respect to the explanatory external debt variables in order to find out about the elastic or inelastic nature of the real GDP shares of agriculture, industry, and services with respect to the explanatory external debt variables. Moreover, the tests for cointegration are carried out to determine whether the above dependent variables, and explanatory external debt growth variables, are cointegrated to explore the possibility of the existence of a long-run stable equilibrium relationship between the above dependent variables and the relevant explanatory external debt growth variables.

Section 4.2 presents the empirical econometric analysis of the short-run effects of four external debt growth variables on the growth rates of the real GDP shares of agriculture, industry, and services. Subsection 4.2.1 presents the sector-level estimation results of short-run models of the growth rates of the real GDP shares of agriculture, industry, and services using the three control variables (the growth rates of real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money). It also presents an analysis of the robustness of results of short-run econometric models to the inclusion of two additional control variables (the growth rate of total labour force and the first-differenced growth rate of real capital stock). In addition, it presents elasticities of the real GDP shares of agriculture, industry and services, which are estimated using double-log regression models of dependent variables in the form of sectoral real GDP shares by means of the OLS method. Subsection 4.2.2 presents an empirical analysis of the long-run effects of four external debt growth variables on the growth rates of
the real GDP shares of agriculture, industry, and services. Finally, Section 4.3 presents a summary, conclusions and policy recommendations.

4.2 Sector-level estimation results

This section presents the estimation results of the effects of Pakistan’s ever-growing external debt on the growth rates of the real GDP shares of agriculture, industry, and services using annual data obtained from the World Bank’s World Development Indicators and the aforementioned time series of real capital stock (calculated in Chapter 3) for the period 1981-2010.

All the sectoral real GDP share growth time series were tested for nonstationarity by using the Augmented Dickey-Fuller test statistics and the Phillips-Peron test statistics. The results of unit root tests for nonstationarity of all the sectoral real GDP share growth time series are presented in Table 4.1 in the appendix. On the basis of the Phillips-Peron test statistics, the first-differenced growth rate of real capital stock and all other relevant growth rate time series are confirmed to be stationary at the 99% confidence level. The stationarity of all the above growth time series implies the relevance of estimating short-run econometric models of the growth rates of the real GDP shares of agriculture, industry, and services.

Here, it is pertinent to note that the already applied criterion of selecting the right models having signs of the estimated coefficients of the explanatory variables

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2 The names, acronyms, and data sources of all the relevant variables have already been presented in Table 3.1 along with descriptive statistics presented in Table 3.2 in the appendix to the Chapter 3.
according to both theory and expectations is not applicable in the case of sectoral GDP share growth models due to the following facts:

i) There is lack consensus on both the external debt-growth rate relationship observed by Siddiqui and Malik (2001).

ii) The economic theory is unable to predict as well as explain the direction of change in the growth rates of the real GDP shares of agriculture, industry, and services since the sectoral real GDP share growth rates signify change in the sectoral-cum-structural composition of the national economy. The sectoral changes occur in such a way that some sectoral real GDP shares increase and other sectoral real GDP shares decrease. The sectoral changes can be either due to natural changes over time in the sectoral composition of the national economy or real GDP, or total external debt (in terms of long-term and short-term external debt), or because of the changing conditions and the fundamentals of national and global economies. This argument also applies to effects of certain external debt growth variables on the growth rates of real GDP shares of agriculture, industry, and the services during the business cycle associated with Pakistan’s external debt crisis in light of the following assertion of Ormerod and Campbell (1997, p. 88):

“The idea that the movements in GDP over the course of the business cycle are inherently unpredictable is not new in economics and some of the early quantitative thinking about the cycle, by for example Fisher (1925) and Slutsky (1937) in the 1920s and 1930, advanced this as a hypothesis. The use of spectrum analysis confirms the validity of the hypothesis.”
iii) Certain negative real GDP growth effects as well as sectoral real GDP share growth effects of the external debt growth variables are also consistent with the empirical finding of Iqbal (1994), that Pakistan’s real output growth decelerated due to the use of structural adjustment loans in nonproductive activities.

In light of the above facts, the sectoral real GDP growth effects of the explanatory external debt growth variables are expected to be either positive or negative and, therefore, it is pertinent to note that the right sectoral real GDP share growth models may have anyone of the expected positive and negative signs of the estimated coefficients of the explanatory variables.

4.2.1.1 Short-run effects of the external debt growth variables on the growth rate of the real GDP share of agriculture

To determine the short-run effects of external debt growth on the growth rate of real GDP share of agriculture, the OLS method was used to estimate sixteen agriculture’s real GDP share growth models including the independent variables, which have been found significant in explaining economic growth in the growth models, as discussed in the empirical literature. This approach sounds reasonable as the estimation of the sixteen agriculture’ real GDP share growth models makes it possible to present a comprehensive spectrum of all possible scenarios of the estimated effects of all explanatory external debt growth variables on the growth rate of the real GDP share of agriculture in the framework of various agriculture’s GDP share growth models. More specifically, the estimations of these growth models make it possible to identify
the individual effects of the explanatory external debt growth variables on the growth rate of the real GDP share of agriculture in the framework of the various growth models having either one, two, three, or all of the explanatory external debt growth variables, with or without the set of control variables. In other words, this econometric modelling approach of adding explanatory variables step-by-step in the econometric models helps detect any major changes in the magnitude and significance of the coefficients of the explanatory variables after the addition of an explanatory variable in an econometric model of the growth rate of the real GDP share of agriculture. Estimation results of the aforementioned sixteen of agriculture’s real GDP share growth models are presented in Table 4.2 in the appendix.

However, an econometric justification can be found for only 15 of the above 16 of agriculture’s real GDP share growth models, which simultaneously passed the tests associated with the OLS residual diagnostics\(^3\) and stability diagnostics\(^4\) at the 5% significance level in light of the empirical results of these diagnostics presented in Table 4.2.1 in the appendix to this chapter. Out of these 15 of agriculture’s real GDP share growth models, here it is pertinent to present only the empirical results of four important models (Models 1, 5, 6, and 13), on the basis of the selection criteria of the theoretical relevance-cum-plausibility of the models in terms of the usefulness of their explanatory variables determined by the underlying economic theory.

\(^3\) Jarque-Bera test for normality, Breusch-Godfrey Serial Correlation LM Test in the form of Probability of F-Statistic, Breusch-Pagan-Godfrey Test of Heteroskedasticity in the form of Probability of Chi-Square-Statistic, and Heteroskedasticity Test for Autoregressive Conditional Heteroskedastic (ARCH) Effects in the form of Probability of Chi-Square-Statistic.

\(^4\) Chow Breakpoint Test for the breakpoint date of 1998 — Pakistan’s nuclear tests of 28 May 1998 triggered the imposition of the Western powers’ economic sanctions against Pakistan which, in turn, triggered Pakistan’s external debt crisis in 1998 (Husain 1999, p. 419).
4.2.1.1.1 Econometric modelling and estimation results

A generic form of the aforementioned agriculture’s real GDP share growth models is presented below:

\[ \dot{Y}_t = \gamma_0 + \gamma_1 \dot{X}_t + \gamma_2 \dot{Z}_t + u_t \] (4.1)

In equation 4.1, \( \dot{Y}_t \) signifies the growth rate of the agriculture’s share of real GDP (\( Y_t \)), \( \dot{X}_t \) signifies the vector of the growth rates of explanatory variables (\( X_t \)), namely, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and \( \dot{Z}_t \) signifies a vector of the growth rates of controls (\( Z_t \)) namely real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money.

In agriculture’s Real GDP Share Growth Model 1, the growth rate of agriculture’s share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports. From the estimation results in Table 4.2, only the growth rate of real total external debt stock has a significant positive effect on the growth rate of agriculture’s share of real GDP, and the growth rate of real long-term external debt stock has a significant negative effect on the growth rate of agriculture’s share of real GDP.

In agriculture’s Real GDP Share Growth Model 5, the growth rate of agriculture’s share of real GDP is assumed to vary in response to changes in the growth rates of total debt servicing as a percentage of exports, real workers’ remittances and
compensation of employees received, real foreign direct investment net inflows, and
money and quasi money. From the estimation results in Table 4.2, none of the
explanatory variables has either a significant positive effect or a significant negative
effect on the growth rate of agriculture’s share of real GDP.

For agriculture’s Real GDP Share Growth Model 6, the growth rate of total debt
servicing as a percentage of exports is replaced by the growth rates of real total
external debt stock, and real long-term external debt stock (vis-a-vis agriculture’s
Real GDP Share Growth Model 5) and the equation is re-estimated. From the
estimation results in Table 4.2, only the growth rate of real total external debt stock
has a significant positive effect on the growth rate of agriculture’s share of real GDP.

For agriculture’s Real GDP Share Growth Model 13, the growth rates of real total
external debt stock and real long-term external debt stock are added (vis-a-vis
agriculture’s Real GDP Share Growth Model 5) and the equation is re-estimated.
From the estimation results in Table 4.2, none of the explanatory variables has either
a significant positive effect or a significant negative effect on the growth rate of
agriculture’s share of real GDP.

From the point of view of an empirical analysis of the effects of external debt
variables on agriculture’s share of real GDP, it is also important to consider the
relationship in the form of the partial degree of responsiveness (partial elasticity) of
agriculture’s share of real GDP to changes in its determinants, such as real total
external debt stock, real long-term external debt stock, real short-term external debt
stock, total debt servicing as a percentage of exports, and other pertinent control
variables, by means of estimating the double-log regression models of agriculture’s share of real GDP (Studenmund 2011, p. 213). Also Gujrati (2009) notes that the fit of a double-log model seems to be slightly better than the fit of the linear model. Of course, the use of the double-log models of agriculture’s share of real GDP is also justifiable on the basis of exploring the possibility of changes in the nature of significance of the determinants of agriculture’s share of real GDP. Thus, the effects of the above explanatory variables on the percentage change in agriculture’s share of real GDP rather than the growth rate of agriculture’s share of real GDP are analysed.

All the aforementioned variables’ log time series (logarithms of agriculture’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money growth rate) were tested for nonstationarity by using the Augmented Dickey-Fuller test statistics and the Phillips-Peron test statistics. Results of unit root tests for nonstationarity of all the log time series are presented in Table 4.3 in the appendix.

While replicating the construction pattern of the aforementioned 16 of agriculture’s real GDP share growth models, 16 double-log agriculture’s share of real GDP models are estimated by means of the OLS method using the pertinent stationary as well as nonstationary log time series. A generic form of the double-log agriculture’s share of real GDP models is presented below:

\[ \log Y_t = \delta_0 + \delta_1 \log X_t + \delta_2 \log Z_t + \varepsilon_t \] (4.2)
In equation 4.2, $Y_t$ signifies the agriculture’s share of real GDP, $X_t$ is a vector of explanatory variables including real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and $Z_t$ is a vector of controls including real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money growth rate.

Estimation results of the 16 double-log agriculture’s share of real GDP models are presented in Table 4.4 in the appendix. It is pertinent to note that all the estimated absolute values of elasticities of agriculture’s share of real GDP, with respect to its explanatory external debt variables and control variables, are less than one, thereby implying that agriculture’s share of real GDP is inelastic.

Now regression equation 4.1 is being re-estimated using the slightly modified approach of Cunningham (1993) to determine the robustness of the above estimation results to the addition of two more control variables, stationary time series of the growth rate of total labour force (instead of population growth rate) and the first-differenced growth rate of the real capital stock (instead of investment/GDP ratio), to the above vector of control variables $Z_t$.\(^5\) In this amended modelling framework, equation 4.1 is re-estimated and the estimation results of sixteen of agriculture’s real GDP share growth models are presented in Table 4.9 in the appendix. An econometric justification is found for all of agriculture’s real GDP share growth

\(^5\) Here, the modified approach of Cunningham (1993) is used partly because of the availability of the World Bank data for our preferred variables and partly because of the greater theoretical suitability of our selected explanatory variables for explaining the growth rates of both real GDP and its sectoral shares.
models, which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 5% significance level in light of the empirical results of these diagnostics presented in Table 4.9.1 in the appendix. However, here it is pertinent to only present the empirical results of one important agriculture’s Real GDP Share Growth Model (New Model1) of the 5 agriculture’s real GDP share growth models (Models 1, 7, 12, 14, and 16), on the basis of the aforementioned selection criteria.

In the new agriculture’s Real GDP Share Growth Model 1, the growth rate of agriculture’s share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, total labour force, and the first-differenced growth rate of real capital stock. From the estimation results in Table 4.9, only the growth rate of real total external debt stock has a significant positive effect on the growth rate of agriculture’s share of real GDP, and the growth rate of real long-term external debt stock has a significant negative effect on the growth rate of agriculture’s share of real GDP.

Overall, Tables 4.2 and 4.9 have documented the evidence of existence of the following effects:

i) Significant positive short-run effects of the growth rate of real total external debt stock on the growth rate of agriculture’s share of real GDP.

ii) Significant negative short-run effects of the growth rate of real long-term external debt stock on the growth rate of agriculture’s share of real GDP.
iii) Significant negative short-run effects of the growth rate of real foreign direct investment net inflows on the growth rate of agriculture’s share of real GDP.

A comparison of the estimation results of agriculture’s Real GDP Share Growth Model 1 (using no control variables) in Table 4.2 and New Agriculture’s Real GDP Share Growth Model 1 (using the growth rate of the total labour force and the first-differenced growth rate of real capital stock as two control variables) in Table 4.9 reflects the robustness of the following pieces of empirical evidence to the addition of the growth rate of the total labour force and the first-differenced growth rate of real capital stock as control variables:

i) The growth rate of real total external debt stock has a significant positive short-run effect on the growth rate of agriculture’s share of real GDP.

ii) The growth rate of real long-term external debt stock has a significant negative short-run effect on the growth rate of agriculture’s share of real GDP.

The above two pieces of empirical evidence authenticate this chapter’s first motivation by confirming the actual existence of the significant short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of agriculture. Moreover, the above empirical evidence not only signals the actual significant usage of the above external debt in the agricultural sector in irrigation projects (for example, construction of dams as mentioned earlier) thereby endorsing this chapter’s second motivation but also addresses this chapter’s third motivation by empirically showing that the short-run
effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GPP share of agriculture are dissimilar.

As for the earlier analysis of the agriculture sector, it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of agriculture’s share of real GDP to changes in its determinants, by means of estimating the double-log regression models of agriculture’s share of real GDP after adding two more control variables, that is, total labour force and the real capital stock, in the above vector of control variables $Z_t$ in equation 4.2. While replicating the construction pattern of the double-log models of agriculture’s real GDP share in equation 4.2, the 16 double-log agriculture’s share of real GDP models are re-estimated by means of the OLS method using the pertinent stationary as well as nonstationary log time series.

The estimation results of the 16 double-log agriculture’s share of real GDP models are presented in Table 4.10 in the appendix. It is pertinent to note that all the estimated elasticities of agriculture’s share of real GDP with respect to its explanatory external debt variables and control variables, other than total labour force, are less than one, thereby implying that agriculture’s share of real GDP is inelastic. However, there is empirical evidence of the estimated absolute values of elasticities of agriculture’s share of real GDP with respect to total labour force being either less than one, in the case of fourteen of the double-log agriculture’s share of real GDP models (Models 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16), thereby implying that agriculture’s share of real GDP is inelastic, or greater than one in the
case of two of the double-log agriculture’s share of real GDP models (Models 1 and 4), thereby implying that agriculture’s share of real GDP is elastic.

There is empirical evidence of the plausible significant positive short-run effect of the growth rate of real total external debt stock on the growth rate of agriculture’s share of real GDP, based on a comparison of Agriculture’s Real GDP Share Growth Model 1 in Table 4.2 and Agriculture’s Real GDP Share Growth Model 1 in Table 4.9.

### 4.2.1.2 Short-run econometric models of the growth rate of the real GDP share of industry

To determine the short-run effects of the aforementioned four external debt growth variables on the growth rate of the real GDP share of industry using the same reasoning as in Section 4.2.1.1, the OLS method was used to estimate sixteen of industry’s real GDP share growth models. The estimation results of these industry’s real GDP share growth models are presented in Table 4.5 in the appendix.

However, an econometric justification is found for only 15 of the above 16 of industry’s real GDP share growth models, which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 5% significance level in light of the empirical results of these diagnostics presented in Table 4.5.1 in the appendix. Out of these 15 of industry’s real GDP share growth models, here it is pertinent to only present the empirical results of five important industry’s real GDP share growth models (Models 2, 3, 4, 5, and 6), on the basis of the aforementioned selection criteria.
4.2.1.2.1 Econometric modelling and estimation results

A generic form of the aforementioned industry’s real GDP share growth models is presented below:

\[ \hat{y}_t = \Theta_0 + \Theta_1 \hat{x}_t + \Theta_2 \hat{z}_t + \nu_t \]  

(4.3)

In equation 4.3, \( \hat{y}_t \) signifies the growth rate of the industry’s share of real GDP (\( Y_t \)), \( \hat{x}_t \) signifies the vector of the growth rates of explanatory variables (\( X_t \)) namely real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and \( \hat{z}_t \) signifies a vector of the growth rates of controls (\( Z_t \)) namely real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money.

In industry’s Real GDP Share Growth Model 2, the growth rate of the industry’s share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 4.5, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of the industry’s share of real GDP.

For industry’s Real GDP Share Growth Model 3, the variable growth rate of real total external debt stock is replaced by growth rate of real long-term external debt stock (vis-a-vis Model 2) and the equation is re-estimated. From the estimation results in
Table 4.5, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of the industry’s share of real GDP.

For industry’s Real GDP Share Growth Model 4, the variable growth rate of real total external debt stock is replaced by growth rate of real short-term external debt stock (vis-a-vis Model 2) and the equation is re-estimated. From the estimation results in Table 4.5, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of the industry’s share of real GDP.

For industry’s Real GDP Share Growth Model 5, the variable growth rate of real total external debt stock is replaced by the growth rate of total debt servicing as a percentage of exports (vis-a-vis Model 2) and the equation is re-estimated. From the estimation results in Table 4.5, the growth rate of real workers’ remittances and compensation of employees has a significant negative effect on the growth rate of industry’s share of real GDP, and the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of industry’s share of real GDP.

In industry’s Real GDP Share Growth Model 6, the growth rate of industry’s share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 4.5, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of industry’s share of real GDP.
As for the analysis of the agriculture sector, here it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of industry’s share of real GDP to changes in its determinants, by means of estimating the double-log regression models of industry’s share of real GDP using the same format as in section 4.2.1.1.

A generic form of the double-log industry’s share of real GDP models is presented below:

\[
\ln Y_t = \Pi_0 + \Pi_1 \ln X_t + \Pi_2 \ln Z_t + \omega_t \tag{4.4}
\]

In equation 4.4, \(Y_t\) signifies the industry’s share of real GDP, \(X_t\) is a vector of explanatory variables including real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and \(Z_t\) is a vector of controls including real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money growth rate.

The estimation results of the 16 double-log industry’s share of real GDP models are presented in Table 4.6 in the appendix. It is pertinent to note that all the estimated absolute values of elasticities of industry’s share of real GDP with respect to its explanatory external debt variables and control variables are less than one, thereby implying that industry’s share of real GDP is inelastic.

