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The Sri Lankan Debt Crisis: Is there a way out?

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On the cover is a picture that I took in Jaffna Peninsula, Sri Lanka. This beautiful beach was once a high security zone, and this entire peninsula was cut off from the general population and travel here was severely restricted, due to intense fighting between Government forces and the LTTE (Liberation of Tamil Tigers Eelam). Access was made possible only after the end of the civil war, but security remains high with a naval base in close proximity to this beach. The picture highlights the rehabilitation process taking place and the tourism potential that Sri Lanka has, which is often what Sri Lanka is known for.

The Sri Lankan Debt Crisis: Is there a way out?

By

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Executive Summary

After the end of the three-decade old civil war in 2009, Sri Lanka underwent rapid development and economic expansion. The following post war years saw a surge in investments mostly in infrastructure, but all these investments came in the form of debt. While debt is used by almost all nations to expand their economy, undertaking such a high rate of investments, which did not reap many benefits for the government, in such a short time put strain on the Sri Lankan government to continue paying interest, almost leading them to default on their external loans. But this default was avoided by means of a bailout provided by the IMF under conditions such as instituting fiscal consolidation and a tightened monetary policy to reduce credit growth and inflation. While fiscal consolidation can reduce government expenditures, there are inherent risks involved in carrying this out in conjunction with a tightened monetary policy. Looking at Sri Lanka's current economic standing through different economic parameters also does not paint an optimistic picture. Sri Lanka's budget deficit, the total debt, and interest payments for the last 10 years has ballooned and similarly, the trade deficit has also increased during this period, since an increase in the Sri Lankan GDP per capita has resulted in an increase in imports while the rise in exports has not kept up, contributing to an increasing trade deficit. The export composition also showed that Sri Lanka's export market being reliant on agricultural goods (which is not an increasing returns activity in addition to being dependent on the weather) and labor-intensive textiles. Only a small proportion of its exports were from industrial products. Even among its imports, investment goods composed only a small portion of the total imports. Thus, these parameters showed that Sri Lanka's exports belonged to the low-quality index where specialization was in labor intensive industries.

Hence a strong export market is essential because it is through this process that countries earn foreign exchange that enable them to continue paying off their debts as well as ensuring there is balance of payments. Hence this current production structure hurts the Sri Lankan economy where its low-quality goods are subject to more competition. Hence our objective and primary research question is to provide recommendations to policymakers on how to prevent future debt crises by improving their current economic policies under the current constraints and by showing how greater technology/manufacturing capabilities could contribute to a more sustainable GDP growth and how to transition into such an environment. To answer our research question, we turn to two models, the Balance-of-Payments (BoP) Constrained growth model and the Flying Goose Model (FGM), to identify whether there is a demand for Sri Lankan industrial goods and if so, how to bring about this structural transformation required.

The BoP constrained growth model developed by Anthony Thirlwall tries to estimate a growth rate that is maximized while ensuring balance of payments (exports=imports). This is given by the ratio of the product of the *income elasticity of demand for Sri Lankan exports* and the *world GDP per capita growth*, to the *Sri Lankan income elasticity of demand for imports*. The extension of this simplified model, the Multisectoral Thirlwall's Law (MTSL) growth rate, then extends this by incorporating the *weighted elasticities of the income elasticity of demand for exports and imports*. This is done by estimating the income elasticities of demand for exports and imports for various industry sectors that compromise the Sri Lankan economy's production structure and multiplying

this with the respective share of these sectors in the total exports and imports. Data analysis estimated the coefficients for the *income elasticity of demand for Sri Lankan exports* and *income elasticity of demand for imports* from which we estimated the MTSL growth rate using the extended model and the weighted coefficients. We find that Sri Lanka has high and significant coefficients for the industrial sectors of machinery, chemicals and other machinery, but a low share of these goods out of the total exports. This low share leads to a *low weighted income elasticity of demand for exports* which leads to a lower MTSL growth rate. What this MTSL growth rate indicates is the maximized growth rate at which there is BoP, taking into consideration the individual sectoral elasticities. We see that for the period from 1990-2016, the average MTSL growth rate was 0.89 percentage points lower than the actual growth rate, indicating that the only way the actual growth rate could have been sustained was by accumulating debt. Hence to increase this MTSL growth rate in order to grow fast without the need for additional debt, Sri Lanka needs a higher share of its exports to come from these high elasticity sectors, which will increase the *weighted income elasticity of demand for Sri Lankan exports* which in turn will increase the MTSL growth rate. Hence this requires structural transformation of the production structure in Sri Lanka.

The Flying Goose Model describes the rapid growth and structural transformation of East Asian countries to more capital-intensive sectors. The basic sequential pattern in the Flying Goose model showed how the development of Japanese industries began with the import of a new product from more advanced countries, followed by import-substituting production, and then finally advancing to exports of that product. East Asian countries initially specialized in labor intensive industries, like textiles, before migrating to more capital-intensive products through this process of development. The extensions of this model talk about the importance of diversification, rationalization and having a pro-trade oriented foreign direct investment. Non-parametric analysis was carried out on several parameters and compared with those of the East Asian and regional countries, such as the FDI per capita in Sri Lanka which was observed to have increased over a twenty-year period, and the trade dependence ratio which had declined during this same period, leading us to the conclusion that FDI wasn't necessarily in the pro-trade direction. The Revealed Comparative advantage (RCA) index for the various sectors, showed that Sri Lanka has a high RCA index for the textile industry, while a low RCA index for the Machinery and Chemical industries. Hence with this evidence, we could conclude that Sri Lanka was at the first stages of the FGM, with FDI not in the pro trade direction, which is required for upgrading into more capital-intensive industries. Sri Lanka also showed a high investment ratio, but the consequent drop in the trade dependence ratio and Sri Lanka's specialization and high revealed comparative advantage in labor intensive industries rather than in the machinery and chemicals sectors showed that these investments were not funneling into strategic industries.