By means of the same modified approach of Cunningham (1993) used in Section 4.2.1.1, now regression equation 4.3 is being re-estimated to determine the robustness of the above estimation results to the addition of two more control variables,
stationary time series of the growth rate of total labour force and the first-differenced growth rate of real capital stock, to the above vector of control variables $\tilde{Z}_t$. In this amended modelling framework, equation 4.3 is re-estimated and the estimation results of sixteen of industry’s real GDP share growth models are presented in Table 4.11 in the appendix. An econometric justification is found for only 10 of the above 16 of industry’s real GDP share growth models, which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 5% significance level in light of the empirical results of these diagnostics which are presented in Table 4.11.1 in the appendix. Out of these 10 industry’s real GDP share growth models, here it is pertinent to only present the empirical results of one important model, industry’s Real GDP Share Growth Models 2, on the basis of the aforementioned selection criteria.

In industry’s Real GDP Share Growth Model 2, the growth rate of the industry’s share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money, total labour force, and the first differenced growth rate of real capital stock. From the estimation results in Table 4.11, only the growth rate of real foreign direct investment net inflows has a significant positive effect on the growth rate of industry’s share of real GDP.

Table 4.11 has documented the evidence of the existence of the following effects:
i) Significant negative short-run effects of the growth rates of real total external debt stock on the growth rate of industry’s share of real GDP.

ii) Significant positive short-run effects of the growth rate of real long-term external debt stock on the growth rate of industry’s share of real GDP.

iii) Significant positive short-run effects of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP.

The above first two pieces of empirical evidence authenticate this chapter’s first motivation by confirming the actual existence of the significant short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of industry. Moreover, the above empirical evidence not only signals the actual significant usage of the above external debt in the industrial sector in infrastructural projects (for example, construction of roads as mentioned earlier) thereby endorsing this chapter’s second motivation but also addresses this chapter’s third motivation by empirically showing that the short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GPP share of industry are dissimilar.

Notably, a comparison of the estimation results of especially industry’s Real GDP Share Growth Model 2 in Table 4.5 and industry’s Real GDP Share Growth Model 2 in Table 4.11 reflects the robustness of the empirical evidence of a significant positive short-run effect of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP, to the addition of the growth rate of the total labour force and the first-differenced growth rate of real capital stock as control variables.
As for the earlier analysis of the industrial sector, it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of industry’s share of real GDP to changes in its determinants, by means of estimating the double-log regression models of industry’s share of real GDP after adding two more control variables, total labour force and real capital stock, in the above vector of control variables $Z_t$ in equation 4.4. While replicating the construction pattern of the double-log models of industry’s real GDP share in equation 4.4, the 16 double-log industry’s share of real GDP models are re-estimated by means of the OLS method using the pertinent stationary as well as nonstationary log time series.

The estimation results of the 16 double-log industry’s share of real GDP models are presented in Table 4.12 in the appendix. There is empirical evidence of the estimated absolute values of elasticities of industry’s share of real GDP with respect to all explanatory/control variables other than total labour force being less than one, thereby implying that industry’s share of real GDP is inelastic. There is also empirical evidence of the estimated absolute values of elasticities of industry’s share of real GDP with respect to total labour force being either less than one, in the case of the fifteen double-log industry’s share of real GDP models (Models 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16), thereby implying that industry share of real GDP is inelastic, or greater than one, in the case of one double-log industry’s share of real GDP model (Model 4), thereby implying that industry’s share of real GDP is elastic.

Comparison of the estimation results of especially industry’s Real GDP Share Growth Model 2 in Table 4.5 and industry’s Real GDP Share Growth Model 2 in Table 4.11 reflects the robustness of empirical evidence of a significant positive
short-run effect of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP.

4.2.1.3 Short-run econometric models of the growth rate of real GDP share of services

The analysis in the previous two sections is replicated for the growth rate of the real GDP share of services, and the estimation results of the sixteen of services’ real GDP share growth models are presented in Table 4.7 in the appendix.

An econometric justification is found for only 5 of the above 16 of services’ real GDP share growth models, which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 5% significance level in light of the empirical results of these diagnostics presented in Table 4.7.1 in the appendix. Here it is pertinent to present the empirical results of the 5 of services’ real GDP share growth models (Models 1, 7, 12, 14, and 16), on the basis of the aforementioned selection criteria.

4.2.1.3.1 Econometric modelling and estimation results

A generic form of the aforementioned services’ real GDP share growth models is presented below:

\[ \hat{y}_t = \Psi_1 \hat{x}_t + \Psi_2 \hat{z}_t + \phi_t \]  \hspace{1cm} (4.5)

In equation 4.5, \( \hat{y}_t \) signifies the growth rate of the services’ share of real GDP (\( \hat{y}_t \)), \( \hat{x}_t \) signifies the vector of the growth rates of explanatory variables (\( \hat{x}_t \)) including real total external debt stock, real long-term external debt stock, real short-term external
debt stock, and total debt servicing as a percentage of exports, and $Z_t$ signifies a vector of the growth rates of controls ($Z_t$) including real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money.

In services’ Real GDP Share Growth Model 1, the growth rate of the services’ share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports. From the estimation results in Table 4.7, none of the above four external debt growth variables as the explanatory variables has a significant positive effect or negative effect on the growth rate of the services’ share of real GDP.

In services’ Real GDP Share Growth Model 7, the growth rate of the services’ share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real short-term external debt stock, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 4.7, only the growth rate of real workers’ remittances and compensation of employees received has a significant positive effect on the growth rate of the services’ share of real GDP.

In services’ Real GDP Share Growth Model 12, the growth rate of the services’ share of real GDP is assumed to vary in response to changes in the growth rate of real total external debt stock, real long-term external debt stock, real short-term external debt stock, real workers’ remittances and compensation of employees received, real
foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 4.7, only the growth rate of real workers’ remittances and compensation of employees received has a significant positive effect on the growth rate of the services’ share of real GDP.

For services’ Real GDP Share Growth Model 14, the growth rate of real long-term external debt stock is replaced by the growth rate of total debt servicing as a percentage of exports (vis-a-vis Model 12) and the equation is re-estimated. From the estimation results in Table 4.7, only the growth rate of real workers’ remittances and compensation of employees received has a significant positive effect on the growth rate of the services’ share of real GDP.

In services’ Real GDP Share Growth Model 16, the growth rate of the services’ share of real GDP is assumed to vary in response to changes in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, and money and quasi money. From the estimation results in Table 4.7, only the growth rate of real workers’ remittances and compensation of employees received has a significant positive effect on the growth rate of the services’ share of real GDP.

Following the same format as in Section 4.2.1.1, it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of the services’ share of real GDP to changes in its determinants, by means of estimating the double-log regression models of the services share of real GDP.
While replicating the construction pattern of the aforementioned 16 services’ real GDP share growth models, the 16 double-log services’ share of real GDP models are estimated by means of the OLS method using the pertinent stationary as well as nonstationary log time series.

A generic form of the double-log services’ share of real GDP models is presented below:

\[ log \, Y_t = \rho_0 + \rho_1 \log X_t + \rho_2 \log Z_t + \tau_t \]  

(4.6)

In equation 4.6, \( Y_t \) signifies the services’ share of real GDP, \( X_t \) is a vector of explanatory variables including real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, and \( Z_t \) is a vector of controls including real foreign direct investment, real workers’ remittances and compensation of employees received, and money and quasi money growth rate.

The estimation results of the 16 double-log services’ share of real GDP models are presented in Table 4.8 in the appendix. It is pertinent to note that all the estimated absolute values of elasticities of services’ share of real GDP with respect to its explanatory external debt variables and control variables are less than one, thereby implying that the services’ share of real GDP is inelastic.

By means of the same modified approach of Cunningham (1993) used in previous two sections, here it is pertinent re-estimate regression equation 4.5 to determine the robustness of the above estimation results to the addition of two more control variables, stationary time series of the growth rate of the total labour force and the
first-differenced growth rate of real capital stock, to the above vector of control variables $\hat{Z}_t$. In this amended modelling framework, equation 4.5 is re-estimated and the estimation results of the sixteen of the services’ real GDP share growth models are presented in Table 4.13 in the appendix. An econometric justification is found for only 1 of the above 16 of the services’ real GDP share growth models (New Services’ Real GDP Share Growth Model 1), which simultaneously passed the tests associated with the aforementioned OLS residual and stability diagnostics at the 5% significance level in light of the empirical results of these diagnostics which are presented in Table 4.13.1 in the appendix. Therefore, here it is pertinent to only present the estimation results of the New Services’ Real GDP Share Growth Model 1, on the basis of the aforementioned selection criteria.

In New services’ Real GDP Share Growth Model 1, the growth rate of the services’ share of real GDP is assumed to vary in response to changes in the growth rate of real total external debt stock, real long-term external debt stock, real short-term external debt stock, total debt servicing as a percentage of exports and total labour force, and the first differenced growth rate of real capital stock. From the estimation results in Table 4.13, none of the above four external debt growth variables as the explanatory variables has a significant short-run effect on the growth rate of the services’ share of real GDP.

Table 4.7 has documented the evidence of the existence of a significant positive short-run effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP. Notably, a comparison of the estimation results of especially services’ Real GDP Share Growth
Model 1 in Table 4.7 and New Services’ Real GDP Share Growth Model 1 in Table 4.13 reflects their robustness to the addition of the growth rate of the total labour force and the first-differenced growth rate of real capital stock as control variables.

As for the earlier analysis of the services, it is pertinent to consider the relationship in the form of the partial degree of responsiveness (partial elasticity) of services’ share of real GDP to changes in its determinants, by means of estimating the double-log regression models of the services’ share of real GDP after adding two more control variables, total labour force and real capital stock, in the above vector of control variables $Z_t$ in equation 4.6. While replicating the construction pattern of the double-log models of the services’ real GDP share in equation 4.6, the 16 double-log services’ share of real GDP models are re-estimated and the estimation results are presented in Table 4.14 in the appendix. It is pertinent to note that all the estimated absolute values of elasticities of the services’ share of real GDP with respect to its explanatory external debt variables and control variables are less than one, thereby implying that the services’ share of real GDP is inelastic.

A comparison of the estimation results of especially services’ Real GDP Share Growth Models 1, 7, 12, 14, and 16 in Table 4.7 reflects the robustness of empirical evidence of a significant positive short-run effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP.
4.2.2 Long-run effects of the external debt growth variables on sectoral real GDP share growth rates

While all the above growth variables and the first-differenced growth rate of real capital stock are stationary, not all their corresponding original variables (logarithms of agriculture’s share of real GDP, industry’s share of real GDP, the services’ share of real GDP, real total external debt stock, real long-term external debt stock, total debt servicing as a percentage of exports, real workers’ remittances and compensation of employees received, foreign direct investment net inflows, and total labour force) are stationary on the basis of the Phillips-Peron tests of nonstationarity at the 99% confidence level. Therefore, there arises a technical justification for testing the existence of cointegration among the relevant sets of growth variables and, thereby, determining the long-run agriculture’s real GDP share growth effects of the above four external debt growth variables, the long-run industry’s real GDP share growth effects of the external debt growth variables, and the long-run services’ real GDP share growth effects of the external debt growth variables via the Johansen cointegration test. The Johansen cointegration test, employing a pertinent set of the above growth variables and the first-differenced growth rate of real capital stock, is used to test the null hypothesis of no cointegrating vector for determining whether there exists the possibility of the presence of a long-run stable equilibrium relationship among them.
4.2.2.1 Long-run agriculture’s real GDP share growth effects of the external debt growth variables

The results of the Johansen’s multiple cointegration test, presented in Tables 4.15 and 4.16 in the appendix, are based on the use of the five control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money and total labour force, and the first-differenced growth rate of the real capital stock). These results in Table 4.15 confirm the presence of cointegration, implying the existence of a long-run stable equilibrium relationship between the growth rates of agriculture’s share of real GDP and the aforementioned external debt growth variables.

In Table 4.15 in the appendix, the maximum-eigenvalue test indicates the existence of three cointegrating equations at the 0.05 significance level and the trace test indicates the existence of four cointegrating equations at the 0.05 significance level. These tests confirm the existence of a long-run relationship among the growth variables, namely, the growth rates of the real GDP share of agriculture, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports. Here it is pertinent to note that the maximum-eigenvalue test is considered to be a more reliable test in the case of the small samples by Adebisi and Adeyemi (2008).

For ensuring a clearer interpretation, especially of the long-run agriculture’s real GDP share growth effects of the four external debt growth variables, cointegrating
vectors are normalized with respect to the growth rate of agriculture’s share of real GDP, and presented in Table 4.16 in the appendix.

On the basis of the aforementioned point of view that the maximum-eigenvalue test is considered to be a more reliable test in the case of small samples, here it is pertinent to interpret the normalized cointegrating coefficients in the cases of only one cointegrating equation, two cointegrating equations, and three cointegrating equations, as presented in Table 4.16, because they include the empirical evidence of the presence of certain significant long-run agriculture’s real GDP share growth effects (Adebiyi and Adeyemi, 2008).

In the case of one cointegration equation, which has associated with it a log-likelihood value of 144.945, only the growth rate of real short-term external debt stock has a significant negative long-run effect on the growth rate of real GDP share of agriculture at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase in the growth rates of real short-term external debt stock culminated in a decrease in the growth rate of real GDP share of agriculture, amounting to 0.072 units.

In the case of two cointegration equations, which have associated with them a log-likelihood value of 166.207, only the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports, respectively, have significant negative and positive long-run effects on the growth rate of the real GDP share of agriculture at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase
in the growth rate of real short-term external debt stock culminated in a decrease in 
the growth rate of the real GDP share of agriculture, amounting to 0.712 units; and 
that a unit individual increase in the growth rate of total debt servicing as a 
percentage of exports culminated in an increase in the growth rate of the real GDP 
share of agriculture, amounting to 3.192 units.

In the case of three cointegration equations, which have associated with them a log-
likelihood value of 178.124, only the growth rates of real short-term external debt 
stock and total debt servicing as a percentage of exports, respectively, have 
significant positive and negative long-run effects on the growth rate of the real GDP 
share of agriculture at the 5% significance level for the period 1981-2010. More 
specifically, the above cointegration equation implies that a unit individual increase 
in the growth rate of real short-term external debt stock culminated in an increase in 
the growth rate of the real GDP share of agriculture, amounting to 0.413 units; and 
that a unit individual increase in the growth rate of total debt servicing as a 
percentage of exports culminated in a decrease in the growth rate of the real GDP 
share of agriculture, amounting to 2.303 units.

The above empirical evidence authenticates this chapter’s first motivation by 
confirming the actual existence of only the significant long-run effects of the growth 
rates of real short-term external debt stock and total debt servicing as a percentage of 
exports on the growth rate of the real GDP share of agriculture. Moreover, the above 
empirical evidence not only signals the actual significant usage of the short-term 
external debt in the agricultural sector thereby endorsing this chapter’s second 
motivation but also addresses this chapter’s third motivation by empirically showing
that the long-run effects of the growth rates of real short-term external debt stock and
total debt servicing as a percentage of exports on the growth rate of the real GDP
share of agriculture are mixed.

4.2.3.2 Long-run industry’s real GDP share growth effects of the external debt
growth variables

The results of the Johansen’s multiple cointegration test, presented in Tables 4.17 and
4.18 in the appendix, are based on the use of the five control variables (the growth
rates of real workers’ remittances and compensation of employees received, real
foreign direct investment net inflows, money and quasi money and total labour force,
and the first-differenced growth rate of the real capital stock). These results confirm
the presence of cointegration, implying the existence of a long-run stable equilibrium
relationship between the growth rates of industry’s share of real GDP and the
aforementioned external debt growth variables. In Table 4.17 in the appendix, both
the maximum-eigenvalue test and the trace test indicate the existence of four
cointegrating equations at the 0.05 significance level. These tests confirm the
existence of long-run relationships between the growth variables, namely, the growth
rates of the real GDP share of industry, real total external debt stock, real long-term
external debt stock, real short-term external debt stock, and total debt servicing as a
percentage of exports.

For ensuring a clearer interpretation, especially of the long-run industry’s real GDP
share growth effects of the four external debt growth variables, cointegrating vectors
are normalized with respect to the growth rate of industry’s share of real GDP, and presented in Table 4.18 in the appendix.

However, here it is pertinent to interpret the normalized cointegrating coefficients in the cases of only one cointegrating equation, two cointegrating equations, and three cointegrating equations, as presented in Table 4.18, because they include the empirical evidence of the presence of certain significant long-run industry’s real GDP share growth effects.

In the case of one cointegration equation, which has associated with it a log-likelihood value of 145.448, only the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports, respectively, have significant positive and negative long-run effects on the growth rate of the real GDP share of industry at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of real short-term external debt stock culminated in an increase in the growth rate of the real GDP share of industry, amounting to 0.054 units; and that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in a decrease in the growth rate of the real GDP share of industry, amounting to 0.148 units.

In the case of two cointegration equations, which have associated with them a log-likelihood value of 166.150, only the growth rates of real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports, respectively, have significant negative, positive, and negative long-run
effects on the growth rate of the real GDP share of industry at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of real long-term external debt stock culminated in a decrease in the growth rate of the real GDP share of industry, amounting to 0.378 units; that a unit individual increase in the growth rate of real short-term external debt stock culminated in an increase in the growth rate of the real GDP share of industry, amounting to 0.177; and that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in a decrease in the growth rate of the real GDP share of industry, amounting to 0.240 units.

In the case of three cointegration equations, which have associated with them a log-likelihood value of 177.774, only the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports, respectively, have significant positive and negative long-run effects on the growth rate of the real GDP share of industry at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of real short-term external debt stock culminated in an increase in the growth rate of the real GDP share of industry, amounting to 0.046 units; and that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in a decrease in the growth rate of the real GDP share of industry, amounting to 0.295 units.

The above empirical evidence authenticates this chapter’s first motivation by confirming the actual existence of only the significant long-run effects of the growth
rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry. The above empirical evidence also authenticates this chapter’s first motivation by confirming the actual existence of a significant long-run effects of the growth rates of real long-term external debt stock, in addition to the already reported empirical evidence of a significant short-run positive effect of the growth rates of real long-term external debt stock on the growth rate of the real GDP share of industry. Moreover, the above empirical evidence signals the actual significant usage of both the long-term and the short-term external debt in the industrial sector thereby endorsing this chapter’s second motivation. In addition, the above empirical evidence also addresses this chapter’s third motivation by empirically showing that the short-run and the long-run effects of the growth rates of real long-term external debt stock are dissimilar, that the long-run effects of the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry are similar, and that the long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry are dissimilar.

4.2.3.3 Long-run services’ real GDP share growth effects of the external debt growth variables

The results of the Johansen’s multiple cointegration test, presented in Tables 4.19 and Table 4.20 in the appendix, are based on the use of the five control variables (the growth rates of real workers’ remittances and compensation of employees received, real foreign direct investment net inflows, money and quasi money, total labour
force, and the first-differenced growth rate of the real capital stock). These results in Table 4.19 confirm the presence of cointegration, implying the existence of a long-run stable equilibrium relationship between the growth rates of the services’ share of real GDP and the aforementioned external debt growth variables.