Hence our policy recommendations go in the direction of building a comprehensive selective industrial policy, focusing on building up strategic industries which can help raise the MTSL growth rate through means of accelerating the flying goose model of development. These selective industrial policy recommendations aim to improve Sri Lanka's RCA index in these strategic sectors and increase trade flows through means of attracting more pro-trade oriented FDI. Some of the instruments that are recommended are those such as concessionary loans for strategic industries while maintaining a tightened monetary policy, the use of development banks to provide such loans, the promotion of national leaders, the introduction of policy standards through means of export quotas in exchange for subsidizes and building up capabilities through better education.

These recommendations make sure to take into consideration the current economic constraints as well. There are also limitations with such recommendations, the prominent ones being the question of state capacity of Sri Lanka and the rise of China.

The significance of this thesis towards the Management of Technology program lies in showing the positive impact that high technology has on income growth (GDP per capita) especially in developing countries like Sri Lanka, and how moving into such as environment can enable a developing country's income to grow rapidly while maintaining BoP and without accumulating debts. We see that industries such as machinery (which includes high technology manufacturing goods such as semiconductors and telecom equipment) and chemicals, which have a significant technology component, have *the highest income elasticities of demand* in Sri Lankan exports. We then observed that a greater share of these high elasticity technology goods can contribute to a *higher weighted income elasticity of demand* for Sri Lankan exports, which in turn can increase the MTSL growth rate. Another point of this thesis is to show that transitioning into such an environment where specialization is built in high technology manufacturing by firms can only take place in stages. There cannot be leap frogging in this area by a developing country directly into high technology manufacturing. The experience needed for this endeavor is steadily built up through manufacturing experience that goes from labor intensive industries to more capital intensive and high technology industries. What can be influenced is the timeline this is achieved, through means of selective industrial policy. The vast amount of literature shows that countries which transitioned from developing countries specializing in labor intensive industries to more capital intensive and high technology industries did this in stages and by accelerating these stages through means of targeted industrial policy.

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1. Introduction

Every country has some form of debt. This can be in the form of foreign debt, public debt or debt held by international banks. All countries raise money for various reasons, such as to invest in infrastructure projects, education, and defense etc. Countries also raise money in order to fund their current expenditures in running their governments. When tax revenues of the government fall short of their expenditures, governments usually end up borrowing to fund this differential. Projects usually require large investments, and since a country's finances are always fluctuating, they often borrow from other countries directly or from overseas institutions such as the World Bank, The Asian Development Bank etc. Another way to raise money is to issue sovereign bonds in US currencies or the local denomination. These bonds come in various types, but the most well-known ones are where governments pay a periodic interest rate and at the end of their maturity the full-face value of a bond is repaid. These bonds are usually bought by local public investors or foreign investors. Bonds and Treasury Bills (short term bonds that do not pay interest, but sold at a discount) are considered very safe investments since they are issued by sovereign countries and the probability of failure of payment are low.

A way to measure whether a country has too much debt and to enable comparison with other countries is to compare the total debt relative to its GDP (Gross Domestic Product), called the debt-to-GDP ratio. Another way is to compare the total debt relative to its exports, called the debt-to-exports ratio. Many papers postulate what counts as a high or critical debt-to-GDP ratio, beyond which it could be detrimental to the economy, but there isn't much consensus on this matter. A debt crisis materializes in many ways. One way is when a country is unable to pay the interest on the bonds investors hold. Another instance is when bonds reach maturity and the full-face value of the bond has to be repaid, and the govt. lacks the funds to do so. In these cases, the country will be in default. Examples of such defaults include Argentina's default in 1991 and then in 2001, the default of Mexico in 1982, etc. (Beker & Moro, 2016).

Defaulting on such loans can be disastrous, since it will affect future borrowings and restrict access to bond markets making it difficult to find buyers for future bonds and Treasury bills offered. This is because bonds are considered very safe and defaulting on them might cause investors to develop expectations that they are not safe as previously thought of. Hence in the event of such a crisis, it leads most countries to request a bailout to prevent a default and to continue paying interest payments. The severity of the default depends on who holds a large part of the debt. The Greek debt crisis was considered much more severe (the country had a debt-to-GDP ratio of 180%) since a large part of the debt was held by foreign investors, while the Japanese debt crisis doesn't draw the same attention (the country had a debt-to-GDP ratio of 240%) because most of the debt is held by the Japanese public (Matthews, 2015). The debt crisis which Sri Lanka has gotten into includes difficulty in paying interest rates which required a bailout by the IMF (International Monetary Fund) and paying the face value of their bonds valued at almost $7 billion in the next three years (Shepard, 2016) .

The ethnic conflict which exploded in the year 1983 had dampened economic activity in Sri Lanka, with significant expenditures on the military and low foreign direct investments. Following the end of the civil war on May 2009, Sri Lanka was primed for an economic revival. The government of Sri Lanka at the time undertook massive infrastructure development projects such as building a new international airport, a new sea port, new power plants, as well as building up war torn regions in the North with investments in highways and rail. These projects were all financed through external debts. With the change of governments in 2015, the current government is grappling with a debt crisis, with the government owing almost $65 billion to creditors. In addition, a lot of the government's revenues are going towards interest payments of previous accumulated debt (Shepard, 2016), with the IMF recently providing a bailout to prevent a bankruptcy.

With the current crisis, the present government and the opposition has engaged in a blame game as to who was responsible for the ongoing crisis. The new airport built by the previous government (the current opposition) has been termed the emptiest airport in the world, and it along with the new port has been dubbed "white elephant projects" (India takes on China at another battlefront: A Sri Lankan airport, 2017). The present government has blamed the previous one, of undertaking these projects without conducting a proper cost-benefit analysis. A recent news article even stated that the government is even unaware of the total debts that the country owes to its creditors (Shepard, 2016). Most of these debts were financed by China, to whom it owes almost $2.5billion. Adding to this crisis is that some of these debts reach maturity in the following year, while the country has only $9.9 billion in Central Bank assets (Central Bank of Sri Lanka, 2017).

Even though most of these accumulated debts were invested in infrastructure development, Sri Lanka did not reap benefits from these projects. In addition to this there is also a housing boom, with new apartments and luxury high rises coming up rapidly. This case can be seen similar to the Euro zone crisis. Prior to this crisis there was a massive construction boom in southern European countries (the periphery). This resulted in increased GDP growth, but also contributed to an increased domestic demand. This lead to massive financial inflows increasing the debt burden and contributing to a wider trade deficit spread (Storm & Naastepad, 2015). While debts are required by any sovereign country to expand its economy, inefficient allocation of such resources can lead to the kind of debt crisis Sri Lanka is facing today. Sri Lanka has been gradually facing trade deficits in the last few years, burdening foreign exchange reserves and adding to the debt burden (Central Bank of Sri Lanka, 2017).

Looking at most countries that are burdened by a debt crisis one can easily observe, these countries all share one thing in common, and that a major portion of their exports are low tech goods like agricultural goods and textiles (Japan is an outlier, since most of its debt is held by the Japanese public). Sri Lanka's largest exports are garments and tea, markets which often face stiff competition from other countries like China, India, Bangladesh and Kenya. Relying on the exports of low tech goods, which are affected by commodity prices, increases risks in exports. Hence a diversification of Sri Lanka's exports, incorporating high tech goods into their export portfolio is paramount to establishing a sustainable economy. In light of the debt crisis and the bailout provided by the IMF, the IMF has enforced strict policies, incorporating fiscal consolidation, where actions are taken to reduce government expenditures, which the Sri Lankan government has to follow to avail further cash inflows.

This research uses two primary models to understand which sectors have the highest potential for sustainable growth in Sri Lanka, and the steps necessary to bring about this change. The first model is the BoP constraint growth model developed by Anthony Thirlwall (1979) and its extensions, to identify the sectors which Sri Lanka should concentrate its efforts in to ensure sustainable growth. The second model is the Flying goose model (FGM) developed by Kaname Akamatsu during the 1930s, to understand the steps that were involved in the rapid transition of east Asian economies, the so called "Asian Miracle", and whether Sri Lanka's economy has the capabilities and resources, and if they do, then the steps necessary to be undertaken to cause a structural change with in the Sri Lankan economy by emulating the FGM. The theory and the methodology will be elaborated in the chapters to follow.

1.1 Research Design

1.1.1 Research Objective

While politics will always play a major role in policy making in Sri Lanka, and the current crisis was primarily created by political involvement, I will attempt to look at the problem from an economic perspective. ***The primary research objective is to provide recommendations and advice to the Sri Lankan government and policy makers on how to better prevent future debt crises by improving current economic policies as supported by the IMF, by showing how greater technology/manufacturing capabilities could contribute to a more sustainable GDP growth and how to transition into such an environment.*** The meaning of "sustainable" in the context of the objective refers to maintaining a rate of GDP growth without creating other significant economic problems such as running large sustained trade deficits. Hence ensuring sustainable growth without the burden of debts and BoP should be the outcome of this objective.

1.1.2 Research Framework

(a)   (b)   (c)
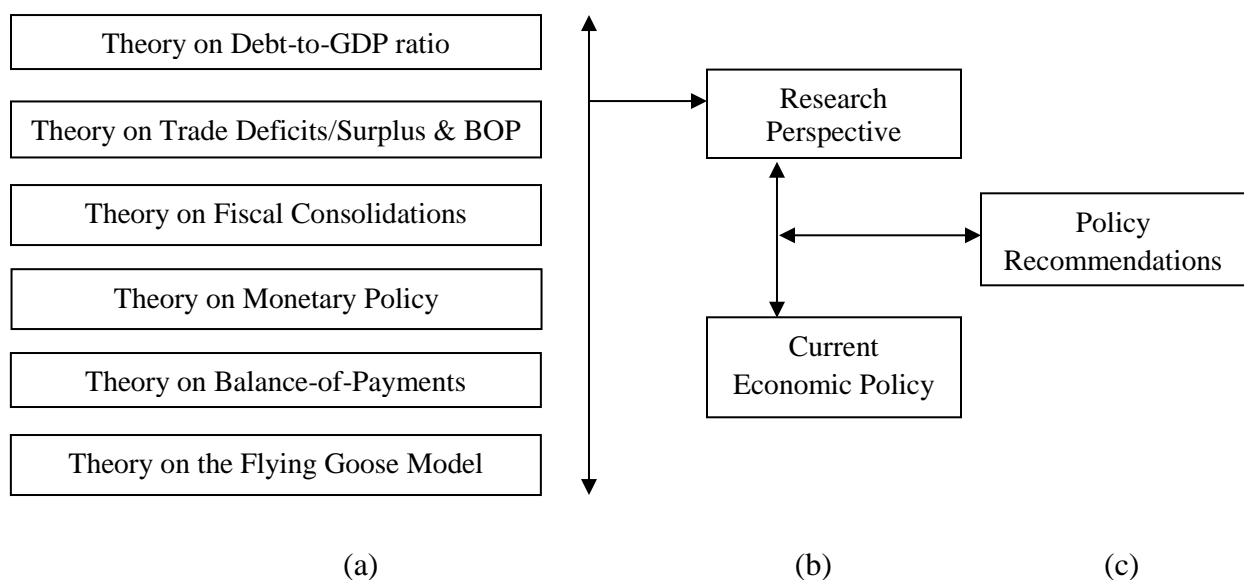
Figure 1: Research Framework. Adapted from "Designing a Research Project" by Verschuren, P., & Doorewaard, H. (2010), The Hague.