In Table 4.19 in the appendix, both the maximum-eigenvalue test and the trace test indicate the existence of two cointegrating equations at the 0.05 significance level. These tests confirm the existence of a long-run relationship among the growth variables, namely, the growth rates of the services’ share of Real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports.

For ensuring a clearer interpretation, especially of the long-run services’ real GDP share growth effects of the four external debt growth variables, the cointegrating vectors are normalized with respect to the growth rate of the services’ real GDP share, and presented in Table 4.20 in the appendix.

Here it is pertinent to interpret the normalized cointegrating coefficients in the cases of only one cointegrating equation, and two cointegrating equations, as presented in Table 4.20, which include the empirical evidence of the presence of certain significant long-run services’ real GDP share growth effects.

In the case of one cointegration equation, which has associated with it a log-likelihood value of 167.5154, only the growth rate of total debt servicing as a percentage of exports has a significant positive long-run effect on the growth rate of the real GDP share of services at the 5% significance level for the period 1981-2010.
More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in an increase in the growth rate of the real GDP share of services, amounting to 0.036 units.

In the case of two cointegration equations, which have associated with them a log-likelihood value of 188.878, only the growth rates of real long-term external debt stock, real short-term external debt stock and total debt servicing as a percentage of exports, respectively, have significant negative, positive, and positive long-run effects on the growth rate of the real GDP share of services at the 5% significance level for the period 1981-2010. More specifically, the above cointegration equation implies that a unit individual increase in the growth rate of real long-term external debt stock culminated in a decrease in the growth rate of the real GDP share of services amounting to 0.047 units; that a unit individual increase in the growth rate of real short-term external debt stock culminated in an increase in the growth rate of the real GDP share of services, amounting to 0.019 units; and that a unit individual increase in the growth rate of total debt servicing as a percentage of exports culminated in an increase in the growth rate of the real GDP share of services, amounting to 0.051 units.

The above empirical evidence authenticates this chapter’s first motivation by confirming the actual existence of only the significant long-run effects of the growth rates of real long-term external debt stock, real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of the services. The above empirical evidence signals the actual significant
usage of both the long-term and the short-term external debt in the services thereby endorsing this chapter’s second motivation. Moreover, the above empirical evidence also addresses this chapter’s third motivation by empirically showing that the long-run effects of the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of the services are dissimilar, and that the long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of the services are similar.

The above empirical analysis of long-run effects establishes the empirical fact that there exists empirical evidence of the presence of cointegration among the above relevant growth variables, implying the existence of a long-run stable equilibrium relationship among them.

The above empirical econometric analysis has generally confirmed certain important historical facts, which were highlighted in the already presented brief history of Pakistan’s economy, about the actual significant negative macroeconomic growth effects of the debt servicing burden in the form of external debt overhang and significant positive macroeconomic growth effects of external debt, FDI, and remittances sent by overseas Pakistani workers. For example, there is empirical evidence of a significant negative long-run effect of the growth rate of total debt servicing as a percentage of exports on the growth rate of real GDP share of the industrial sector and there is at least partial empirical evidence of a significant negative long-run effect of the growth rate of total debt servicing as a percentage of exports on the growth rate of real GDP share of the agricultural sector. Similarly,
there is empirical evidence of a significant positive short-run effect of the growth rates of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP and there is evidence of a significant short-run positive effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP. In addition, there is empirical evidence of a significant positive effect of the growth rate of external debt (in the form of either real total external debt stock or real long term external debt stock or real long term external debt stock) on the growth rates of the real GDP shares of agriculture, industry, and the services.

4.3 Conclusions and policy recommendations

The present analysis of the effects of the above external debt growth variables on the growth rates of the real GDP shares of agriculture/industry/services, being a new empirical study in the area of macroeconomic effects of external debt in Pakistan, has extended the literature on the growth effects of Pakistan’s external debt. Therefore, in contrast to the previous chapter, no reference is made to the previous studies in this chapter. The unit root tests of the pertinent times series of all the aforementioned growth variables confirmed the stationarity of the pertinent time series.

There is empirical evidence of the robust significant positive short-run effects of the growth rate of real total external debt stock on the growth rate of agriculture’s share of real GDP in the cases of both three and five control variables. This evidence is consistent with the already reported empirical evidence of positive short-run real GDP growth effect of the growth rate of real total external debt stock. This empirical
evidence leads to a short-run policy recommendation of accelerating the growth rate of
ergrowth of agriculture by promoting not only an equitable-cum-efficient allocation of real
total external debt stock external stock between the majority of the needy small
agricultural farm owners and a minority of resourceful large farm owners but also the
actual investment of the real total external debt stock by its beneficiaries. In addition,
it is recommended for the Government of Pakistan to ensure the equitable access to
credit of all economic agents for eliminating their liquidity constraints and, thereby,
breaking the exploitative vicious circle of interlocking factor markets prevalent
within the agriculture sector of Pakistan by simultaneously launching an official
program of effective credit reforms (Todaro and Smith, 2009). This policy
recommendation echoes as well as reinforces the earlier short-run policy
recommendation of accelerating real GDP growth by ensuring the most judicious,
strictly merit-based, equitable, transparent, and efficient allocation as well as
investment of the requisite real total external debt stock only and only in the highly
prioritized development projects of all sectors (agriculture, industry, and the
services), provinces, and regions of the Pakistan’ economy for achieving the
desirable patterns of sustainable balanced growth.

There is also empirical evidence of the robust significant negative short-run effects of
the growth rate of real long-term external debt stock on the growth rate of
agriculture’s share of real GDP in the cases of both three and five control variables.
This empirical evidence, which is inconsistent with the already reported empirical
evidence of positive short-run real GDP growth effect of the growth rate of real long-
term external debt stock, leads to the policy recommendation of ensuring sufficient
improvement in the degree of efficiency of investment of real long-term external debt stock for reinforcing the growth in the real GDP share of agriculture. This policy recommendation echoes the spirit of the above policy recommendation made in the context of the real total external debt stock.

In contrast to no empirical evidence of any significant short-run effects of both the growth rates of real short-term debt stock and total debt servicing as a percentage of exports on the growth rate of agriculture’s share of real GDP in both cases of three and five control variables in the selected pertinent agriculture’s share of real GDP growth models, there is mixed empirical evidence of both the significant negative and positive long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of agriculture’s share of real GDP. In the selected pertinent four and one short-run agriculture’s share of real GDP growth models, respectively, in Tables 4.2 and 4.9, there is no evidence of any significant short-run effects of five control variables on the growth rate of agriculture’s share of real GDP.

There is also empirical evidence of a significant positive short-run effect of the growth rate of real long-term external debt stock on the growth rate of industry’s share of real GDP in the case of five control variables. This empirical evidence, which is consistent with a positive effect of the growth rate of real long-term external debt stock on the growth rate of real GDP, leads to a short-run policy recommendation of accelerating the growth rate of industry by ensuring additional efficient investment of the real long-term external debt stock in the industrial projects of the Government of Pakistan as well as in the requisite industrial infrastructure (for
example, modern means of communication, rapid transportation, and efficient power
generation and transmission system). This policy recommendation is also compatible
with an earlier policy recommendation about the reinforcement of the positive role of
the growth rate of real long-term external debt stock in accelerating the growth rate
of real GDP.

In contrast to no evidence of any significant positive or negative short-run effects of
the growth rate of real short-term external debt stock on the growth rate of industry’s
share of real GDP in the cases of both three and five control variables in the selected
models, there is empirical evidence of a significant positive long-run effect of the
growth rate of real short-term external debt stock on the growth rate of industry’s
share of real GDP. This empirical evidence, in contrast to the mixed empirical
evidence of significant positive and negative effects of the growth rate of rate of real
short-term external debt on the growth rate of real GDP share of agriculture, leads to
the long-run policy recommendation of accelerating the growth rate of the industry
by promoting the most efficient-cum-economical investment of real short-term debt
in both the industrial infrastructure and the industrial projects of the Government of
Pakistan.

In contrast to no evidence of any significant positive or negative short-run effects of
the growth rate of total debt servicing as a percentage of exports on the rate of growth
of industry’s share of real GDP in the selected pertinent five and one short-run
industry’s share of real GDP growth models, respectively, in Tables 4.5 and 4.11,
there is evidence of a significant negative long-run effect of the growth rate of total
debt servicing as a percentage of exports on the rate of growth of industry’s share of
real GDP. This empirical evidence, which is consistent with a negative short-run and long-run effect of the growth rate of total debt servicing as a percentage of exports on the growth rate of real GDP, leads to a long-run policy recommendation of accelerating the growth rate of industry by both radically reducing the external debt stock through comprehensive macroeconomic reforms for minimizing the external debt burden and significantly increasing inflows of FDI in the industrial sector. This policy recommendation is compatible with a similar earlier policy recommendation, which was presented as a solution to the problem of external debt overhang in Chapter 3.

Out of five control variables, there is evidence of only significant short-run positive effects of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP in Table 4.11. This empirical evidence leads to a policy recommendation of accelerating the growth rate of real foreign direct investment net inflows for ensuring growth in real GDP share of industry in Pakistan from the point of view of accelerating the pace of economic development-oriented structural change in Pakistan. This policy recommendation is compatible with a similar earlier policy recommendation for accelerating the growth rate of real GDP.

In contrast to no evidence of significant short-run effects of the four external debt growth variables on the growth rate of the services’ share of real GDP in the selected pertinent five and one short-run services’ share of real GDP growth models, respectively, in Tables 4.7 and 4.13, there is evidence of a significant negative long-run effect of the growth rate of real long-term external debt and significant positive long-run effects of both the growth rates of real short-term external debt and total
debt servicing as a percentage of exports on the rate of growth of the services’ share of real GDP. The empirical evidence of a significant positive long-run effect of the growth rate of real short-term external debt, which is consistent with the significant positive effect of the growth rate of rate of real short-term external debt on the growth rate of industry and partially inconsistent with the mixed empirical evidence of both the significant negative and positive long-run effects of the growth rates of real short-term external debt stock on the growth rate of agriculture’s share of real GDP, leads to the long-run policy recommendation of accelerating the growth rate of the services by promoting the most efficient-cum-economical investment of real short-term debt in both the infrastructure of the services sector and the services’ projects of the Government of Pakistan.

However, there is evidence of a significant short-run positive effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP but only in the cases of the selected models in Table 4.7. This empirical evidence leads to a policy recommendation of accelerating the growth rate of real workers’ remittances and compensation of employees received for ensuring growth in real GDP share of the services in Pakistan from the point of view of accelerating the pace of economic development-oriented structural change in Pakistan. This policy recommendation is also compatible with a similar earlier policy recommendation for accelerating the growth rate of real GDP.

The empirical evidence authenticated this chapter’s first motivation by confirming the following facts:
a) There is empirical evidence of the significant short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of agriculture.

b) There is empirical evidence of the significant short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of industry.

c) There is empirical evidence of only the significant long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of agriculture.

d) There is empirical evidence of the actual existence of only the significant long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry.

e) There is empirical evidence of a significant long-run effect of the growth rates of real long-term external debt stock, in addition to the already reported empirical evidence of a significant short-run positive effect of the growth rates of real long-term external debt stock, on the growth rate of the real GDP share of industry.

f) There is empirical evidence of only the significant long-run effects of the growth rates of real long-term external debt stock, real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GPP share of the services.
Moreover, the empirical evidence signalled the actual significant usage of the external debt in the agriculture, industry and the services thereby endorsing this chapter’s second motivation. The following reported empirical facts addressed this chapter’s third motivation:

a) The short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of agriculture are dissimilar.

b) The short-run effects of the growth rates of real total external debt and real long-term external debt stock on the growth rate of the real GDP share of industry are dissimilar.

c) The long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of agriculture are mixed.

d) The short-run and the long-run effects of the growth rates of real long-term external debt stock are dissimilar.

e) The long-run effects of the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry are similar.

f) The long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of industry are dissimilar.
g) The long-run effects of the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of the services are dissimilar.

h) The long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of the real GDP share of the services are similar.

The empirical econometric analysis of the determinants of the growth rates of the real GDP shares of agriculture, industry, and the services has generally confirmed certain Pakistan-specific historical facts about the actual significant negative effects of the debt servicing burden in the form of external debt overhang in industry in particular and significant positive effect of external debt (in the form of either real total external debt stock or real long-term external debt stock or real short-term external debt stock) on the growth rates of the real shares of agriculture, industry, and the services. Moreover, there was empirical evidence of a significant positive short-run effect of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP and there was evidence of a significant short-run positive effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP.

The strength of this empirical study is attributable to the use of World Development Indicators 2012 of the World Bank as its data source, and the use of a comprehensive set of the pertinent four distinct external debt time series as the main explanatory variables, along with a comprehensive set of control variables for separately
determining their short and long-run effects on the growth rates of real GDP shares of the agriculture, industry, and services sectors of Pakistan over the past thirty years (1981-2010).

Keeping in view the facts that the growth rates of agriculture, industry, and the services are not only complementary to one another but also have a direct positive relationship with the growth rate of real GDP, generally the above sector-level policy recommendations are not only mutually compatible and capable of realizing synergy among agriculture, industry, and the services, but are also complementary to the earlier policy recommendations, which aim at accelerating the growth rate real GDP by means of accelerating different types of the requisite inflows of foreign capital.

One limitation of this empirical study is the small dataset covering the period 1981-2010 — a practical manifestation of a “small samples problem” which is usually encountered in applied macroeconomics because macroeconomic variables, such as budget deficits, are generally measured on yearly basis (Brooks, 2008, p. 2). Therefore, there is scope for overcoming the aforementioned limitation and, thereby, improving the estimation results of the above sectoral real GDP share growth models, by replicating the above empirical study in the future using a larger data set and covering a longer time period than the above 30-year period.

Another limitation of this empirical study may be the existence of a small number of the significant effects of the four external debt growth variables on the growth rates of the real GDP shares of the agriculture, industry, and services sectors of Pakistan. This is mainly due to the absence of sufficient over-time variations in the above
annual sectoral GDP share growth time series against the background of a stagnating developing country-specific characteristic of a very slow pace of annual change in the sectoral composition of the economy. The following graphs illustrate Pakistan’s GDP shares of agriculture, industry, and services (measured along the vertical axis, and with years shown along the horizontal axis), respectively, in Figures 4.1, 4.2, and 4.3:

Figure 4.1

GDP Share of Agriculture


Figure 4.2

GDP Share of Industry

In light of the aforementioned facts, there is scope for improving the estimation results of the three sets of the above sectoral real GDP share growth models by replicating the above empirical study with a larger data set covering a sufficiently longer time period than the above 30-year period, and by using three-year averages of time series in the future.

Table 4.1 Results of Unit Root Tests of Stationarity of Variables in Levels

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF Test Statistic</th>
<th>PP Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of agriculture’s share of real GDP</td>
<td>-5.102***</td>
<td>-5.102***</td>
</tr>
<tr>
<td>Growth rate of industry’s share of real GDP</td>
<td>-5.663***</td>
<td>-5.663***</td>
</tr>
<tr>
<td>Growth rate of services’ share of real GDP</td>
<td>-3.849***</td>
<td>-4.819***</td>
</tr>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>-7.367***</td>
<td>-11.409***</td>
</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>-7.361***</td>
<td>-10.214***</td>
</tr>
<tr>
<td>Growth rate of real short-term external debt stock</td>
<td>-6.671***</td>
<td>-7.583***</td>
</tr>
<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-6.881***</td>
<td>-6.860***</td>
</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>-6.086***</td>
<td>-6.371***</td>
</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>-6.633***</td>
<td>-7.656***</td>
</tr>
<tr>
<td>Money and quasi money growth rate</td>
<td>-4.218***</td>
<td>-4.406***</td>
</tr>
<tr>
<td>Growth rate of the total labour force</td>
<td>-4.920***</td>
<td>-4.920***</td>
</tr>
<tr>
<td>Growth rate of real capital stock</td>
<td>-0.477</td>
<td>-1.143</td>
</tr>
<tr>
<td>The first-differenced growth rate of real capital stock</td>
<td>-1.473</td>
<td>-7.963***</td>
</tr>
</tbody>
</table>

Notes: ADF stands for Augmented Dickey-Fuller; PP stands for Phillips-Peron. ***99%, **95%, and *90%
Table 4.2 Estimation Results of Short-Run Models of Growth in Agriculture’s Share of Real GDP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>0.542* (0.270)</td>
<td>0.021 (0.044)</td>
<td>0.420* (0.259)</td>
<td>0.006 (0.077)</td>
<td>0.020 (0.044)</td>
<td>0.500 (0.301)</td>
<td>0.400 (0.239)</td>
<td>0.004 (0.056)</td>
<td>0.468 (0.302)</td>
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</tr>
<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>-0.517* (0.252)</td>
<td>0.007 (0.044)</td>
<td>-0.401 (0.236)</td>
<td>0.014 (0.033)</td>
<td>0.019 (0.031)</td>
<td>-0.017 (0.037)</td>
<td>0.015 (0.033)</td>
<td>0.020 (0.031)</td>
<td>-0.014 (0.037)</td>
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</tr>
<tr>
<td>Growth rate of real-short term external debt stock</td>
<td>-0.027 (0.032)</td>
<td>0.016 (0.026)</td>
<td>0.019 (0.031)</td>
<td>0.016 (0.026)</td>
<td>0.016 (0.037)</td>
<td>0.015 (0.033)</td>
<td>0.015 (0.033)</td>
<td>0.015 (0.033)</td>
<td>-0.000 (0.036)</td>
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<tr>
<td>Growth rate of total debt servicing as a percent of exports</td>
<td>0.046* (0.034)</td>
<td>0.045 (0.037)</td>
<td>0.045 (0.038)</td>
<td>0.045 (0.038)</td>
<td>0.045 (0.037)</td>
<td>0.038 (0.036)</td>
<td>0.043 (0.038)</td>
<td>0.043 (0.038)</td>
<td>0.037 (0.037)</td>
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</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>-0.008 (0.036)</td>
<td>0.017 (0.035)</td>
<td>0.012 (0.025)</td>
<td>0.018 (0.019)</td>
<td>0.004 (0.017)</td>
<td>0.009 (0.017)</td>
<td>0.005 (0.016)</td>
<td>0.017 (0.017)</td>
<td>0.015 (0.016)</td>
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</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>-0.034* (0.018)</td>
<td>-0.036* (0.018)</td>
<td>-0.025 (0.017)</td>
<td>-0.025 (0.017)</td>
<td>-0.028 (0.019)</td>
<td>-0.036* (0.017)</td>
<td>-0.028 (0.019)</td>
<td>-0.027 (0.018)</td>
<td>-0.019 (0.018)</td>
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</tr>
<tr>
<td>Money and quasi money growth rate</td>
<td>0.028 (0.146)</td>
<td>0.024 (0.147)</td>
<td>0.019 (0.146)</td>
<td>0.047 (0.141)</td>
<td>0.021 (0.150)</td>
<td>0.016 (0.148)</td>
<td>0.028 (0.143)</td>
<td>0.021 (0.148)</td>
<td>0.004 (0.148)</td>
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<td><strong>C</strong></td>
<td>-0.013 (0.008)</td>
<td>-0.013 (0.024)</td>
<td>-0.012 (0.023)</td>
<td>-0.009 (0.023)</td>
<td>-0.012 (0.024)</td>
<td>-0.011 (0.024)</td>
<td>-0.009 (0.024)</td>
<td>-0.010 (0.024)</td>
<td>-0.014 (0.024)</td>
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<tr>
<td>Adjusted R²</td>
<td>0.110</td>
<td>0.003</td>
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<td>0.010</td>
<td>0.047</td>
<td>0.075</td>
<td>-0.033</td>
<td>0.014</td>
<td>-0.031</td>
<td>0.007</td>
<td>0.023</td>
<td>0.042</td>
<td>0.079</td>
<td>-0.021</td>
<td>-0.019</td>
<td>0.042</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%
Table 4.2.1 The OLS Residual and Stability Diagnostics of Short-Run Models of Growth in Agriculture’s Share of Real GDP

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>M1</td>
<td>0.645</td>
<td>0.7245</td>
<td>0.4143</td>
<td>0.3275</td>
<td>0.1851</td>
<td>0.1730</td>
<td>0.7934</td>
<td>0.7490</td>
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<tr>
<td>M2</td>
<td>0.341</td>
<td>0.8434</td>
<td>0.3201</td>
<td>0.2402</td>
<td>0.4758</td>
<td>0.4327</td>
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<td>M3</td>
<td>0.427</td>
<td>0.8078</td>
<td>0.4003</td>
<td>0.3141</td>
<td>0.4995</td>
<td>0.4553</td>
<td>0.3326</td>
<td>0.0285</td>
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<td>M4</td>
<td>0.216</td>
<td>0.8977</td>
<td>0.3641</td>
<td>0.2801</td>
<td>0.3435</td>
<td>0.3111</td>
<td>0.5251</td>
<td>0.6105</td>
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<td>M5</td>
<td>0.539</td>
<td>0.7637</td>
<td>0.3431</td>
<td>0.2609</td>
<td>0.1979</td>
<td>0.1839</td>
<td>0.7051</td>
<td>0.9443</td>
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<td>M6</td>
<td>0.075</td>
<td>0.9632</td>
<td>0.2150</td>
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<td>0.3013</td>
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<td>0.3092</td>
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<td>M7</td>
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<td>0.9013</td>
<td>0.3292</td>
<td>0.2332</td>
<td>0.4184</td>
<td>0.3751</td>
<td>0.4950</td>
<td>0.1252</td>
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<tr>
<td>M8</td>
<td>0.396</td>
<td>0.8205</td>
<td>0.2663</td>
<td>0.1797</td>
<td>0.2575</td>
<td>0.2354</td>
<td>0.6606</td>
<td>0.0987</td>
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<tr>
<td>M9</td>
<td>0.232</td>
<td>0.8990</td>
<td>0.3624</td>
<td>0.2629</td>
<td>0.4200</td>
<td>0.3766</td>
<td>0.5855</td>
<td>0.0757</td>
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<tr>
<td>M10</td>
<td>0.491</td>
<td>0.7824</td>
<td>0.3134</td>
<td>0.2194</td>
<td>0.2949</td>
<td>0.2671</td>
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<tr>
<td>M11</td>
<td>0.466</td>
<td>0.7920</td>
<td>0.2724</td>
<td>0.1847</td>
<td>0.1754</td>
<td>0.1667</td>
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<td>0.8387</td>
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<td>M12</td>
<td>0.122</td>
<td>0.9407</td>
<td>0.2254</td>
<td>0.1344</td>
<td>0.5927</td>
<td>0.5311</td>
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<td>0.0514</td>
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<td>M13</td>
<td>0.394</td>
<td>0.8212</td>
<td>0.2238</td>
<td>0.1332</td>
<td>0.3223</td>
<td>0.2897</td>
<td>0.9659</td>
<td>0.1211</td>
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<td>M14</td>
<td>0.445</td>
<td>0.8006</td>
<td>0.2726</td>
<td>0.1708</td>
<td>0.2483</td>
<td>0.2285</td>
<td>0.9850</td>
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<td>M15</td>
<td>0.528</td>
<td>0.7680</td>
<td>0.2899</td>
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<td>0.2731</td>
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<td>M16</td>
<td>0.325</td>
<td>0.8499</td>
<td>0.2458</td>
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<td>0.3722</td>
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<td>PP Test Statistic</td>
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<tr>
<td>Log of agriculture’s share of real GDP</td>
<td>-1.335</td>
<td>-1.323</td>
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<tr>
<td>Log of industry’s share of real GDP</td>
<td>-1.992</td>
<td>-2.046</td>
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<tr>
<td>Log of services’ share of real GDP</td>
<td>0.457</td>
<td>-0.561</td>
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<tr>
<td>Log of real total external debt stock</td>
<td>-3.566**</td>
<td>-3.452**</td>
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<tr>
<td>Log of real long-term external debt stock</td>
<td>-3.440**</td>
<td>-3.321**</td>
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<tr>
<td>Log of real short-term external debt stock</td>
<td>-3.758***</td>
<td>-3.756***</td>
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<tr>
<td>Log of total debt servicing as a percentage of exports</td>
<td>-1.288</td>
<td>-1.267</td>
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<tr>
<td>Log of real workers’ remittances and compensation of employees received</td>
<td>-2.340</td>
<td>-2.401</td>
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<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>-1.419</td>
<td>-1.739</td>
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<tr>
<td>Log of Money and quasi money growth rate</td>
<td>-4.416***</td>
<td>-5.369***</td>
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<tr>
<td>Log of total labour force</td>
<td>1.461</td>
<td>1.667</td>
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<tr>
<td>Log of real capital stock</td>
<td>-7.282***</td>
<td>-5.110***</td>
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</tbody>
</table>

Notes: ADF stands for Augmented Dickey-Fuller; PP stands for Phillips-Peron; ***99%, **95%, and *90%
Table 4.4 Estimation Results of Double-log Agriculture’s Share of Real GDP Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
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<th>Model 10</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>0.181 (0.347)</td>
<td>0.064* (0.033)</td>
<td>0.277 (0.274)</td>
<td>0.024 (0.043)</td>
<td>0.009 (0.040)</td>
<td>0.000 (0.040)</td>
<td>0.000 (0.040)</td>
<td>0.012 (0.295)</td>
<td>-0.172 (0.295)</td>
<td>0.118 (0.259)</td>
<td>0.008 (0.309)</td>
<td>0.106 (0.263)</td>
<td>-0.035 (0.043)</td>
<td>0.032 (0.043)</td>
<td>0.086 (0.268)</td>
<td>0.096 (0.298)</td>
</tr>
<tr>
<td>Log of real long-term external debt stock</td>
<td>0.145 (0.330)</td>
<td>0.007* (0.033)</td>
<td>0.274 (0.274)</td>
<td>0.014 (0.041)</td>
<td>0.000 (0.040)</td>
<td>0.000 (0.040)</td>
<td>0.000 (0.040)</td>
<td>0.017 (0.295)</td>
<td>-0.172 (0.295)</td>
<td>0.118 (0.259)</td>
<td>0.008 (0.309)</td>
<td>0.106 (0.263)</td>
<td>-0.035 (0.043)</td>
<td>0.032 (0.043)</td>
<td>0.086 (0.268)</td>
<td>0.096 (0.298)</td>
</tr>
<tr>
<td>Log of real short-term external debt stock</td>
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<td>0.043** (0.017)</td>
<td>0.034 (0.023)</td>
<td>0.035 (0.022)</td>
<td>0.017 (0.022)</td>
<td>0.031 (0.026)</td>
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<td>0.019 (0.024)</td>
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<tr>
<td>Log of money and quasi money growth rate</td>
<td>0.208*** (0.040)</td>
<td>-0.107*** (0.057)</td>
<td>-0.107** (0.049)</td>
<td>-0.107** (0.049)</td>
<td>-0.107** (0.049)</td>
<td>-0.107* (0.050)</td>
<td>-0.107* (0.054)</td>
<td>-0.099 (0.054)</td>
<td>0.005 (0.055)</td>
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</tr>
<tr>
<td>Log of real workers’ remittances and compensation of employees received</td>
<td>-0.014 (0.018)</td>
<td>-0.014 (0.018)</td>
<td>-0.009 (0.015)</td>
<td>-0.014 (0.018)</td>
<td>-0.008 (0.018)</td>
<td>-0.007 (0.018)</td>
<td>-0.007 (0.018)</td>
<td>-0.008 (0.015)</td>
<td>0.000 (0.019)</td>
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<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>-0.103*** (0.013)</td>
<td>-0.103*** (0.013)</td>
<td>-0.006*** (0.012)</td>
<td>-0.101*** (0.014)</td>
<td>-0.006*** (0.021)</td>
<td>-0.006*** (0.021)</td>
<td>-0.006*** (0.021)</td>
<td>-0.006*** (0.021)</td>
<td>-0.006*** (0.021)</td>
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<tr>
<td>Log of money and quasi money growth rate</td>
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<td>0.004 (0.024)</td>
<td>-0.004 (0.021)</td>
<td>-0.001 (0.022)</td>
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<td>L</td>
<td>0.183 (0.534)</td>
<td>-0.665 (0.467)</td>
<td>-0.583 (0.473)</td>
<td>-0.529 (0.381)</td>
<td>-0.280 (0.267)</td>
<td>-0.374 (0.477)</td>
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<td>-0.681 (0.466)</td>
<td>0.310 (0.371)</td>
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<td>Adjusted R²</td>
<td>0.726</td>
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<td>0.705</td>
<td>0.802</td>
<td>0.784</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%.
Table 4.5  Estimation Results of Short-Run Models of Growth in Industry’s Share of Real GDP

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<th>Model 6</th>
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<th>Model 10</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
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<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>-0.472*</td>
<td>-0.009</td>
<td>-0.252</td>
<td>-0.003</td>
<td>-0.009</td>
<td>-0.295</td>
<td>-0.237</td>
<td>-0.004</td>
<td>-0.304</td>
<td>(0.259)</td>
<td>(0.030)</td>
<td>(0.213)</td>
<td>(0.040)</td>
<td>(0.059)</td>
<td>(0.260)</td>
<td>(0.210)</td>
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<td>-0.002</td>
<td>0.224</td>
<td>0.006</td>
<td>-0.002</td>
<td>0.213</td>
<td>0.229</td>
<td>0.006</td>
<td>0.283</td>
<td>(0.242)</td>
<td>(0.038)</td>
<td>(0.210)</td>
<td>(0.048)</td>
<td>(0.038)</td>
<td>(0.247)</td>
<td>(0.215)</td>
</tr>
<tr>
<td>Growth rate of real short-term external debt stock</td>
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<td>-0.006</td>
<td>0.005</td>
<td>-0.006</td>
<td>-0.006</td>
<td>0.015</td>
<td>-0.008</td>
<td>-0.006</td>
<td>0.016</td>
<td>(0.031)</td>
<td>(0.022)</td>
<td>(0.020)</td>
<td>(0.027)</td>
<td>(0.023)</td>
<td>(0.033)</td>
<td>(0.027)</td>
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<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-0.004</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
<td>0.007</td>
<td>0.010</td>
<td>0.007</td>
<td>0.007</td>
<td>0.010</td>
<td>(0.033)</td>
<td>(0.035)</td>
<td>(0.035)</td>
<td>(0.035)</td>
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<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>-0.047</td>
<td>-0.011</td>
<td>-0.042</td>
<td>-0.007</td>
<td>-0.045</td>
<td>-0.015</td>
<td>-0.041</td>
<td>-0.045</td>
<td>-0.014</td>
<td>(0.031)</td>
<td>(0.021)</td>
<td>(0.031)</td>
<td>(0.021)</td>
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<td>(0.031)</td>
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</tr>
<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>0.033**</td>
<td>0.013**</td>
<td>0.033**</td>
<td>0.033**</td>
<td>0.019**</td>
<td>0.032**</td>
<td>0.039**</td>
<td>0.032**</td>
<td>0.037**</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.016)</td>
<td>(0.015)</td>
<td>(0.016)</td>
<td>(0.017)</td>
<td>(0.016)</td>
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<tr>
<td>Money and quasi-money growth rate</td>
<td>0.004</td>
<td>-0.008</td>
<td>-0.005</td>
<td>-0.004</td>
<td>-0.004</td>
<td>-0.006</td>
<td>-0.005</td>
<td>0.000</td>
<td>-0.001</td>
<td>(0.086)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.021)</td>
<td>(0.021)</td>
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<td>Adjusted R²</td>
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<td>0.005</td>
<td>-0.096</td>
<td>0.033</td>
<td>0.053</td>
<td>0.058</td>
<td>(0.008)</td>
<td>(0.020)</td>
<td>(0.020)</td>
<td>(0.021)</td>
<td>(0.021)</td>
<td>(0.021)</td>
<td>(0.022)</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%
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<td>M1</td>
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<td>0.0339</td>
<td>0.1281</td>
<td>0.0845</td>
<td>0.2422</td>
<td>0.2220</td>
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<td>M2</td>
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<td>0.5814</td>
<td>0.3401</td>
<td>0.2581</td>
<td>0.9425</td>
<td>0.9274</td>
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<td>0.3978</td>
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<td>0.9077</td>
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<td>0.2027</td>
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<td>0.9453</td>
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<td>0.5834</td>
<td>0.4373</td>
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<td>0.3878</td>
<td>0.3453</td>
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<td>M14</td>
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<td>0.4013</td>
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<td>0.4125</td>
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<td>Model 8</td>
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</tr>
<tr>
<td>Log of real total external debt stock</td>
<td>-0.706**</td>
<td>-0.046*</td>
<td>-0.209</td>
<td>-0.082**</td>
<td>-0.025</td>
<td>-0.172</td>
<td>-0.026</td>
<td>-0.172</td>
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<tr>
<td>Log of real long-term external debt stock</td>
<td>-0.473**</td>
<td>-0.216</td>
<td>0.203</td>
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<td>0.026</td>
<td>-0.025</td>
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<tr>
<td>Log of real short-term external debt stock</td>
<td>0.068**</td>
<td>0.018</td>
<td>0.018</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
<td>0.015</td>
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<tr>
<td>Log of total debt servicing as a percentage of exports</td>
<td>0.114***</td>
<td>0.068</td>
<td>0.068</td>
<td>0.068</td>
<td>0.068</td>
<td>0.068</td>
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<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>0.015***</td>
<td>0.002</td>
<td>0.002</td>
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<td>0.002</td>
<td>0.002</td>
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<td>0.002</td>
</tr>
<tr>
<td>Log of money and quasi money growth rate</td>
<td>0.003</td>
<td>0.003</td>
<td>0.003</td>
<td>0.003</td>
<td>0.003</td>
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<tr>
<td>K</td>
<td>-1.750***</td>
<td>-1.504***</td>
<td>-1.365***</td>
<td>-1.284***</td>
<td>-1.164***</td>
<td>-1.321***</td>
<td>-1.304***</td>
<td>-1.321***</td>
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<tr>
<td>Adjusted R²</td>
<td>0.563</td>
<td>0.608</td>
<td>0.576</td>
<td>0.620</td>
<td>0.616</td>
<td>0.603</td>
<td>0.596</td>
<td>0.598</td>
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Notes: Figures in parentheses are standard errors; **99%, *95%, and *90%.
## Table 4.7 Estimation Results of Short-Run Models of Growth in the Services’ Share of Real GDP

**Dependent Variable:** Growth rate of the services’ share of real GDP

<table>
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<tr>
<th>Variable</th>
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<th>Model 3</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>-0.015 (0.127)</td>
<td>-0.012 (0.118)</td>
<td>-0.003 (0.104)</td>
<td>-0.003 (0.023)</td>
<td>-0.003 (0.019)</td>
<td>-0.004 (0.126)</td>
<td>-0.004 (0.024)</td>
<td>-0.004 (0.126)</td>
<td>-0.004 (0.024)</td>
<td>-0.016 (0.013)</td>
<td>-0.017 (0.018)</td>
<td>-0.019 (0.023)</td>
<td>-0.022 (0.019)</td>
<td>-0.019 (0.126)</td>
<td>-0.021 (0.024)</td>
<td>-0.022 (0.131)</td>
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<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>0.006 (0.118)</td>
<td>-0.019 (0.118)</td>
<td>-0.023 (0.102)</td>
<td>-0.023 (0.019)</td>
<td>-0.019 (0.115)</td>
<td>-0.019 (0.105)</td>
<td>-0.018 (0.100)</td>
<td>-0.018 (0.105)</td>
<td>-0.019 (0.110)</td>
<td>-0.019 (0.105)</td>
<td>-0.023 (0.122)</td>
<td>-0.019 (0.115)</td>
<td>-0.019 (0.125)</td>
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</tr>
<tr>
<td>Growth rate of real short-term external debt stock</td>
<td>-0.006 (0.151)</td>
<td>0.038 (0.014)</td>
<td>0.054 (0.131)</td>
<td>-0.038 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
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<td>0.054 (0.016)</td>
<td>0.054 (0.016)</td>
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</tr>
<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>0.007 (0.016)</td>
<td>0.001 (0.016)</td>
<td>0.001 (0.016)</td>
<td>0.001 (0.016)</td>
<td>0.001 (0.016)</td>
<td>0.001 (0.016)</td>
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<td>0.001 (0.016)</td>
<td>0.001 (0.016)</td>
<td></td>
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</tr>
<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>0.017* (0.015)</td>
<td>0.025 (0.015)</td>
<td>0.014 (0.015)</td>
<td>0.012 (0.015)</td>
<td>0.028* (0.015)</td>
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<td>Growth rate of real foreign direct investment net inflows</td>
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<td>-0.004 (0.007)</td>
<td>-0.004 (0.007)</td>
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<tr>
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<td>Adjusted R²</td>
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<td>-0.096</td>
<td>-0.052</td>
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<td>-0.024</td>
<td>-0.078</td>
<td>-0.070</td>
<td>-0.072</td>
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**Notes:** Figures in parentheses are standard errors; ***99%, **95%, and *90%
Table 4.7.1 The OLS Residual and Stability Diagnostics of Short-Run Models of Growth in the Services’ Share of Real GDP

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Table 4.8 Estimation Results of Double-log Services’ Share of Real GDP Models