The final objective of the research is to arrive at policy recommendations. To achieve this, the framework to be followed is visualized above, as adopted from the book "Designing a Research Project" by Verschuren & Doorewaard (2010). The framework is divided into three parts. Part A involves reading up on literature related to the key concepts that compose my research perspective. Some other preliminary theories, other than the BoP constrained theory and the theory on the Flying Goose Model, that are relevant to the research objective and perspective are listed below:

1) **Theory of Debt-to-GDP Ratio:** As mentioned in the research objective above, to prevent a worsening of the crisis involves preventing a worsening of the Debt-to-GDP ratio of Sri Lanka. The equation of the debt-to-GDP ratio is given as follows.

Debt-to-GDP Ratio= Total Debts outstanding/ GDP

The debt-to-GDP ratio as mentioned in the introduction above gives an indication of the intensity of the debt burden. Hence an exacerbation of the crisis could be brought about by a reduction in GDP, through IMF induced policies, which would increase the debt-to-GDP ratio worsening the crisis. Many papers postulate sustainable levels of debt-to-GDP levels. Preliminary literature review is done and mentioned below, to understand what constitutes a sustainable level of debt-to-GDP ratio.

2) **Theory on Fiscal Consolidation:** Fiscal consolidation is carried out in order to reduce government deficits primarily through means of spending cuts. This includes reducing government expenditures and investments and increasing efficiency by reducing bloated public services through staff reduction. Relevant literature in this field as mentioned above argue for and against fiscal consolidation and the possible effect of this on Sri Lanka's economy is to be understood.

3) **Theory on Trade Deficits/Surplus & BOP:** As explained above in the problem description, trade deficits can be a huge burden on government finances. When trade deficits increase, there is often a net outflow of foreign reserves from the country. This puts pressure on a country's GDP growth and directly worsens the debt crisis by increasing the debt-to-GDP ratio, as well as reducing the ability to pay back sovereign bonds which are in foreign currency, due to a lack of them. Trade deficits/surplus are also related to the theory of the BoP constrained growth model developed by Anthony Thirlwall (1979). In essence this theory states the conditions under which a country can grow as fast as possible, ensuring balance of payments (balance of exports and imports). This theory is further elaborated in chapter 3. This theory forms one of the foundations of the research and is also used to calculate Sri Lanka's BoP growth rate and compare to its actual growth rate.

4) **Theory on Monetary Policy:** Monetary policy involves setting an appropriate interest rate, taking into account inflation and investments. As advocated by the IMF, Sri Lanka follows an inflation targeting interest rate policy. Inflation targeting refers to setting a target interest rate to ensure inflation is under control. A lower interest rate favors greater investment due to a lower cost of borrowing, and this investment can lead to higher wage growth, and greater employment (full employment), and if not properly monitored can lead to higher inflation as well. Hence central banks balance inflation and investment growth while setting interest rates, with a greater focus on managing inflation.

5) Theory on the Flying Goose Model (FGM): This theory explains the model of how east Asian countries such as Japan, Korea, and Taiwan underwent rapid economic growth through the cyclic process of imports, domestic production (import substitution) and finally exports with the help of FDI and a increased investments/GDP ratio. It also explains the influence of, and the importance of foreign direct investment (FDI) and diversification of the industry sectors (Kojima, 2000). More on this theory will be elaborated further in Chapter 5 after which a diagnosis of Sri Lanka's economic standing in the context of the FGM is carried out.

Part B relates to the research perspective. The research perspective is theory-based research, even though it relates to improving current policy making. The current policy recommended by the IMF is primarily based on theories on fiscal consolidation, monetary policy based on inflation targeting and specific benchmarks for debt-to-GDP ratios. The nature of my research perspective is a theory testing research. As mentioned under the Theory of Trade deficits/Surplus & BoP, the BOP model is tested for Sri Lanka's case. Diagnosis of Sri Lanka's economic standing in the context of the FGM is also carried out. Confrontation of the research perspective with the current policy will be done by the two models, testing the validity of the economic policies as recommended by the IMF and whether they are suitable to the unique case of Sri Lanka. The results from the empirical tests and non-parametric diagnosis and extensive literature review will then formulate the basis of the recommendations for policy advisers.

1.1.3 Research Questions

From that line of thinking, my primary research question here would be, ***"How can future debt crises be prevented in Sri Lanka, taking into consideration the current economic constraints, with the implementation of comprehensive macroeconomic policy recommendations, to ensure sustainable growth?"*** The focus here is the word "comprehensive" which unlike IMF policies, which focuses extensively on just fiscal consolidation and monetary policies, tries to build a macroeconomic framework inclusive of taking other sectors, such as investments in education, technology and industries, which can affect economic performance and contribute to sustainable growth. Sustainable in this context refers to a steady rate of growth without it being fueled by increased domestic demand and excessive debt and widening trade deficits. The IMF policies are analogous to a crutch which seems to help the country to limp away from a crisis till another crisis hits, requiring a new crutch. Policies should be taken up to not just prevent the present crisis but to prevent future pitfalls due to present repressive policies.