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<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
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<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>0.229**</td>
<td>-0.001</td>
<td>0.097</td>
<td>0.026</td>
<td>0.013</td>
<td>0.272*</td>
<td>0.128</td>
<td>0.022</td>
<td>0.272*</td>
<td>0.128</td>
<td>0.022</td>
<td>0.272*</td>
<td>0.128</td>
<td>0.022</td>
<td>0.272*</td>
<td>0.128</td>
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<tr>
<td></td>
<td>(0.139)</td>
<td>(0.016)</td>
<td>(0.133)</td>
<td>(0.020)</td>
<td>(0.021)</td>
<td>(0.134)</td>
<td>(0.135)</td>
<td>(0.022)</td>
<td>(0.134)</td>
<td>(0.135)</td>
<td>(0.022)</td>
<td>(0.134)</td>
<td>(0.135)</td>
<td>(0.022)</td>
<td>(0.134)</td>
<td>(0.135)</td>
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<tr>
<td>Log of real long-term external debt stock</td>
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<td>-0.001</td>
<td>-0.009</td>
<td>0.008</td>
<td>0.009</td>
<td>0.008</td>
<td>0.009</td>
<td>0.009</td>
<td>0.009</td>
<td>0.009</td>
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<td>(0.128)</td>
<td>(0.133)</td>
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<td>Log of real short-term external debt stock</td>
<td>-0.027**</td>
<td>-0.013</td>
<td>-0.022**</td>
<td>-0.020*</td>
<td>-0.015</td>
<td>-0.021*</td>
<td>-0.014</td>
<td>-0.021*</td>
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<td>-0.020*</td>
<td>-0.014</td>
<td>-0.021*</td>
<td>-0.017</td>
<td>-0.019</td>
<td>-0.027**</td>
</tr>
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<td></td>
<td>(0.032)</td>
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<td>(0.011)</td>
<td>(0.010)</td>
<td>(0.011)</td>
<td>(0.012)</td>
<td>(0.010)</td>
<td>(0.012)</td>
<td>(0.011)</td>
<td>(0.012)</td>
<td>(0.010)</td>
<td>(0.012)</td>
<td>(0.011)</td>
<td>(0.012)</td>
<td>(0.010)</td>
<td>(0.012)</td>
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<tr>
<td>Log of total debt servicing as a percentage of</td>
<td>-0.039**</td>
<td>-0.013</td>
<td>-0.026</td>
<td>-0.024</td>
<td>-0.007</td>
<td>0.000</td>
<td>-0.008</td>
<td>-0.006</td>
<td>-0.008</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>-0.000</td>
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<tr>
<td>exports</td>
<td>(0.016)</td>
<td>(0.019)</td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.008)</td>
<td>(0.026)</td>
<td>(0.027)</td>
<td>(0.025)</td>
<td>(0.026)</td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.026)</td>
<td>(0.025)</td>
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<td>Log of real workers’ remittances and</td>
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<td>0.005</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
<td>0.006</td>
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<td>0.006</td>
<td>0.006</td>
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<tr>
<td>compensation of employees received</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.007)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
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<td>(0.009)</td>
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<td>Log of real foreign direct investment net</td>
<td>0.024**</td>
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<td>-0.005</td>
<td>-0.005</td>
<td>-0.005</td>
<td>-0.005</td>
<td>-0.005</td>
<td>-0.005</td>
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<td>inflows</td>
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<td>(0.011)</td>
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<td>(0.012)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.011)</td>
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<td>(0.011)</td>
<td>(0.011)</td>
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<tr>
<td>Log of money and quasi money growth rate</td>
<td>-1.153***</td>
<td>-1.165***</td>
<td>-1.141***</td>
<td>-1.115***</td>
<td>-1.223***</td>
<td>-1.115***</td>
<td>-1.223***</td>
<td>-1.115***</td>
<td>-1.223***</td>
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<td>-1.223***</td>
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<td>-1.223***</td>
<td>-1.115***</td>
<td>-1.223***</td>
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<td>(0.206)</td>
<td>(0.236)</td>
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<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
<td>(0.226)</td>
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<tr>
<td>Adjusted R²</td>
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<td>0.542</td>
<td>0.585</td>
<td>0.558</td>
<td>0.534</td>
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<td>0.543</td>
<td>0.585</td>
<td>0.540</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%.
Table 4.9 Estimation Results of Short-Run Models of Growth in Agriculture’s Share of Real GDP

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<th>Model 14</th>
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<th>Model 16</th>
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<td>Growth rate of total capital stock</td>
<td>0.542* (0.270)</td>
<td>0.015</td>
<td>0.010</td>
<td>0.015</td>
<td>0.479* (0.286)</td>
<td>-0.011</td>
<td>0.045</td>
<td>0.045</td>
<td>0.046</td>
<td>0.482* (0.285)</td>
<td>-0.005</td>
<td>0.463</td>
<td>0.046</td>
<td>0.463</td>
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<td>Growth rate of real long-term external debt stock</td>
<td>-0.517* (0.252)</td>
<td>-0.048* (0.305)</td>
<td>0.008</td>
<td>-0.449 (0.261)</td>
<td>-0.023</td>
<td>-0.010</td>
<td>-0.551</td>
<td>-0.482* (0.258)</td>
<td>-0.020</td>
<td>-0.395* (0.354)</td>
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<td>Growth rate of short-term external debt stock</td>
<td>-0.023 (0.032)</td>
<td>-0.013 (0.045)</td>
<td>0.027</td>
<td>-0.052 (0.042)</td>
<td>-0.018</td>
<td>-0.024</td>
<td>-0.023</td>
<td>0.024</td>
<td>0.028</td>
<td>0.033</td>
<td>-0.033</td>
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<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>0.045 (0.014)</td>
<td>0.013 (0.037)</td>
<td>0.086 (0.042)</td>
<td>0.041 (0.043)</td>
<td>0.041 (0.044)</td>
<td>0.041 (0.044)</td>
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<td>0.044 (0.031)</td>
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<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>0.007 (0.041)</td>
<td>0.013 (0.039)</td>
<td>-0.009 (0.027)</td>
<td>0.016 (0.023)</td>
<td>-0.002 (0.042)</td>
<td>-0.015 (0.041)</td>
<td>-0.011 (0.040)</td>
<td>-0.009 (0.020)</td>
<td>-0.001 (0.043)</td>
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<td>-0.011 (0.043)</td>
<td>-0.006 (0.040)</td>
<td>-0.032 (0.040)</td>
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<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>-0.024 (0.022)</td>
<td>-0.025 (0.022)</td>
<td>-0.025 (0.021)</td>
<td>-0.020 (0.022)</td>
<td>-0.013 (0.022)</td>
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<td>-0.021 (0.022)</td>
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<td>0.018</td>
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<tr>
<td>Money and quasi-money growth rate</td>
<td>0.021 (0.101)</td>
<td>0.020 (0.102)</td>
<td>0.012 (0.101)</td>
<td>0.023 (0.102)</td>
<td>0.004 (0.154)</td>
<td>-0.008 (0.164)</td>
<td>0.005 (0.163)</td>
<td>0.015 (0.162)</td>
<td>0.020 (0.160)</td>
<td>0.015 (0.168)</td>
<td>0.016 (0.167)</td>
<td>0.016 (0.161)</td>
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<td>Growth rate of total labour force</td>
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<td>The first-differentiation growth rate of real capital stock</td>
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<td>Adjusted R²</td>
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Notes: Figures in parentheses are standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.
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<td>0.1755</td>
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<td>0.6321</td>
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<td>0.5946</td>
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<td>M13</td>
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<td>M16</td>
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Table 4.10 Estimation Results of Double-log Agriculture’s Share of Real GDP Models

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<th>New Model 1</th>
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<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>0.181 (0.347)</td>
<td>0.566* (0.280)</td>
<td>-0.061 (0.044)</td>
<td>0.201 (0.263)</td>
<td>0.162** (0.035)</td>
<td>0.060 (0.046)</td>
<td>0.830*** (0.230)</td>
<td>0.182 (0.266)</td>
<td>0.156*** (0.055)</td>
<td>0.834*** (0.298)</td>
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<tr>
<td>Log of real short-term external debt stock</td>
<td>-0.253 (0.330)</td>
<td>-0.509* (0.262)</td>
<td>0.061 (0.043)</td>
<td>-0.133 (0.057)</td>
<td>0.123** (0.016)</td>
<td>0.054 (0.046)</td>
<td>-0.613** (0.233)</td>
<td>-0.121 (0.262)</td>
<td>0.118* (0.051)</td>
<td>-0.620*** (0.235)</td>
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<tr>
<td>Log of total debt servicing as percentage of exports</td>
<td>0.008 (0.031)</td>
<td>-0.019*** (0.026)</td>
<td>-0.013 (0.024)</td>
<td>-0.012** (0.027)</td>
<td>-0.015** (0.027)</td>
<td>-0.030 (0.024)</td>
<td>-0.114*** (0.028)</td>
<td>-0.014** (0.027)</td>
<td>-0.114*** (0.029)</td>
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<tr>
<td>Log of workers’ remittances and compensation of employees received</td>
<td>0.008*** (0.040)</td>
<td>0.004 (0.008)</td>
<td>0.005 (0.009)</td>
<td>0.004 (0.007)</td>
<td>0.006 (0.008)</td>
<td>0.018 (0.008)</td>
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<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>-0.041 (0.031)</td>
<td>-0.057 (0.051)</td>
<td>0.003 (0.020)</td>
<td>-0.039 (0.052)</td>
<td>-0.076** (0.051)</td>
<td>-0.041 (0.031)</td>
<td>-0.019* (0.011)</td>
<td>-0.038 (0.032)</td>
<td>-0.004 (0.020)</td>
<td>-0.093*** (0.028)</td>
<td>-0.040 (0.032)</td>
<td>-0.078*** (0.031)</td>
<td>-0.062* (0.011)</td>
<td>-0.094*** (0.028)</td>
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<tr>
<td>Log of money and quasi money growth rate</td>
<td>-0.051 (0.019)</td>
<td>-0.002 (0.020)</td>
<td>0.000 (0.020)</td>
<td>-0.001 (0.020)</td>
<td>-0.001 (0.018)</td>
<td>-0.011 (0.015)</td>
<td>-0.001 (0.018)</td>
<td>-0.004 (0.015)</td>
<td>-0.006 (0.018)</td>
<td>0.007 (0.015)</td>
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<td>0.001 (0.018)</td>
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<tr>
<td>Log of total labour force</td>
<td>-0.014* (0.061)</td>
<td>-0.018 (0.779)</td>
<td>-0.140 (0.642)</td>
<td>-1.247* (0.764)</td>
<td>-0.383 (0.768)</td>
<td>-0.011 (0.692)</td>
<td>-0.014 (0.717)</td>
<td>-0.211 (0.910)</td>
<td>0.218 (0.832)</td>
<td>0.634 (0.834)</td>
<td>0.109 (0.805)</td>
<td>-0.727 (0.842)</td>
<td>-0.589 (0.756)</td>
<td>0.821 (0.825)</td>
<td>0.401* (0.727)</td>
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<tr>
<td>Log of real capital stock</td>
<td>-0.190 (0.172)</td>
<td>0.000 (0.290)</td>
<td>0.091 (0.247)</td>
<td>0.029 (0.193)</td>
<td>0.028 (0.256)</td>
<td>0.160 (0.129)</td>
<td>0.017 (0.079)</td>
<td>0.165 (0.082)</td>
<td>0.188 (0.109)</td>
<td>0.305 (0.109)</td>
<td>0.191 (0.113)</td>
<td>0.005 (0.008)</td>
<td>-0.060 (0.022)</td>
<td>-0.094 (0.022)</td>
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<tr>
<td>Adjusted R²</td>
<td>0.728</td>
<td>-0.031</td>
<td>0.053</td>
<td>0.169</td>
<td>0.083</td>
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<td>0.169</td>
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Notes: Figures in parentheses are standard errors. ***99%, **95%, and *90%
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<th>New Model 1</th>
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<tr>
<td>Growth rate of real total external debt stock</td>
<td>-0.472* (0.259)</td>
<td>-0.665* (0.321)</td>
<td>-0.015 (0.049)</td>
<td>-0.324 (0.249)</td>
<td>-0.014 (0.055)</td>
<td>-0.019 (0.046)</td>
<td>-0.533 (0.336)</td>
<td>-0.324 (0.245)</td>
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<td>Growth rate of real long-term external debt stock</td>
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<td>0.609* (0.296)</td>
<td>-0.009 (0.042)</td>
<td>0.259 (0.234)</td>
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<td>-0.011 (0.033)</td>
<td>0.081 (0.085)</td>
<td>-0.009 (0.043)</td>
<td>0.499 (0.246)</td>
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<td>Growth rate of real short-term external debt stock</td>
<td>0.038 (0.031)</td>
<td>0.165 (0.044)</td>
<td>-0.005 (0.027)</td>
<td>-0.005 (0.037)</td>
<td>-0.010 (0.027)</td>
<td>0.041 (0.047)</td>
<td>-0.008 (0.034)</td>
<td>-0.011 (0.046)</td>
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<tr>
<td>Growth rate of total debt servicing as a percentage of exports</td>
<td>-0.004 (0.033)</td>
<td>-0.016 (0.036)</td>
<td>0.000 (0.057)</td>
<td>-0.001 (0.038)</td>
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<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>-0.022 (0.033)</td>
<td>-0.029 (0.034)</td>
<td>-0.029 (0.024)</td>
<td>-0.034 (0.021)</td>
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<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>0.065** (0.019)</td>
<td>0.046** (0.019)</td>
<td>0.047** (0.018)</td>
<td>0.039** (0.017)</td>
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<td>Money and quasi money growth rate</td>
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<tr>
<td>Growth rate of total labour force</td>
<td>-0.764 (0.081)</td>
<td>-0.528 (0.083)</td>
<td>-0.475 (0.084)</td>
<td>-0.507 (0.087)</td>
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<td>-0.718 (0.082)</td>
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<td>-0.602 (0.086)</td>
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<td>-0.503 (0.093)</td>
<td>-0.844 (0.099)</td>
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<td>0.004 (0.008)</td>
<td>0.015 (0.021)</td>
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<td>0.000 (0.031)</td>
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<td>0.009 (0.033)</td>
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<tr>
<td>Adjusted R²</td>
<td>-0.012 (0.018)</td>
<td>-0.013 (0.032)</td>
<td>-0.012 (0.008)</td>
<td>-0.011 (0.007)</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%.
Table 4.11.1  The OLS Residual and Stability Diagnostics of Short-Run Models of Growth in the Industry’s Share of Real GDP

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Table 4.12 Estimation Results of Double-log Industry’s Share of Real GDP Models

Dependent Variable: log of industry’s share of real GDP

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<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
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</thead>
<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>-0.306*** (0.209)</td>
<td>-0.609*** (0.190)</td>
<td>-0.024 (0.031)</td>
<td>-0.179 (0.214)</td>
<td>-0.018* (0.043)</td>
<td>-0.017 (0.037)</td>
<td>-0.064*** (0.226)</td>
<td>-0.161 (0.217)</td>
<td>-0.052* (0.046)</td>
<td>-0.636** (0.226)</td>
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<tr>
<td>Log of real long-term external debt stock</td>
<td>0.493**+ (0.190)</td>
<td>0.519*** (0.143)</td>
<td>-0.016 (0.035)</td>
<td>0.155 (0.210)</td>
<td>-0.081 (0.042)</td>
<td>-0.012 (0.036)</td>
<td>0.510**+ (0.204)</td>
<td>0.143 (0.212)</td>
<td>-0.016* (0.042)</td>
<td>0.508**+ (0.203)</td>
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<tr>
<td>Log of real short-term external debt stock</td>
<td>0.086*** (0.019)</td>
<td>0.023**+ (0.019)</td>
<td>0.016 (0.018)</td>
<td>0.046*** (0.024)</td>
<td>0.018 (0.022)</td>
<td>0.022 (0.019)</td>
<td>0.018**+ (0.023)</td>
<td>0.005** (0.024)</td>
<td>0.004* (0.022)</td>
<td>0.064*** (0.025)</td>
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<tr>
<td>Log of total debt servicing as percentage of exports</td>
<td>-0.012*** (0.024)</td>
<td>-0.015 (0.038)</td>
<td>-0.045 (0.046)</td>
<td>-0.045 (0.046)</td>
<td>-0.045 (0.046)</td>
<td>-0.045 (0.046)</td>
<td>-0.045 (0.046)</td>
<td>-0.045 (0.046)</td>
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<tr>
<td>Log of real workers’ remittances and compensation of employees received</td>
<td>-0.011 (0.025)</td>
<td>-0.020 (0.025)</td>
<td>-0.015**+ (0.015)</td>
<td>-0.025 (0.026)</td>
<td>0.006 (0.027)</td>
<td>-0.016 (0.026)</td>
<td>-0.018 (0.026)</td>
<td>-0.018 (0.026)</td>
<td>-0.018 (0.026)</td>
<td>0.022 (0.024)</td>
<td>-0.013 (0.026)</td>
<td>-0.002 (0.026)</td>
<td>0.023 (0.024)</td>
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<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>0.049*** (0.013)</td>
<td>0.044*** (0.013)</td>
<td>0.037**+ (0.017)</td>
<td>0.039*** (0.016)</td>
<td>0.046***+ (0.016)</td>
<td>0.032 (0.016)</td>
<td>0.047**+ (0.017)</td>
<td>0.035** (0.016)</td>
<td>0.043**+ (0.017)</td>
<td>0.027 (0.019)</td>
<td>0.013 (0.016)</td>
<td>0.041**+ (0.018)</td>
<td>0.024 (0.018)</td>
<td>0.026 (0.018)</td>
<td>0.009 (0.017)</td>
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<tr>
<td>Log of money and quasi-money growth rate</td>
<td>0.005 (0.016)</td>
<td>0.005 (0.016)</td>
<td>0.006 (0.016)</td>
<td>0.006 (0.016)</td>
<td>0.006 (0.016)</td>
<td>0.002 (0.015)</td>
<td>0.004 (0.016)</td>
<td>0.004 (0.016)</td>
<td>0.004 (0.016)</td>
<td>-0.003 (0.015)</td>
<td>0.035 (0.016)</td>
<td>-0.001 (0.016)</td>
<td>0.004 (0.016)</td>
<td>-0.001 (0.016)</td>
<td>-0.004 (0.015)</td>
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<tr>
<td>Log of total labor force</td>
<td>0.187 (0.033)</td>
<td>0.169 (0.033)</td>
<td>0.060 (0.048)</td>
<td>0.249 (0.068)</td>
<td>0.245 (0.069)</td>
<td>0.318 (0.074)</td>
<td>0.513 (0.073)</td>
<td>0.531 (0.063)</td>
<td>0.513 (0.073)</td>
<td>0.515 (0.075)</td>
<td>0.518 (0.070)</td>
<td>0.518 (0.070)</td>
<td>0.518 (0.070)</td>
<td>0.518 (0.070)</td>
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<tr>
<td>Log of total capital stock</td>
<td>0.065 (0.121)</td>
<td>0.125 (0.208)</td>
<td>0.184**+ (0.130)</td>
<td>0.268 (0.187)</td>
<td>0.268 (0.187)</td>
<td>0.268 (0.187)</td>
<td>0.268 (0.187)</td>
<td>0.268 (0.187)</td>
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<tr>
<td>A</td>
<td>1.097*** (10.403)</td>
<td>0.649*** (16.875)</td>
<td>0.197*** (17.728)</td>
<td>0.133 (15.580)</td>
<td>0.124 (17.172)</td>
<td>0.174 (15.975)</td>
<td>0.132 (19.427)</td>
<td>0.174 (15.975)</td>
<td>0.132 (19.427)</td>
<td>0.174 (15.975)</td>
<td>0.132 (19.427)</td>
<td>0.174 (15.975)</td>
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<td>0.174 (15.975)</td>
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<td>Adj. R²</td>
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<td>0.613</td>
<td>0.795</td>
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Notes: Figures in parentheses are standard errors. ***0.01%, **0.05%, and *0.10%
Table 4.13 Estimation Results of Short-Run Models of Growth in the Services’ Share of Real GDP