Secondary questions that complement the primary research question and that must be answered are,

1. How can Sri Lanka shift to a high technology economy to increase competition and what will be the impact on income growth?
The primary objective of this question is to investigate what impact high technology capabilities will have on the trade deficits and whether increased investments to improve high technology output will have an impact on income growth and to what extent, so as to shift Sri Lanka's orientation of exports from low tech goods to high tech and knowledge-based goods. The impact of these investments on reducing the trade deficits and on sustainable income growth will be researched.

2. What type of monetary policy should the Central Bank adopt in light of increasing credit growth?

The IMF has recommended tightening monetary policy which translates to increasing interest rates to curb inflation and credit growth. As mentioned above, increasing interest rates can cause a slowdown in growth by reducing private investments and private consumption (since this will increase savings by the general population). But given the rapid rise in credit growth in the last few years, it may be necessary to increase interest rates to prevent overheating of the economy, at the expense of moving away from full employment. This is a dilemma that must be further researched.

3. What will be the risks of carrying out fiscal consolidation as recommended by the IMF, and how can they be circumvented?

This question aims to investigate the risks of fiscal consolidation that Sri Lanka will need to implement in exchange for the bailout that Sri Lanka received in order to continue receiving future payments. Fiscal consolidation and tightening spending might reduce expenditures but might lead to dampening growth and worsening the debt-to-GDP ratio. A worsening of this ratio will lead to future borrowings to be at unfavorable interest rates. A similar case can be seen in Argentina where, following the debt crisis in 1991, Argentina instituted reforms recommended by the IMF. The country experienced on average 6% GDP growth but ended up with another debt crisis in 2001, defaulting on its sovereign bonds. The budget deficit continued increasing during this period and resulted in more funds flowing into the country irrespective of this deficit (Beker & Moro, 2016). Whether to follow IMF recommended policies or not would be part of the recommendations.

1.3 Initial Literature Review

Most of the literature review that I have so far gone through focuses on past debt crises. The first paper by Ghosh, Dhar, & Chakraborty (2008) focused on data gathered for a period of twenty-five years from 1975-2000. This paper builds a comprehensive model for the Sri Lankan economy for this time duration. This paper finds that even though the government's current purchases of goods and services never exceeded tax revenues, Sri Lanka always experienced budget deficits due to interest payments on past debts, which exacerbated the public debt of the economy. Since this paper looked at data from 1975-2000, it also highlights the ethnic conflict as a burden on the government. Since the conclusion of the ethnic conflict in 2008, the debt crisis has worsened due to undertaking large scale infrastructure projects, rather than decrease as result in the growth in the economy (Ghosh, Dhar, & Chakraborty, 2008).

There is also a current working paper by Fernando, Silva, Naranpanawa, & Gunasinghe (2017) which investigates the relationship between debt and growth, taking into consideration the current debt crisis. This paper finds a relationship between the quality of borrowing and economic growth. The paper states that even though the debt-to-GDP ratio of Sri Lanka is significantly lower (~76%) than most developed countries, Sri Lanka is not in a good condition due to the increase in proportion of non-project loans and borrowings from commercial sources in total debt composition. Non-project loans do not generate any income with which to repay loans, and commercial borrowings have severe conditions of debt servicing due to strict repayment

conditions, higher interest rates and short duration payments (Fernando, Silva, Naranpanawa, & Gunasinghe, 2017). The paper finds a highly significant and negative correlation of borrowing non-concessional loans and non-project loans on economic growth. It also finds a negative correlation between quantity of foreign debt and economic growth, and the paper also supports the theory on sustainable thresholds of debts (Fernando, Silva, Naranpanawa, & Gunasinghe, 2017).

The working paper by Reinhart & Rogoff (2010) argues the presence of a threshold of a debt ceiling after which additional debt burden can contribute to a reduction in GDP growth. The Reinhart & Rogoff (2010) state that a threshold of 90% debt-to-GDP ratio exists, above which median growth rates fall by 1%, while the relationship between government debt and GDP growth is weak below this level. The paper also states a lower threshold of external debt for emerging countries (60% debt-to-GDP ratio), above which growth rates decline by 2%. An article by Nutti (2013) states that, fiscal consolidation and austerity can often lead to worsening of the situation. Nutti (2013) argues in direct contradiction to Reinhart & Rogoff (2010), that causation runs backwards, that is slower growth leads to higher debt-to-GDP ratios.

The paper by Storm & Naastepad (2015) states a similar situation like Sri Lanka that southern European countries faced prior to the Euro zone crisis. The paper states that these countries faced strong domestic demand resulting in higher imports and negative trade balances. These countries also experienced a booming construction and tourism sector and due to higher returns on capital from these sectors, as well as lower interest rates, there was greater capital inflow into these countries due to lower cost of borrowing. This capital did not contribute in any way to building up of technological capabilities. The southern European countries specialize in low tech goods for which markets grow less rapidly, while countries like Germany specialize in high tech goods. This opens up competition in low tech markets from countries like China, whereas German firms operate in markets that are not served by China. The paper states that most Southern European firms exit a market when Chinese exporters push in, while German firms often do not exit and even sometimes push out Chinese firms (Storm & Naastepad, 2015).