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<th>Variable</th>
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<th>Model 15</th>
<th>Model 16</th>
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<tbody>
<tr>
<td>Growth rate of real total external debt stock</td>
<td>-0.073 (0.127)</td>
<td>-0.044 (0.156)</td>
<td>0.011 (0.039)</td>
<td>-0.106 (0.121)</td>
<td>-0.016 (0.027)</td>
<td>-0.021 (0.020)</td>
<td>-0.118 (0.119)</td>
<td>-0.106 (0.113)</td>
<td>-0.014 (0.028)</td>
<td>-0.164 (0.173)</td>
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<tr>
<td>Growth rate of real long-term external debt stock</td>
<td>0.008 (0.118)</td>
<td>0.001 (0.144)</td>
<td>-0.015 (0.019)</td>
<td>0.004 (0.109)</td>
<td>-0.013 (0.024)</td>
<td>-0.018 (0.020)</td>
<td>0.131 (0.148)</td>
<td>0.044 (0.112)</td>
<td>-0.012 (0.025)</td>
<td>0.130 (0.154)</td>
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<td>Growth rate of growth rate of total debt servicing as a percentage of exports</td>
<td>0.0006 (0.015)</td>
<td>-0.0102 (0.012)</td>
<td>-0.0100 (0.017)</td>
<td>-0.0007 (0.015)</td>
<td>-0.0100 (0.017)</td>
<td>-0.0100 (0.017)</td>
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<tr>
<td>Growth rate of real workers’ remittances and compensation of employees received</td>
<td>0.016 (0.016)</td>
<td>0.015 (0.017)</td>
<td>0.005 (0.017)</td>
<td>0.004 (0.017)</td>
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<tr>
<td>Growth rate of real foreign direct investment net inflows</td>
<td>-0.017 (0.009)</td>
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<td>-0.013 (0.008)</td>
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<tr>
<td>Money and quasi money growth rate</td>
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<td>-0.002 (0.004)</td>
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<td>Growth rate of total labor force</td>
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<td>The first-differenced growth rate of real capital stock</td>
<td>1.193 (1.051)</td>
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<td>1.626 (1.586)</td>
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<tr>
<td>C</td>
<td>0.006 (0.014)</td>
<td>0.015 (0.016)</td>
<td>0.015 (0.016)</td>
<td>0.012 (0.012)</td>
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<td>Adjusted R²</td>
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Notes: Figures in parentheses are standard errors; ***99%, **95%, and *90%
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<td>0.9486</td>
<td>0.0702</td>
<td>0.0267</td>
<td>0.7966</td>
<td>0.7263</td>
<td>0.4794</td>
<td>0.3959</td>
</tr>
<tr>
<td>M7</td>
<td>0.079</td>
<td>0.9615</td>
<td>0.0970</td>
<td>0.0392</td>
<td>0.8633</td>
<td>0.8045</td>
<td>0.3642</td>
<td>0.3970</td>
</tr>
<tr>
<td>M8</td>
<td>0.062</td>
<td>0.9695</td>
<td>0.0417</td>
<td>0.0148</td>
<td>0.8365</td>
<td>0.7723</td>
<td>0.3338</td>
<td>0.1691</td>
</tr>
<tr>
<td>M9</td>
<td>0.126</td>
<td>0.9390</td>
<td>0.0943</td>
<td>0.0379</td>
<td>0.9155</td>
<td>0.8713</td>
<td>0.3738</td>
<td>0.3665</td>
</tr>
<tr>
<td>M10</td>
<td>0.085</td>
<td>0.9584</td>
<td>0.0462</td>
<td>0.0166</td>
<td>0.9023</td>
<td>0.8538</td>
<td>0.3095</td>
<td>0.1271</td>
</tr>
<tr>
<td>M11</td>
<td>0.252</td>
<td>0.8816</td>
<td>0.0518</td>
<td>0.0189</td>
<td>0.9505</td>
<td>0.9200</td>
<td>0.4344</td>
<td>0.3333</td>
</tr>
<tr>
<td>M12</td>
<td>0.141</td>
<td>0.9317</td>
<td>0.0886</td>
<td>0.0294</td>
<td>0.6526</td>
<td>0.5675</td>
<td>0.4908</td>
<td>0.4334</td>
</tr>
<tr>
<td>M13</td>
<td>0.126</td>
<td>0.9391</td>
<td>0.0405</td>
<td>0.0116</td>
<td>0.8345</td>
<td>0.7600</td>
<td>0.4628</td>
<td>0.3048</td>
</tr>
<tr>
<td>M14</td>
<td>0.080</td>
<td>0.9607</td>
<td>0.0494</td>
<td>0.0145</td>
<td>0.8895</td>
<td>0.8283</td>
<td>0.3557</td>
<td>0.1869</td>
</tr>
<tr>
<td>M15</td>
<td>0.118</td>
<td>0.9428</td>
<td>0.0529</td>
<td>0.0158</td>
<td>0.9320</td>
<td>0.8863</td>
<td>0.3644</td>
<td>0.2036</td>
</tr>
<tr>
<td>M16</td>
<td>0.155</td>
<td>0.9255</td>
<td>0.0546</td>
<td>0.0130</td>
<td>0.7408</td>
<td>0.6462</td>
<td>0.4856</td>
<td>0.2575</td>
</tr>
</tbody>
</table>

Table 4.13.1: The OLS Residual and Stability Diagnostics of Short-Run Models of Growth in the Services’ Share of Real GDP
Table 4.14  Estimation Results of Double-log Model of Services’ Share of Real GDP Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>Original Model 1</th>
<th>New Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
<th>Model 10</th>
<th>Model 11</th>
<th>Model 12</th>
<th>Model 13</th>
<th>Model 14</th>
<th>Model 15</th>
<th>Model 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of real total external debt stock</td>
<td>0.25**</td>
<td>0.02</td>
<td>-0.011</td>
<td>-0.017</td>
<td>-0.051</td>
<td>-0.051**</td>
<td>-0.021</td>
<td>-0.021</td>
<td>-0.121</td>
<td>-0.035**</td>
<td>-0.035**</td>
<td>-0.128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real long-term external debt stock</td>
<td>-0.104</td>
<td>-0.019</td>
<td>-0.014</td>
<td>-0.014</td>
<td>-0.006</td>
<td>-0.006</td>
<td>-0.024</td>
<td>-0.024</td>
<td>-0.483</td>
<td>-0.006</td>
<td>-0.483</td>
<td>-0.108</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real short-term external debt stock</td>
<td>-0.027***</td>
<td>-0.007</td>
<td>0.008</td>
<td>0.012</td>
<td>0.026**</td>
<td>0.026**</td>
<td>0.026**</td>
<td>0.026**</td>
<td>0.013</td>
<td>0.041***</td>
<td>0.026**</td>
<td>0.041***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of total debt servicing as percentage of exports</td>
<td>-0.029***</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.017</td>
<td>0.017</td>
<td>0.023</td>
<td>0.023</td>
<td>0.023</td>
<td>0.023</td>
<td>0.023</td>
<td>0.023</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real workers’ remittances and compensation of employees received</td>
<td>0.027**</td>
<td>0.028**</td>
<td>0.014**</td>
<td>0.024**</td>
<td>0.035**</td>
<td>0.036**</td>
<td>0.027**</td>
<td>0.027**</td>
<td>0.013</td>
<td>0.041**</td>
<td>0.026**</td>
<td>0.041**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real foreign direct investment net inflows</td>
<td>-0.006</td>
<td>-0.006</td>
<td>-0.012</td>
<td>-0.012</td>
<td>-0.006</td>
<td>-0.006</td>
<td>-0.015*</td>
<td>-0.015*</td>
<td>-0.002</td>
<td>-0.014*</td>
<td>-0.002</td>
<td>-0.014*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of money and quasi money growth rate</td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.003</td>
<td>-0.004</td>
<td>-0.007</td>
<td>-0.005</td>
<td>-0.005</td>
<td>-0.006</td>
<td>-0.007</td>
<td>-0.006</td>
<td>-0.007</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of total labour force</td>
<td>0.596**</td>
<td>-0.126</td>
<td>0.133</td>
<td>0.128</td>
<td>0.096</td>
<td>0.301</td>
<td>-0.139</td>
<td>-0.140</td>
<td>-0.140</td>
<td>-0.144</td>
<td>-0.142</td>
<td>-0.120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of real capital stock</td>
<td>-0.308</td>
<td>-0.308</td>
<td>0.115</td>
<td>0.115</td>
<td>0.056</td>
<td>0.146</td>
<td>0.165</td>
<td>0.159</td>
<td>0.140</td>
<td>0.145</td>
<td>0.138</td>
<td>0.138</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.456</td>
<td>0.735</td>
<td>0.781</td>
<td>0.783</td>
<td>0.777</td>
<td>0.777</td>
<td>0.819</td>
<td>0.813</td>
<td>0.772</td>
<td>0.813</td>
<td>0.772</td>
<td>0.813</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses are standard errors. ***, ***, and * denote significance at the 1%, 5%, and 10% level, respectively.
### Table 4.15 Results of Johansen Cointegration Rank Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Null Eigenvalue</th>
<th>Maximum Eigenvalue</th>
<th>5 Percent Critical Value</th>
<th>Probability</th>
<th>Trace Statistic</th>
<th>5 Percent Critical Value</th>
<th>Probability**</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0</td>
<td>0.949889</td>
<td>77.83141*</td>
<td>33.87687</td>
<td>0.0000</td>
<td>160.4160*</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>r=1</td>
<td>0.805165</td>
<td>42.52664*</td>
<td>27.58434</td>
<td>0.0003</td>
<td>82.58451*</td>
<td>47.85613</td>
<td>0.0000</td>
</tr>
<tr>
<td>r=2</td>
<td>0.600136</td>
<td>23.83238*</td>
<td>21.13162</td>
<td>0.0203</td>
<td>40.05894*</td>
<td>29.79707</td>
<td>0.0024</td>
</tr>
<tr>
<td>r=3</td>
<td>0.416239</td>
<td>13.99483</td>
<td>14.26460</td>
<td>0.0551</td>
<td>16.22655*</td>
<td>15.49471</td>
<td>0.0387</td>
</tr>
<tr>
<td>r=4</td>
<td>0.082255</td>
<td>2.231720</td>
<td>3.841466</td>
<td>0.1352</td>
<td>2.231720</td>
<td>3.841466</td>
<td>0.1352</td>
</tr>
</tbody>
</table>

*denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

### Table 4.16 Cointegrating Equations Based on the Normalized Cointegrating Coefficients

<table>
<thead>
<tr>
<th>Number of Co-integrating Equations</th>
<th>Log Likelihood</th>
<th>Dependent Variable of Interest</th>
<th>Growth rate of agriculture’s share of real GDP</th>
<th>Growth rate of real long-term external debt stock</th>
<th>Growth rate of real short-term external debt stock</th>
<th>Growth rate of total debt servicing as a percentage of exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>144.945</td>
<td>Growth rate of agriculture’s share of real GDP</td>
<td>1.000 (0.263)</td>
<td>-0.414 (0.242)</td>
<td>0.072 (0.027)</td>
<td>-0.036 (0.029)</td>
</tr>
<tr>
<td>2</td>
<td>166.207</td>
<td>Growth rate of agriculture’s share of real GDP</td>
<td>1.000 (0.356)</td>
<td>-0.405 (0.302)</td>
<td>0.712 (0.302)</td>
<td>-3.192 (0.491)</td>
</tr>
<tr>
<td>3</td>
<td>178.124</td>
<td>Growth rate of agriculture’s share of Real GDP</td>
<td>1.000 (0.125)</td>
<td>0.000 (0.125)</td>
<td>-0.413 (0.125)</td>
<td>2.303 (0.347)</td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses are standard errors
### Table 4.17: Results of Johansen Cointegration Rank Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Eigenvalue</th>
<th>Maximum Eigenvalue</th>
<th>5 Percent Critical Value</th>
<th>Probability**</th>
<th>Trace Statistic</th>
<th>5 Percent Critical Value</th>
<th>Probability**</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0</td>
<td>0.935390</td>
<td>71.22384*</td>
<td>33.87687</td>
<td>0.0000</td>
<td>159.3717*</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>r=1</td>
<td>0.796586</td>
<td>41.40525*</td>
<td>27.58434</td>
<td>0.0005</td>
<td>88.14782*</td>
<td>47.85613</td>
<td>0.0000</td>
</tr>
<tr>
<td>r=2</td>
<td>0.591045</td>
<td>23.24791*</td>
<td>21.13162</td>
<td>0.0248</td>
<td>46.74257*</td>
<td>29.79707</td>
<td>0.0002</td>
</tr>
<tr>
<td>r=3</td>
<td>0.544899</td>
<td>20.46813*</td>
<td>14.26460</td>
<td>0.0046</td>
<td>23.49466*</td>
<td>15.49471</td>
<td>0.0025</td>
</tr>
<tr>
<td>r=4</td>
<td>0.109885</td>
<td>3.026533</td>
<td>3.841466</td>
<td>0.0819</td>
<td>3.026533</td>
<td>3.841466</td>
<td>0.0819</td>
</tr>
</tbody>
</table>

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

### Table 4.18: Cointegrating Equations Based on the Normalized Cointegrating Coefficients

<table>
<thead>
<tr>
<th>Number of Integrating Equations</th>
<th>Log Likelihood</th>
<th>Dependent Variable of Interest</th>
<th>Growth rate of industry’s share of real GDP</th>
<th>Growth rate of real total external debt stock</th>
<th>Growth rate of real long term external debt stock</th>
<th>Growth rate of real short term external debt stock</th>
<th>Growth rate of total debt servicing as a percentage of exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>145.448</td>
<td>Growth rate of industry’s share of real GDP</td>
<td>1.000</td>
<td>0.107</td>
<td>-0.024</td>
<td>-0.054</td>
<td>0.148</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.140)</td>
<td>(0.129)</td>
<td>(0.015)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>2</td>
<td>166.150</td>
<td>Growth rate of industry’s share of real GDP</td>
<td>1.000</td>
<td>0.000</td>
<td>0.378</td>
<td>-0.177</td>
<td>0.240</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.052)</td>
<td>(0.045)</td>
<td>(0.074)</td>
</tr>
<tr>
<td>3</td>
<td>177.774</td>
<td>Growth rate of industry’s share of real GDP</td>
<td>1.000</td>
<td>0.000</td>
<td>0.000</td>
<td>-0.046</td>
<td>0.295</td>
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<td></td>
<td></td>
<td>(0.016)</td>
<td>(0.043)</td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses are standard errors
Table 4.19 Results of Johansen Cointegration Rank Tests

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Eigenvalue</th>
<th>Maximum Eigenvalue</th>
<th>Probability</th>
<th>Trace Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0</td>
<td>0.931192</td>
<td>69.58730</td>
<td>0.0000</td>
<td>137.9502</td>
<td>0.0000</td>
</tr>
<tr>
<td>r=1</td>
<td>0.806655</td>
<td>42.72580</td>
<td>0.0003</td>
<td>68.36295</td>
<td>0.0002</td>
</tr>
<tr>
<td>r=2</td>
<td>0.531236</td>
<td>19.69906</td>
<td>0.0783</td>
<td>25.63765</td>
<td>0.1399</td>
</tr>
<tr>
<td>r=3</td>
<td>0.195608</td>
<td>5.66137</td>
<td>0.6570</td>
<td>5.93830</td>
<td>0.7028</td>
</tr>
<tr>
<td>r=4</td>
<td>0.010607</td>
<td>0.277263</td>
<td>0.5985</td>
<td>0.277263</td>
<td>0.5985</td>
</tr>
</tbody>
</table>

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4.20 Cointegrating Equations Based on the Normalized Cointegrating Coefficients

<table>
<thead>
<tr>
<th>Number of Co-integrating Equations</th>
<th>Log Likelihood</th>
<th>Dependent Variable of Interest</th>
<th>Growth rate of the services’ share of real GDP</th>
<th>Growth rate of real total external debt stock</th>
<th>Growth rate of real long-term external debt stock</th>
<th>Growth rate of real short-term external debt stock</th>
<th>Growth rate of total debt servicing as a percentage of exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>167.515</td>
<td>Growth rate of the services’ share of real GDP</td>
<td>1.000 (-0.063 (0.114))</td>
<td>0.120 (0.104)</td>
<td>-0.023 (0.012)</td>
<td>-0.036 (0.013)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>188.878</td>
<td>Growth rate of the services’ share of real GDP</td>
<td>1.000 (0.00)</td>
<td>0.047 (0.008)</td>
<td>-0.019 (0.007)</td>
<td>-0.051 (0.011)</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Figures in parentheses are standard errors
Chapter 5

Vector autoregressive impulse responses of the growth rates of real GDP and sectoral real GDP shares

5.1 Introduction

This chapter extends the empirical literature on Pakistan’s external debt crisis by estimating real GDP Growth VAR Model, Agriculture’s Real GDP Share Growth VAR Model, Industry’s Real GDP Share Growth VAR Model, and Services’ Real GDP Share Growth VAR Model and using the VAR impulse responses of the growth rates of real GDP and sectoral real GDP shares for analysing the effects of external debt shocks on the growth rates of real GDP, agriculture’s share of GDP, industry’s share of GDP, and the services’ share of GDP. This new empirical VAR analysis is expected to inspire further empirical research on the subject in the case of availability of a larger data set for an extended period of time, which can eventually help develop a better understanding of the nature and the transmission mechanism of the short-run and long-run effects of shocks of Pakistan’s external debt policy on the growth rates of her real GDP and sectoral real GDP shares.

This chapter uses the vector autoregressive (VAR) analysis of real GDP growth model and sectoral GDP shares’ growth models as the aim is to investigate the nature of the dynamic causal relationships between the pairs of the endogenous stationary growth time series (for example, the growth rates of real GDP and real total external
debt stock) while taking account of their dynamic properties, interdependences, and interactions by means of VAR models [(Sims, 1980), (Hill, Griffiths and Lim, 2008)]. The analysis follows the original VAR approach of Sims (1980) using the specifications of the vector autoregressive equations in which each variable is specified as a function of its own lagged values and the lagged values of all other endogenous variables (Fair, 1991, p. 199). As in Chapter 4, the above empirical VAR analysis is extended to the growth rates of real GDP shares in the agriculture, industry, and the services sectors, respectively, in sectoral real GDP share growth VAR Models 2, 3, and 4. VAR models have been used to examine the dynamic interdependence of economic variables and explain the transmission of shocks among the endogenous variables.

The empirical econometric literature has employed VAR models as a useful econometric technique. For example, VAR impulse responses were applied by macroeconometricians for determining the growth effects of oil price shocks (Hill, Griffiths and Lim, 2008, p. 352). In the present study, VAR impulse responses are being applied for analysing the effects of the external debt shocks and their various long and short-run components on the growth rates of real GDP, agriculture’s real GDP share, industry’s real GDP share, and the services’ real GDP share.