In chapter 2 of the book Modern Financial Crises by Beker & Moro (2016), the Argentine debt crisis where it defaulted in 1991 & 2001 is elaborated. It questions the reasoning behind the defaults on how Argentina was able to borrow so heavily after its default in 1991, and then default again in 2001. Following the default of Mexico in 1982, many Latin American countries followed suit in defaulting on their loans including Argentina in 1991. Following this default, the govt. instituted sweeping economic reforms, liberalizing international trade and privatizing public utilities. The govt. also adopted IMF reforms and obtained funds from the IMF, including assistance in their fiscal, monetary and banking sectors. The IMF also widely praised the country in its effort to stabilize the economy through IMF reforms and the authors identify this implicit vote of confidence encouraged investors to once again pour capital in to the country even though it was running a fiscal deficit year after year (Beker & Moro, 2016).

The elaboration of the BoP constrained theory & the Theory of the Flying Goose model will be elaborated in Chapter 3 & 5 respectively.

1.4 Methodology

In order to draw recommendations to prevent future debt crises, I make use of data analysis (OLS regression) to empirically test out the extension of the BoP constrained growth model elaborated in chapter 3 to identify industries which have *high income elasticities of demand for exports and imports*, in order to understand the direction of diversification that Sri Lanka needs to undergo and calculate the multisectoral BoP constrained growth rate. I also make use of non-parametric analysis to diagnose Sri Lanka's economic structure in the context of the Flying Goose Model. The results of these two types of analysis will then enable the formulation of economic policy recommendations and that will enable the building up of a more sustainable growth model for Sri Lanka. *The unit of analysis* includes looking at the economic performance of Sri Lanka; hence the unit of analysis will be the economy of Sri Lanka. The data collection process is elaborated below and the data analysis that will be done will be elaborated further in chapter 4.

Since the research perspective that I have adopted is a theory testing approach, the primary purpose is to test the extended BOP constrained growth model for Sri Lanka's unique export and import composition and to diagnose Sri Lanka's economic structure in the context of the FGM. The type of research will be quantitative, hence statistical regression analysis will be done to find any significant correlations between the variables, and since there is more than one explanatory variable affecting the dependent variable, multiple regression is carried out. OLS (Ordinary Least Squares) is used to estimate the coefficients in order to know the value of the elasticities and help us answer the research questions. The regression will be done to find the strength of the relationship between the volume of export/imports and GDP per capita of the World/Sri Lanka and the real exchange rate and then calculate the BOP constrained growth rate. Since the analysis will involve looking at time series data (where the current value of a time series is based on its past values), the model will be tested for autocorrelation using the Durbin-Watson test as well, and the coefficients corrected for any autocorrelation. The results of the data analysis and the non-parametric analysis will be used to answer the secondary research questions. For research question 1, the flying goose model (FGM) is used to understand the transitionary steps Sri Lanka can use to diversify its economy, similar to that followed by the east Asian economies. Here non-parametric analysis is used to draw conclusions from studying trends and patterns of time series data.

1.5 Data Collection

Relevant Sri Lankan macroeconomic data will be collected from the Central Bank Annual Reports published by the Central Bank of Sri Lanka for the period from 1996-2017 (Central Bank of Sri Lanka, 2017) and World Development Indicators (WDI) published by the World Bank (World Bank Open Data). Secondary data was also collected from the IMF country review Reports. Time series data for total debts, foreign debts, project loans, non-project loans, government expenditures, university expenditures, trade deficits, total exports/imports, composition of exports by sector, private consumption and interest rates, and other macroeconomic indicators were collected from Central Bank Annual Reports as well as from WDI. Other data such as Research and development Expenditure as a % of GDP, High Technology Exports as a % of GDP, Patent Applications by Residents, Scientific and Technical Journal articles published, and private infrastructure investment, were collected from World Development Indicators. For the conceptual model, data

for some of the variables can be obtained directly from the data sheets. Data for GDP, government expenditure, trade deficits, the debt-to-GDP ratio and interest rates, can be directly obtained from Central Bank Annual Reports.

Proxies for the other variables have to be taken. IMF enforces fiscal consolidation through a reduction of government spending hence total government expenditure is taken as the proxy for consolidation. There are several proxies for high technology innovation. The paper by Oughton, Landabaso, & Morgan (2002) identifies government and firm level spending on R&D, and spending on education as determinants of innovative capabilities. The paper by Furmana, Porter, & Stern (2001) also identifies patents as a determinant of national innovative capacity. Hence based on the literature, proxies for high technology innovation are R&D expenditure as a % of GDP, spending in university education, number of patent applications and journal articles published. Data on high technology exports as % of GDP and ICT goods exports as a % of GDP is collected as well to understand the standing of Sri Lanka's technology capabilities. Data related to Foreign Direct Investment was collected from the website of the United Nations Conference on Trade & Development (UNCTAD). Data relevant to test the BoP constrained model was collected from the World Trade Organization (WTO) and the U.S. Bureau of Labor Statistics (BLS) and the collection of this data as well the assumptions made will be elaborated further in Chapter 4.

The data for all these variables have been scraped off the internet from the websites of the Central Bank of Sri Lanka, the World Bank, UNCTAD, WTO and the U.S. BLS, and is found in downloadable content. The secondary data must be studied for errors since there is a chance that for some variables, the different sources may give different values or there may be missing data for some timelines and hence corrections need to be done. The data also must be in the right format since, while the data from World Bank indicators are available in excel format, data from the Central Bank is only available in PDF. Hence the relevant data must be transformed to the right format before calculations are carried out and for use in statistical softwares such as SPSS.