This chapter estimates one aggregate-level and three sector-level unrestricted VAR models (respectively, Real GDP Growth VAR Model 1, Agriculture’s Real GDP Share Growth VAR Model 2, Industry’s Real GDP Share Growth VAR Model 3, and Services’ Real GDP Share Growth VAR Model 4). These four VAR models and the VAR impulse responses of the growth rates of real GDP and sectoral real GDP shares
to both their own shocks, and to the individual shocks of the above four external debt growth rates are discussed in order to capture the qualitative features of the VAR models (Adebiyi and Adeyemi, 2008). The stationarity of all the time series used in the four VAR models ensures the reliability of the estimation results of the VAR model and its impulse response functions (Adebiyi and Adeyemi, 2008).

5.2.1 VAR analysis: Real GDP Growth VAR Model 1

While following the VAR modelling approach of Hill, Griffiths and Lim (2008), this section presents empirical analysis of an unrestricted five-variable Real GDP Growth VAR Model 1 using stationary time series of the growth rates of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports 248 (Hill, Griffiths and Lim, 2008, p. 347). On the basis of four VAR Selection Criteria, namely, Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), and Hannan-Quinn information criterion (H-QIC), three is selected as the optimum lag length, as shown in Table 5.1 in the appendix to this chapter. Here it is also relevant to note that AIC is a widely-used information criterion. Following the arguments of Stock and Watson (2011), three as the selected optimum lag length is logically preferred to zero 249 as the alternative optimal lag length, which is selected on the basis of the Schwarz Information Criterion (SIC), which is also known as Bayesian Information Criterion (BIC), as shown in Table 5.1 in the appendix. Therefore, an

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248 Stationarity of these five growth time series has already been determined by the results of the unit root tests for nonstationarity in the form of the Phillips-Peron test statistics, as presented in Table 3.3 in the appendix to Chapter 3.

249 An optimum lag length of zero precludes the possibility of having a VAR system for estimation.
unrestricted Real GDP Growth VAR Model 1 was estimated using three lags for each variable.

VAR coefficients are rarely reported partly, which is partly due to their poor estimation and partly due to the troublesome process of presenting all the VAR coefficients (Canova, 2007). Therefore, VAR analysis usually reports the more precisely estimated functions (for example, VAR impulse response functions) of the VAR coefficients because these functions are judged to have more economic meaning (Canova, 2007).

On the basis of the estimation results of Real GDP Growth VAR Model 1, an analysis of impulse response functions for Real GDP Growth VAR Model 1 is presented in the next subsection, as the impulse response functions are the centrepiece of VAR analysis (Gujrati, 2003, p. 854).

5.2.1.1 Impulse response functions’ analysis of Real GDP Growth VAR Model 1

For exploring the dynamic structure of Real GDP Growth VAR Model 1, this subsection presents VAR analysis of impulse response functions. Figure 5.1 in the appendix to this chapter portrays twenty-five responses to Cholesky one-standard deviation innovations for the above Real GDP Growth VAR Model 1.

Impulse response functions for Real GDP Growth VAR Model 1 illustrate the nature of the dynamic responses of the real GDP growth and the above four external debt growth variables to their respective own shocks, and to the shocks of their other

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250 Impulse response functions portray the moving average of the system and, thereby, depict the nature of the response of the dependent variable to shocks in the error term.
determinants. Technically, the impulse response functions are graphs depicting the reactions of each variable’s present and future values to a temporary unexpected unit increment in the present value of any one of the error terms of a VAR system. Each impulse response function is graphed within the 95% confidence interval (Stock and Watson, 2001).

Here only the responses of the growth rate of real GDP to its own shock as well as to the shocks in the above four external debt growth variables are being highlighted. In Figure 5.1, the five figures in the first row illustrate the responses of the growth rate of real GDP, respectively, to Cholesky one-standard deviation positive shocks to the current growth rates of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports over a time period of ten years. The first figure in the first row reflects the temporary significant large positive response of the growth rate of real GDP to its own positive shocks, which then subsides and ultimately becomes zero in the short-run with about a one-year lag. In other words, innovations to the growth rate of real GDP temporarily increase the growth rate of real GDP but only in the short-run. The second, third, fourth and fifth figures in the first row reflect neither significant positive nor significant negative responses of the growth rate of real GDP, respectively, to the individual shocks of unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports. In other words, the individual innovations to the four external debt growth variables have neither positive nor negative effects on the growth rate of real GDP.
5.2.2 VAR analysis: Agriculture’s Real GDP Share Growth VAR Model 2

This analysis of Agriculture’s Real GDP Share Growth VAR Model 2 explores the nature of causal dynamic relationships between the pairs of stationary time series of the growth rates of agriculture’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports\(^{251}\) (Hill, Griffiths and Lim, 2008, p. 347). On the basis of two VAR Selection Criteria, namely, Likelihood Ratio (LR) and Akaike Information Criterion (AIC), three is the selected optimum lag length, as shown in Table 5.2 in the appendix, and is logically preferred to zero as the alternative optimal lag length, which is selected on the basis of three alternative information criteria (Final Prediction Error, Schwarz Information Criterion, and Hannan-Quinn Information Criterion), as shown in Table 5.2 in the appendix. Therefore, an unrestricted Agriculture’s Real GDP Share Growth VAR Model 2 was estimated using three lags for each variable.

On the basis of the estimation results of Agriculture’s Real GDP Share Growth VAR Model 2, an analysis of impulse response functions for Agriculture’s Real GDP Share Growth VAR Model 2 is presented in the next subsection.

\(^{251}\) Stationarity of these five growth time series has already been determined by the results of the unit root tests for nonstationarity in the form of the Phillips-Peron test statistics, as presented in Table 3.3 in the appendix to Chapter 3.
5.2.2.1 Impulse response functions’ analysis of Agriculture’s Real GDP Share Growth VAR Model 2

For exploring the dynamic structure of Agriculture’s Real GDP Share Growth VAR Model 2, this subsection presents VAR analysis of impulse response functions. Figure 5.2 in the appendix portrays twenty-five responses to Cholesky one-standard deviation innovations for Agriculture’s Real GDP Share Growth VAR Model 2.

Impulse response functions for Agriculture’s Real GDP Share Growth VAR Model 2 illustrate the nature of the dynamic responses of the growth rates of agriculture’s share of real GDP and four external debt growth variables to their respective own shocks, and to the shocks of their other determinants. In Figure 5.2, the five figures in the first row illustrate the responses of the growth rate of agriculture’s share of real GDP, respectively, to Cholesky one-standard deviation positive shocks to the current growth rates of agriculture’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports over a time period of ten years. The first figure in the first row reflects the temporary significant large positive response of the growth rate of agriculture’s share of real GDP to its own positive shocks, which then subsides and ultimately becomes zero in the short-run with about a one-year lag. In other words, innovations to the growth rate of agriculture’s share of real GDP temporarily increase the growth rate of agriculture’s share of real GDP but only in the short-run. The second, third, fourth and fifth figures in the first row reflect neither significant positive nor significant negative responses of the growth rate of agriculture’s share of real GDP, respectively, to the individual shocks of unexpected increases in the
current growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports. In other words, the individual innovations to the four external debt growth variables have neither positive nor negative effects on the growth rate of agriculture’s share of real GDP.

5.2.3 VAR analysis: Industry’s Real GDP Share Growth VAR Model 3

This analysis of Industry’s Real GDP Share Growth VAR Model 3 explores the nature of causal dynamic relationships between the pairs of stationary time series of the growth rates of industry’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports\(^{252}\) (Hill, Griffiths and Lim, 2008, p. 347). On the basis of four VAR Selection Criteria [namely, Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), and Hannan-Quinn Information Criterion (H-QIC)], three is the selected optimum lag length, as shown in Table 5.3 of the appendix. Therefore, an unrestricted Industry’s Real GDP Share Growth VAR Model 3 was estimated using three lags for each variable.

On the basis of the estimation results of Industry’s Real GDP Share Growth VAR Model 3, an analysis of impulse response functions for Industry’s Real GDP Share Growth VAR Model 3 is presented in the next subsection.

\(^{252}\) Stationarity of these five growth time series has already been determined by the results of the unit root tests for nonstationarity in the form of the Phillips-Peron test statistics, as presented in Table 3.3 in the appendix to Chapter 3.
5.2.3.1 Impulse response functions’ analysis of Industry’s Real GDP Share Growth VAR Model 3

For exploring the dynamic structure of Industry’s Real GDP Share Growth VAR Model 3, this subsection presents a VAR analysis of impulse response functions. Figure 5.3 in the appendix portrays twenty-five responses to Cholesky one-standard deviation innovations for Industry’s Real GDP Share Growth VAR Model 3.

Impulse response functions for Industry’s Real GDP Share Growth VAR Model 3 illustrate the nature of the dynamic responses of the growth rates of industry’s share of real GDP and four external debt variables to their respective own shocks, and to the shocks of their other determinants. In Figure 5.3, the five figures in the first row illustrate the responses of the growth rate of industry’s share of real GDP, respectively, to Cholesky one-standard deviation positive shocks to the current growth rates of industry’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports over a time period of ten years. The first figure in the first row reflects the temporary significant small positive response of the growth rate of industry’s share of real GDP to its own positive shocks, which then subsides and ultimately becomes zero in the short-run with about a one-year lag. In other words, innovations to the growth rate of industry’s share of real GDP temporarily increase the growth rate of industry’s share of real GDP but only in the short-run. The second, third, fourth and fifth figures in the first row reflect neither significant positive nor significant negative responses of the growth rate of industry’s share of real GDP to respectively the individual shocks of unexpected increases in the current
growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports. In other words, the individual innovations to the four external debt growth variables have neither positive nor negative effects on the growth rate of industry's share of real GDP.

5.2.4 VAR analysis: Services’ Real GDP Share Growth VAR Model 4

This analysis of Services’ Real GDP Share Growth VAR Model 4 explores the nature of causal dynamic relationships between the pairs of stationary time series of the growth rates of the services’ share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports\(^{253}\) (Hill, Griffiths and Lim, 2008, p. 347). On the basis of one VAR Selection Criterion [namely, Akaike Information Criterion (AIC)], three is the selected optimum lag length, as shown in Table 5.4 of the appendix to this chapter, and is logically preferred to zero as the alternative optimal lag length, which is selected on the basis of four alternative information criteria [Likelihood Ratio (LR), Final Prediction Error (FPE), Schwarz Information Criterion (SIC), and Hannan-Quinn Information Criterion (H-QIC)], as shown in Table 5.4. Therefore, an unrestricted Services’ Real GDP Share Growth VAR Model 4 was estimated using three lags for each variable.

\(^{253}\) Stationarity of these five growth time series has already been determined by the results of the unit root tests for nonstationarity in the form of the Phillips-Peron test statistics, as presented in Table 3.3 in the appendix to Chapter 3.
On the basis of the estimation results of Services’ Real GDP Share Growth VAR Model 4, an analysis of impulse response functions for Services’ Real GDP Share Growth VAR Model 4 is presented in the next subsection.

5.2.4.1 Impulse response functions’ analysis of Services’ Real GDP Share Growth VAR Model 4

For exploring the dynamic structure of Services’ Real GDP Share Growth VAR Model 4, this subsection presents VAR analysis of impulse response functions. Figure 5.4 in the appendix portrays twenty-five responses to Cholesky one-standard deviation innovations for Services’ Real GDP Share Growth VAR Model 4.

Impulse response functions for Services’ Real GDP Share Growth VAR Model 4 illustrate the nature of the dynamic responses of the growth rates of the services’ share of real GDP and four external debt variables to their respective own shocks, and to the shocks of their other determinants. In Figure 5.4, the five figures in the first row illustrate the responses of the growth rate of services’ share of real GDP, respectively, to Cholesky one-standard deviation positive shocks to the current growth rates of the services’ share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports over a time period of ten years. The first figure in the first row reflects the temporary significant small positive response of the growth rate of the services’ share of real GDP to its own positive shock, which then subsides and ultimately becomes zero in the short-run with about a one-year lag. In other words, innovations to the growth rate of the services’ share of real GDP temporarily increase
the growth rate of the services’ share of real GDP but only in the short-run. The second, third, fourth and fifth figures in the first row reflect neither significant positive nor significant negative responses of the growth rate of the services’ share of real GDP, respectively, to the individual shocks of unexpected increases in the current growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports. In other words, the individual innovations to the four external debt growth variables have neither positive nor negative effects on the growth rate of the services’ share of real GDP.

5.3 Conclusions and policy recommendations

VAR impulse response functions have been claimed by the practitioners to make economic sense for interpreting the empirical results of VAR models. The aggregate-level VAR growth analysis was primarily concerned with measuring the effects of the growth rates of real total external debt stocks, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rate of real GDP. Real GDP Growth VAR Model 1, which takes into account the dynamic properties and interactions of the above five stationary time series, provided a reliable consistent mechanism of describing the five time series as well as examining dynamic causal relationships between the pairs of the time series by means of their impulse response functions.

The analysis of the impulse response functions of the growth rate of real GDP reflected neither the significant positive nor significant negative responses of the growth rate of real GDP, respectively, to the individual shocks of unexpected
increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports. Moreover, only temporary significant large positive responses of the growth rate of real GDP to its own positive shocks were observed. These responses reduced to zero in the short-run, thereby implying evidence of the inertia\textsuperscript{254} in the process of economic growth in the short-run. Hence, finally, it can be concluded from the empirical analysis of VAR Model 1 that the growth rate of real GDP was an inertial process in the short-run, and the individual shocks to four external debt growth variables were not significant determinants of the growth rate of real GDP within the dynamic framework of VAR Model 1.

At the sector-level, VAR analysis first focused on the explanation of the growth rate of agriculture’s share of real GDP in the framework of Agriculture’s Real GDP Share Growth VAR Model 2 for exploring the nature of the causal relationships between the pairs of stationary time series of the growth rates of agriculture’s share of real GDP, real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports. The impulse response functions of the growth rate of agriculture’s share of real GDP reflected neither significant positive nor significant negative responses of the growth rate of agriculture’s share of real GDP, respectively, to the individual shocks of unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports.

\textsuperscript{254} Inertia in the short-run means that own shocks to the growth rate of real GDP persist as well as positively affect the growth rate of real GDP but only in the short-run (Adebiyi and Adeemi, 2008).
exports. Moreover, only temporary significant large positive responses of the growth rate of agriculture’s share of real GDP to its own positive shocks were observed. These responses reduced to zero in the short-run. It can be concluded from the above empirical analysis of Agriculture’s Real GDP Share Growth VAR Model 2 that the individual shocks to four external debt growth variables were not significant determinants of the growth rate of agriculture’s share of real GDP in the dynamic framework of VAR Model 2, and that its own productivity shocks explained most of the variance of the growth in agriculture’s share of real GDP in the short-run within the dynamic framework of VAR Model 2.

Secondly, the sector-level VAR analysis focused on the explanation of the growth rate of industry’s share of real GDP in the framework of Industry’s Real GDP Share Growth VAR Model 3 for exploring the causal relationships between the pairs of stationary time series of the same above relevant growth rates. The impulse response functions of the growth rate of industry’s share of real GDP reflected neither significant positive nor significant negative responses of the growth rate of industry’s share of real GDP to respectively the individual shocks of unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as percentage of exports. Moreover, only temporary significant large positive responses of the growth rate of industry’s share of real GDP to its own positive shocks were observed in the short-run. These responses reduced to zero in the short-run. It can be concluded from the above empirical analysis of Industry’s Real GDP Share Growth VAR Model 3 that the individual shocks to four external debt growth variables were not significant
determinants of the growth rate of industry’s share of real GDP in the dynamic framework of the VAR Model 3. In fact, its own productivity shocks explained most of the variance of the growth in industry’s share of real GDP in the short-run within the dynamic framework of the VAR Model 3.

Finally, the sector-level VAR analysis focused on the explanation of the growth rate of the services’ share of real GDP in the framework of Services’ Real GDP Share Growth VAR Model 4 for exploring the causal relationships between the pairs of stationary time series of the same above relevant growth rates. The impulse response functions of the growth rate of the services’ share of real GDP reflected neither significant positive nor significant negative responses of the growth rate of the services’ share of real GDP, respectively, to the individual shocks of unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total debt servicing as a percentage of exports. Moreover, only temporary significant large positive responses of the growth rate of the services’ share of real GDP to its own positive shocks were observed. These responses reduced to zero in the short-run. It can be concluded from the above empirical analysis of Services’ Real GDP Share Growth VAR Model 4 that the individual shocks to four external debt growth variables were not significant determinants of the growth rate of the services’ share of real GDP in the dynamic framework of VAR Model 4. Its own productivity shocks explained most of the variance of the growth rate of the services’ share of real GDP in the short-run within the dynamic framework of VAR Model 4. In short, there is empirical evidence of a significant positive response of a variable of our interest (the growth rates of real
GDP and sectoral real GDP shares) to only its own shock and this positive response becomes reduced to zero after the very first year.

It is pertinent to note that in sharp contrast to the determination of short-run and long-run effects of the external debt growth variables on the growth rates of real GDP and the sectoral real GDP shares of agriculture/industry/services in the framework of static models, the above empirical analysis of the VAR growth models, in which all variables are simultaneously and endogenously determined, and VAR impulse response functions explored and analysed the causal relationship between pairs of the above growth time series and determined their mutual short-run and long-run effects in the framework of dynamic VAR models, which inherently take into account the dynamic properties as well as the interactions of the above growth time series (Hill, Griffiths and Lim, 2008).

In spite of the obvious similarity of the above static empirical analytical frameworks of chapters 3 & 4 and the dynamic empirical analytical framework of VAR models in terms of involving short-run and long-run effects, there were found neither significant short-run nor significant long-run effects of the growth rates of the external debt growth variables on the growth rates of real GDP and the growth rates of real GDP shares of agriculture, industry, and the services in the empirical analyses of VAR impulse response functions. These empirical results depicted by the above VAR impulse response functions are in sharp contrast to the former empirical analyses of the static models, which showed significant short-run as well as significant long-run growth effects of certain external debt growth variables (for example, the empirical evidence of robust positive short-run and long run effects of
the growth rate of real long-term external debt stock and robust significant negative short-run and long-run effects of the growth rate of the growth rate of total debt servicing as a percentage of exports).

In conclusion, the above empirical analyses of VAR impulse response functions have provided an additional important insight into the dynamic processes of the real GDP growth and the three sectoral GDP shares’ growth that the real GDP growth and the growth in the individual real GDP shares of agriculture, industry, and the services are inertial phenomena in Pakistan only and only in the short-run. Against the background of the chronic economic inefficiencies and production losses caused by the endemic financial corruption and the prolonged crises of acute shortages of power (electricity) and water in Pakistan since the 1990s, this insight leads to a short-run policy recommendation for the Government of Pakistan that Pakistan can accelerate the growth rates of real GDP and three sectoral GDP share at least in the short run by introducing positive productivity growth shocks in her economic system by means of both the above systemic macroeconomic reforms-oriented anticorruption fiscal discipline and the proactive development policies of ensuring the requisite private and public investment in power generation, construction of new large dams and efficient irrigation networks, economic infrastructure, and human resource development by activating backward and forward inter-sectoral linkages.
Appendix to chapter 5

Table 5.1: VAR Lag Order Selection Criteria for the Five-Variable VAR Model 1\(^a\)

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR(^b)</th>
<th>FPE(^c)</th>
<th>AIC(^d)</th>
<th>SIC(^e)</th>
<th>HQ(^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>62.23</td>
<td>NA</td>
<td>8.43e-09</td>
<td>-4.40</td>
<td>-4.16*</td>
<td>-4.33</td>
</tr>
<tr>
<td>1</td>
<td>77.30</td>
<td>23.19</td>
<td>1.89e-08</td>
<td>-2.19</td>
<td>-3.22</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>104.61</td>
<td>31.51</td>
<td>2.01e-08</td>
<td>-1.16</td>
<td>-3.05</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>157.03</td>
<td>40.33*</td>
<td>5.10e-09*</td>
<td>-2.056</td>
<td>-4.81*</td>
<td></td>
</tr>
</tbody>
</table>

Notes: \(a\); VAR Model 1 consists of the growth rates of real GDP, real total external debt stocks, real long term external debt stock, real short term external debt stock, and total external debt servicing as percentage of exports, \(b\); LR indicates the sequential modified Likelihood Ratio (LR) statistic (each test at 5% level), \(c\); FPE indicates final prediction error, \(d\); AIC indicates Akaike information criterion, \(e\); SIC Schwarz information criterion, \(f\); HQ indicates Hannan-Quinn information criterion, * indicates lag order selected by the criterion.

Table 5.2: VAR Lag Order Selection Criteria for Five-Variable VAR Model 2\(^a\)

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR(^b)</th>
<th>FPE(^c)</th>
<th>AIC(^d)</th>
<th>SIC(^e)</th>
<th>HQ(^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>79.38</td>
<td>NA</td>
<td>2.25e-09*</td>
<td>-5.72</td>
<td>-5.48*</td>
<td>-5.65*</td>
</tr>
<tr>
<td>1</td>
<td>90.57</td>
<td>17.22</td>
<td>6.80e-09</td>
<td>-4.66</td>
<td>-3.21</td>
<td>-4.24</td>
</tr>
<tr>
<td>2</td>
<td>108.06</td>
<td>20.18</td>
<td>1.54e-08</td>
<td>-4.08</td>
<td>-1.42</td>
<td>-3.32</td>
</tr>
<tr>
<td>3</td>
<td>162.47</td>
<td>41.86*</td>
<td>3.36e-09*</td>
<td>-2.47</td>
<td>-5.23</td>
<td></td>
</tr>
</tbody>
</table>

Notes: \(a\); VAR Model 2 consists of the growth rates of agriculture’s share of GDP, real total external debt stock, real long term external debt stock, real short term external debt stock, and total external debt servicing as percentage of exports, \(b\); LR indicates the sequential modified Likelihood Ratio (LR) statistic (each test at 5% level), \(c\); FPE indicates final prediction error, \(d\); AIC indicates Akaike information criterion, \(e\); SIC Schwarz information criterion, \(f\); HQ indicates Hannan-Quinn information criterion, * indicates lag order selected by the criterion.

Table 5.3: VAR Lag Order Selection Criteria for Five-Variable VAR Model 3\(^a\)

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR(^b)</th>
<th>FPE(^c)</th>
<th>AIC(^d)</th>
<th>SIC(^e)</th>
<th>HQ(^f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>77.02</td>
<td>NA</td>
<td>2.70e-09</td>
<td>-5.54</td>
<td>-5.30*</td>
<td>-5.47</td>
</tr>
<tr>
<td>1</td>
<td>93.14</td>
<td>24.80</td>
<td>5.58e-09</td>
<td>-4.86</td>
<td>-3.41</td>
<td>-4.44</td>
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<tr>
<td>2</td>
<td>117.87</td>
<td>28.53</td>
<td>7.25e-09</td>
<td>-4.84</td>
<td>-2.18</td>
<td>-4.07</td>
</tr>
<tr>
<td>3</td>
<td>177.78</td>
<td>46.09*</td>
<td>1.03e-09*</td>
<td>-7.52*</td>
<td>-3.65</td>
<td>-6.41*</td>
</tr>
</tbody>
</table>

Notes: \(a\); VAR Model 3 consists of the growth rates of industry’s share of GDP, real total external debt stock, real long term external debt stock, real short term external debt stock, and total external debt servicing as percentage of exports, \(b\); LR indicates the sequential modified Likelihood Ratio (LR) statistic (each test at 5% level), \(c\); FPE indicates final prediction error, \(d\); AIC indicates Akaike information criterion, \(e\); SIC Schwarz information criterion, \(f\); HQ indicates Hannan-Quinn information criterion, * indicates lag order selected by the criterion.
Table 5.4 VAR Lag Order Selection Criteria for the Five-Variable VAR Model 4

<table>
<thead>
<tr>
<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SIC</th>
<th>HQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>98.41</td>
<td>NA*</td>
<td>5.21e-10*</td>
<td>-7.19</td>
<td>-6.94*</td>
<td>-7.12*</td>
</tr>
<tr>
<td>1</td>
<td>114.50</td>
<td>24.76</td>
<td>1.08e-09</td>
<td>-6.50</td>
<td>-5.05</td>
<td>-6.08</td>
</tr>
<tr>
<td>2</td>
<td>143.25</td>
<td>33.17</td>
<td>1.03e-09</td>
<td>-6.79</td>
<td>-4.13</td>
<td>-6.02</td>
</tr>
<tr>
<td>3</td>
<td>182.22</td>
<td>29.98</td>
<td>7.35e-10</td>
<td>-7.86*</td>
<td>-3.99</td>
<td>-6.75</td>
</tr>
</tbody>
</table>

Notes: a; VAR Model 4 consists of the growth rates of services’ share of GDP, real total external debt stock, real long term external debt stock, real short term external debt stock, and total external debt servicing as percentage of exports, b; LR indicates the sequential modified Likelihood Ratio (LR) statistic (each test at 5% level), c; FPE indicates final prediction error, d; AIC indicates Akaike information criterion, e; SIC Schwarz information criterion, f; HQ indicates Hannan-Quinn information criterion, * indicates lag order selected by the criterion.
Figure 5.1 Impulse Responses in Case of Real GDP Growth VAR Model

Response to Cholesky One S.D. Innovations ± 2 S.E.
Figure 5.2 Impulse Responses in Case of Agriculture’s Real GDP Share Growth VAR Model 2

Response to Cholesky One S.D. Innovations ± 2 S.E.
Figure 5.3 Impulse Responses in Case of Industry’s Real GDP Share Growth VAR Model 3

Response to Cholesky One S.D. Innovations ± 2 S.E.
Figure 5.4 Impulse Responses in Case of the Services' Real GDP Share Growth VAR Model 4

Response to Cholesky One S.D. Innovations ± 2 S.E.
Chapter 6

Conclusions

A new wave of recent external debt crises of especially the European countries has slowed down national and global economies via the phenomenon of external debt overhang and their complete recovery is still problematic in spite of numerous national, regional, and global institutional remedial policy responses. Because of the highly internationally integrated structures of contemporary national economies in the institutional framework of economic-cum-financial globalization, the contemporary external debt crises have triggered profound national, regional and global recessions, which are unprecedented in the modern history of numerous national external debt crises since the nineteenth century. Earlier, like several other developing countries, Pakistan’s economy was also hit by her 1998 external debt crisis – a culmination of the process of fast accumulation of external debt of Pakistan since the 1980s.

In contrast to the contemporary overwhelming global focus on the recent external debt crisis of certain European countries, Pakistan’s ongoing external debt crisis has not received as much global attention. Because of lack of substantial empirical research on the external debt crisis of Pakistan, this thesis focused on the empirical determination of the economic effects of the external debt crisis for Pakistan. In this context, this thesis presented a brief history of the Pakistan economy, a detailed literature review of the external debt crises in general and Pakistan’s external debt
crisis in particular, and an empirical econometric analysis of effects of accumulation of Pakistan’s external debt not only on her real GDP growth rate, but also on the growth rates of the real GDP shares of agriculture, industry, and the services using the World Bank data set for the period 1981-2010.

Chapter 1 briefly described the evolution of the economy of Pakistan during the late 1940s, the 1950s, the 1960s, the 1970s, the 1980s, the 1990s, and the 2000s. It highlighted the effects of Pakistan’s economic and external debt crises in the forms of fluctuating economic growth as well as poverty and rising inflation as well as unemployment. It identified the role of the manufacturing sector as the driver of economic growth and structural change in Pakistan’s economy. Keeping in mind the fact of the prevalence of an external debt/foreign aid-dependent macroeconomic growth regime in Pakistan, it uncovered the vulnerability of Pakistan’s economic growth especially to the shocks of the external debt burden in the form of growing total external debt servicing as a percentage of exports. It noted some improvement in the economic status of Pakistan from a low income developing country to a lower middle income developing country during the past sixty-five years of existence of Pakistan.

Chapter 2 surveyed the literature on Pakistan’s and other countries’ external debt crises. It highlighted a resemblance between Pakistan’s external debt crisis and the other countries’ external debt crises since the 19th century. It also uncovered a remarkable similarity in the official policy responses (for example, cut in public expenditures on health and education) of the governments of almost all the debt crisis-hit countries – irrespective of whether they are developing countries like
Pakistan or they are the developed countries such as the United Kingdom – to their respective debt crises. It highlighted the consensus of an overwhelming majority of Pakistani economists on the causes of Pakistan’s external debt crisis in the second half of the 1990s. It made it crystal clear that Pakistan’s chronic fiscal deficits in the wake of very low rates of national savings and balance of trade and balance of payments deficits triggered Pakistan’s external debt crisis. It found that the burden of the external debt servicing has been a hindrance to the growth of economy as the fluctuations in external debt have been causing fluctuations in the growth rate of economy in Pakistan. It highlighted the prospective solutions of the external debt crisis of Pakistan in the forms of actual achievement of significantly higher sustainable national saving and investment rates, sustainable budget surpluses, sustainable balance of trade and balance of payments surpluses, and implementation of effective austerity reforms.

Chapter 3 examined the real GDP growth effects of the external debt growth variables during the era of external debt accumulation since 1981. It used the unit root tests for nonstationarity, the method of Ordinary Least Squares (OLS), OLS residual diagnostics (Jarque and Bera Normality Test, Breusch and Godfrey Serial Correlation LM Test, Breusch, Pagan and Godfrey Heteroskedasticity Test, and Heteroskedasticity Test for ARCH Effects), stability diagnostics (Chow Breakpoint Test), and Johansen’s multiple cointegration tests for empirically determining the short-run and long-run effects of the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt stock, and total debt servicing as a percentage of exports on the growth rate of real
GDP using control variables. In addition, the OLS-based double-log regression models of the dependent variable real GDP and the explanatory external debt variables were also estimated for determining the elasticities of the real GDP with respect to the explanatory external debt variables. The empirical results confirmed the robustness of a significant positive real GDP growth effect of the growth rate of real long-term external debt stock and a negative real GDP growth effect of the growth rate of total debt servicing as a percentage of exports signifying external debt overhang in both short-run and long-run. In general, overall empirical results of short-run real GDP growth model were robust to the inclusion of two additional control variables, the growth rate of total labour force and the first-differenced growth rate of real capital stock. This empirical evidence led to an important short-run policy recommendation that Government of Pakistan should ensure a corruption-free, merit-based efficient allocation of long-term external debt among all sectors of economy for realizing synergy among them for realizing the highest attainable growth rate of real GDP. A long-run policy recommendation based on the empirical evidence of the plausible significant positive short-run and long-run effects of the growth rate of real long-term total external debt on the growth rate of real GDP was that Government of Pakistan should accelerate the economic growth rate by simultaneously instituting a comprehensive fiscal austerity-oriented package of long-term fundamental fiscal, constitutional, and administrative reforms. On one hand, this reform package was recommended to be designed to impose constitutional ceilings on fiscal deficits/domestic debt/external debt for ensuring fiscal discipline and accountability of policy makers and policy executers, to increase the national
savings rate through fiscal incentives, and to institute a judicious and efficient policy mix of financing public expenditures by means of external debt finance and external equity finance. On the other hand, this reform package should reinforce the above short-run policy of promoting an equitable-cum-efficient allocation of real long-term total external debt stock among the prospective investors in both public and private sector investment projects. Because of the general tendency of Government of Pakistan to resort to fiscal deficits by incurring excessive amounts of external debt, Pakistan’s economy has become a black hole economy for external debt as there is lack of transparency in the processes of external debt-related decision making and the use of external debt. An alternative short-run policy implication of the external debt overhang caused by the Pakistan’s unsustainable burden of debt servicing is to radically reduce the external debt stock through comprehensive macroeconomic reforms. But the success of a short-run policy recommendation of external debt reduction is problematic. Therefore, on the basis of a comparison between the policy of accelerating real GDP growth by means of external debt stock, which inevitably involves the burden of debt servicing as well as the external debt overhang, and the policy of accelerating real GDP growth by means of increasing inflows of FDI, the policy of accelerating real GDP growth by increasing the inflows of FDI has a greater economic rationale.

Chapter 4 extended the analysis in Chapter 3 and the literature by estimating the relationships between the growth rates of sectoral shares of real GDP and the four external debt growth variables. There was found empirical evidence of the robust significant positive short-run effects of the growth rate of real total external debt
stock on the growth rate of agriculture’s share of real GDP in cases of both three and five control variables. This empirical evidence led to a policy recommendation of accelerating the growth rate of agriculture in the short-run by promoting not only an equitable-cum-efficient allocation of real total external debt stock external stock between the majority of the needy small agricultural farm owners and a minority of resourceful large farm owners but also the actual investment of the real total external debt stock by its beneficiaries. In addition, it is recommended for the Government of Pakistan to ensure the equitable access of all economic agents to credit for eliminating their liquidity constraints and, thereby, breaking the exploitative vicious circle of interlocking factor markets prevalent within the agriculture sector of Pakistan by simultaneously launching an official program of effective credit reforms (Todaro and Smith, 2009). Empirical evidence was found of the robust significant negative short-run effects of the growth rate of real long-term external debt stock on the growth rate of agriculture’s share of real GDP in cases of both three and five control variables. In contrast to no empirical evidence of any significant short-run effects of both the growth rates of real short-term debt stock and total debt servicing as a percentage of exports on the growth rate of agriculture’s share of real GDP, there was mixed empirical evidence of both the significant negative and positive long-run effects of the growth rates of real short-term external debt stock and total debt servicing as a percentage of exports on the growth rate of agriculture’s share of real GDP. In the selected short-run agriculture’s share of real GDP growth models, there was no evidence of any significant short-run effects of five control variables on the growth rate of agriculture’s share of real GDP. There was also empirical
evidence of a significant negative short-run effect of the growth rate of real total external debt stock on the growth rate of industry’s share of real GDP in the case of five control variables. Moreover, there was empirical evidence of a significant positive short-run effect of the growth rate of real long-term external debt stock on the growth rate of industry’s share of real GDP in the case of five control variables. However, there was empirical evidence of significant negative long-run effects of the growth rates of real long-term external debt stock and total debt servicing as a percentage of exports and a significant positive long-run effect of the growth rate of real short-term external debt stock on the growth rate of industry’s share of real GDP. Out of five control variables, there was evidence of only a significant positive short-run effect of the growth rate of real foreign direct investment net inflows on the growth rate of industry’s share of real GDP. This empirical evidence led to a policy recommendation of accelerating the growth rate of real foreign direct investment net inflows for ensuring growth in real GDP share of industry in Pakistan from the point of view of accelerating the pace of economic development-oriented structural change in Pakistan. There was also evidence of a significant negative long-run effect of the growth rate of real long-term external debt stock and significant positive long-run effects of the growth rates of real short-term external debt and total debt servicing as a percentage of exports on the rate of growth of the services’ share of real GDP. Moreover, there was evidence of a significant short-run positive effect of the growth rate of real workers’ remittances and compensation of employees received on the growth rate of the services’ share of real GDP. This empirical evidence led to a policy recommendation of accelerating the growth rate of real workers’ remittances
and compensation of employees received for ensuring growth in real GDP share of
the services in Pakistan from the point of view of accelerating the pace of economic
development-oriented structural change in Pakistan. The strength of this empirical
study was attributable to the use a comprehensive set of the pertinent four distinct
external debt time series as the main explanatory variables, along with a
comprehensive set of control variables for separately determining their short and
long-run effects on the growth rates of real GDP shares of the agriculture, industry,
and the services sectors of Pakistan’s economy over the past thirty years (1981-
2010). A limitation of this empirical study was the existence of a small number of
the significant effects of the four external debt growth variables on the growth rates
of the real GDP shares of the agriculture, industry, and the services in Pakistan. This
was mainly due to the absence of sufficient over-time variations in the above annual
sectoral GDP share growth time series against the background of a stagnating
developing country-specific characteristic of a very slow pace of annual change in
the sectoral composition of Pakistan’s economy.

Chapter 5 estimated four unrestricted Vector Autoregressive (VAR) models: Real
GDP Growth VAR Model 1, Agriculture’s Real GDP Share Growth VAR Model 2,
Industry’s Real GDP Share Growth VAR Model 3, and Services’ Real GDP Share
Growth VAR Model 4. It also analysed the VAR impulse responses of the growth
rates of real GDP and three sectoral GDP shares to their own respective shocks, and
to the individual shocks of the above four external debt growth variables. There were
significant large temporary positive responses of the growth rates of real GDP (in
VAR Model 1), agriculture’s real GDP share (in VAR Model 2), industry’s real GDP
share (in VAR Model 3), and the services’ real GDP share (in VAR Model 4), which subsided and ultimately became zero in the short-run, to respectively their own individual positive shocks. In contrast, the above impulse response functions reflected that there were neither significant positive nor significant negative responses of the growth rates of real GDP (in VAR Model 1), agriculture’s real GDP share (in VAR Model 2), industry’s real GDP share (in VAR Model 3), and the services’ real GDP share (in VAR Model 4), respectively, to the individual shocks of the unexpected increases in the growth rates of real total external debt stock, real long-term external debt stock, real short-term external debt, and total external debt servicing as percentage of exports. In short, there was found empirical evidence of a significant positive response of a variable of our interest (the growth rates of real GDP and sectoral real GDP shares) to only its own shock and this positive response became reduced to zero after the very first year. Against the background of the chronic economic inefficiencies and production losses caused by the endemic financial corruption and the prolonged crises of acute shortages of power (electricity) and water in Pakistan since the 1990s, this insight led to a short-run policy recommendation for the Government of Pakistan that Pakistan can accelerate the growth rates of real GDP and three sectoral GDP share at least in the short run by introducing positive productivity growth shocks in her economic system by means of both the above systemic macroeconomic reforms-oriented anticorruption fiscal discipline and the proactive development policies of ensuring the requisite private and public investment in power generation, construction of new large dams and
efficient irrigation networks, economic infrastructure, and human resource
development by activating backward and forward inter-sectoral linkages.

Finally, it can be concluded that the history of Pakistan’s economy, pertinent
literature review, and empirical evidence have confirmed that external debt, real
workers’ remittances and compensation of employees received, and real foreign
direct investment net inflows were significant determinants of Pakistan’s growth rate
of real GDP.
Bibliography


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