The chapters that follow are organized in the following way. Chapter 2 gives a breakdown of Sri Lanka's current economic structure and standing followed by the second and third IMF reviews that were carried out. Chapter 3 elaborates on the BoP theory and its extension, the Multisectoral Thirlwall's Law (MTSL). Chapter 4 consists of the data analysis, in the context of the BoP constrained growth, carried out to estimate the World and Sri Lankan income elasticities of demand for exports and imports and then to finally estimate the Multisectoral Thirlwall's law growth rate which is then compared with the actual growth rate. Chapter 5 then elaborates on the flying goose model of development and diagnoses Sri Lanka's economy in the same. Chapter 6 summarizes all the arguments presented in the previous chapters, from which recommendations are drawn before finally concluding.

2. The Sri Lankan Economy and its Development

In this chapter, an overview of the Sri Lankan economy will be given with regards to certain economic parameters for the period between 2007 and 2016 to get an understanding of the economy on its current standing. The significance of this period, as mentioned in the introduction, is due to the fact that the civil war ended in 2010 after which came the rise in economic growth, development and the accumulation of debt in the following years. I will present a general overview of the country's macroeconomic performance- paying specific attention to growth, government debt and the BoP. What I find is that the Sri Lankan economy is import-dependent and BoP-constrained.

Then I will briefly review the IMF policies which focus on the short run. What Sri Lanka needs is a sustainable way out of the BoP constraint and this requires structural change – a diversification of output and (especially) exports into items which generate more value added per unit of output and feature higher world income elasticities of demand.

2.1 Overview

As mentioned in the introduction, Sri Lanka's economy grew explosively which brought about its own set of problems. Since the end of the civil war in 2009, it brought about immense investor confidence in Sri Lanka's economy about its untapped potential. This confidence, enthusiasm and exuberance were reflected in the stock market at the time, where the Colombo Stock Exchange (CSE) was the best performing stock exchange in the world for the year 2010 (The economy and the stock market performance, n.d.). In between the years 2009 to 2011, the stock market exploded with the All Share Price Index (ASPI), which is the broad market index of the CSE, rising by a stratospheric 412%.

Figure 2: ASPI CSE (CSE Interactive Stock Chart, n.d.)

But growth in the stock market does not mean actual growth in the economy. The reason is that the higher stock prices do not automatically translate into higher firm (corporate) investment. Shares are traded as assets between financial investors and it is only in the case of IPO's that stock markets fund real corporate capital formation. Financial investors, who are just a small fraction of the population, make wealth gains which may or may not lead to additional consumption spending and growth. Looking at the increase in the GDP per capita with Purchasing Power Parity (PPP) of Sri Lanka during the same period shows a roughly steady growth rate (figure 3). Hence the spike in the level of the stock market index did not translate to sudden wealth for the general population. In between the years 2007-2016 the GDP per capita, PPP, did grow by almost 82%.
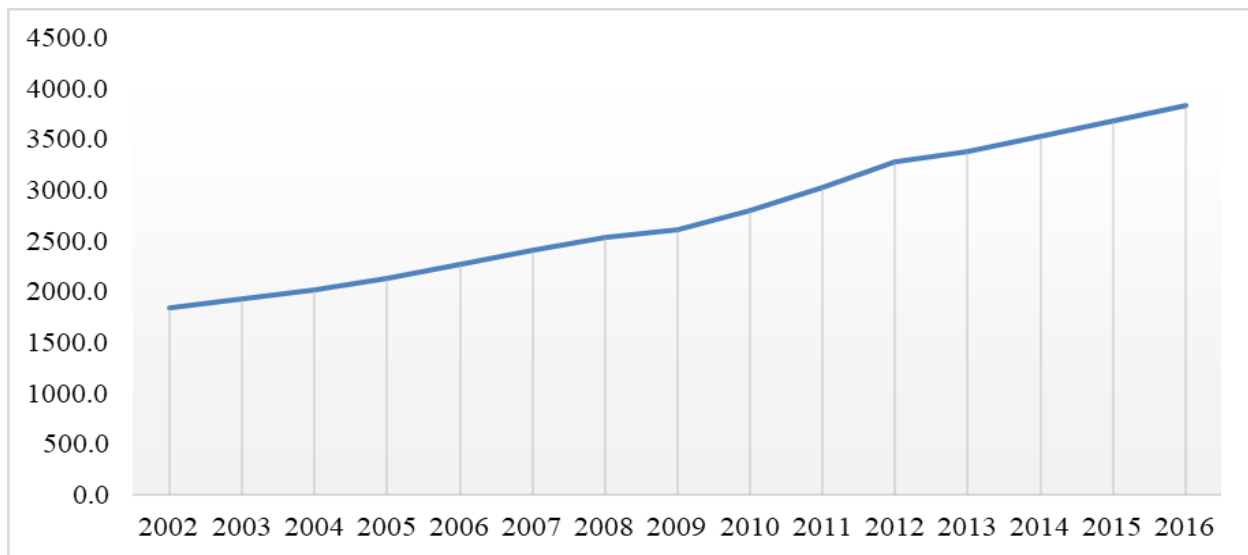
Figure 3: GDP per Capita, in constant prices $ for 2010 (World Bank Open Data, n.d.)

But once we start to look at the economic and social statistics of Sri Lanka published by the Central Bank of Sri Lanka (2017), one can see startling and worrying results and trends. Due to the civil war prior to 2009 Sri Lanka had a large military expenditure, which contributed to the budget deficit prior to 2009. Before 2011 (figure 4), Sri Lanka had a higher military expenditure as a percentage of GDP than the world average, after which it has reduced to somewhat to the world average level.
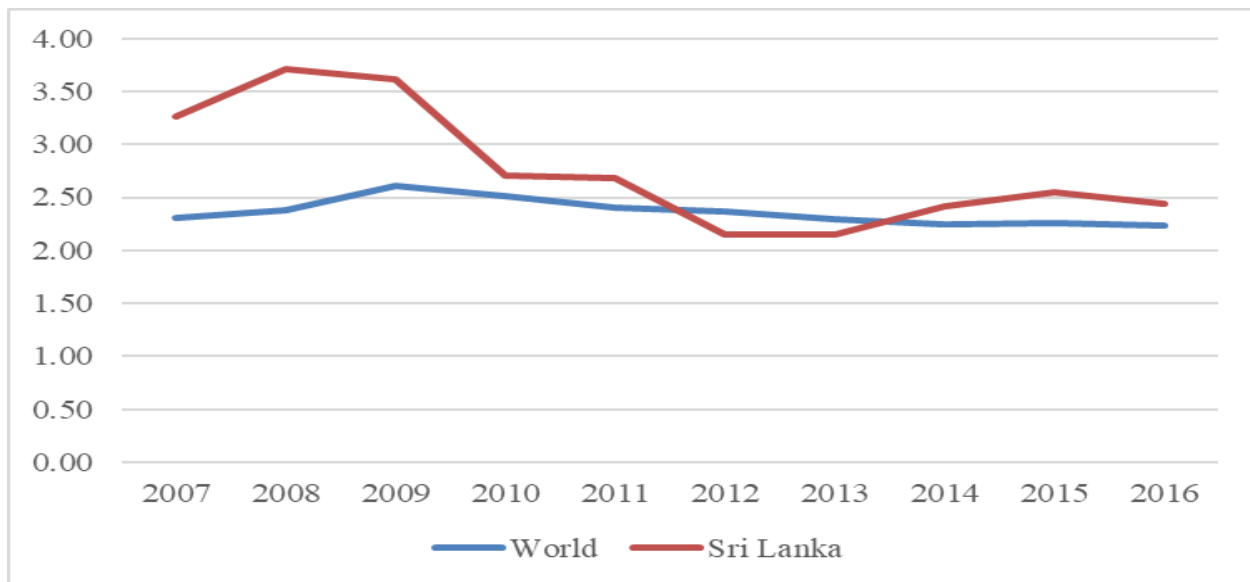
Figure 4: Military expenditure as a % of GDP (World Bank Open Data, n.d.)

Firstly, looking at figure 5, we can see that during the period 2007-2016 the overall budget deficit has increased enormously. The budget deficit has increased by almost 160% in this period, but during this duration government revenues have only increased by 198%.
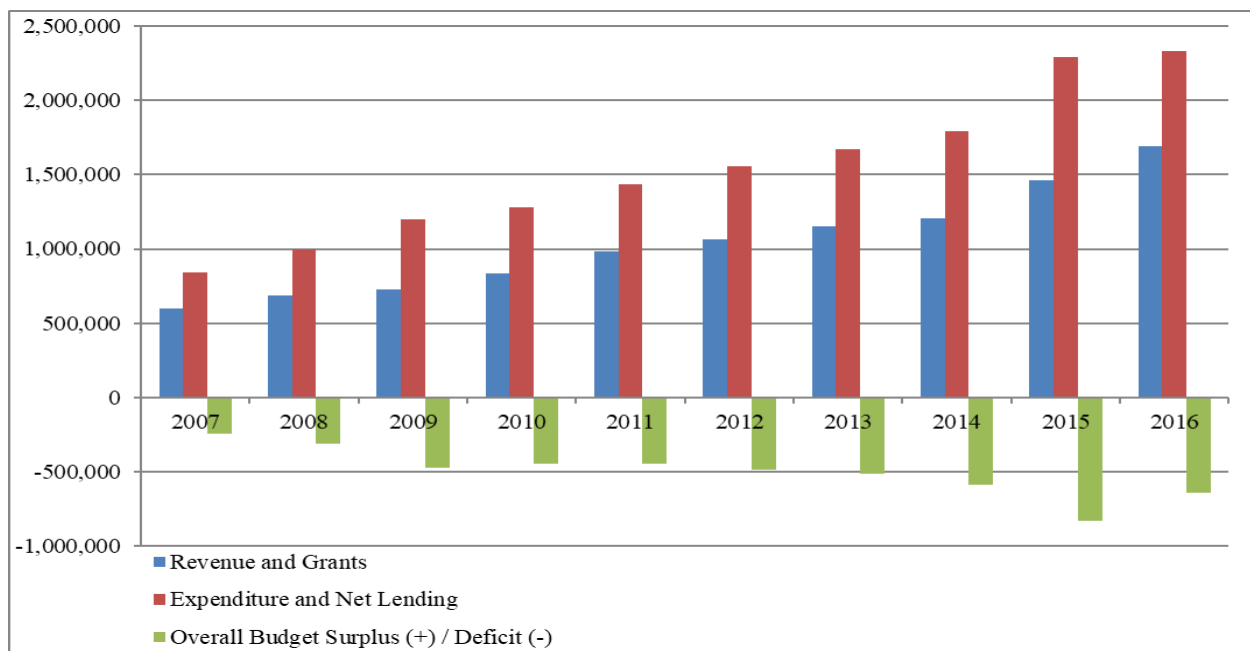
Figure 5: Revenues & Expenditures in Millions of Rupees (Central Bank of Sri Lanka, 2017)

During this same time duration, the total debt outstanding owed by the central government has increased by almost 209%, and interest payments have gone up by 234% (Figures 6 & 7). This unsustainable growth in loans has pushed the government towards the brink of defaulting, warranting a bailout by the IMF in 2016.
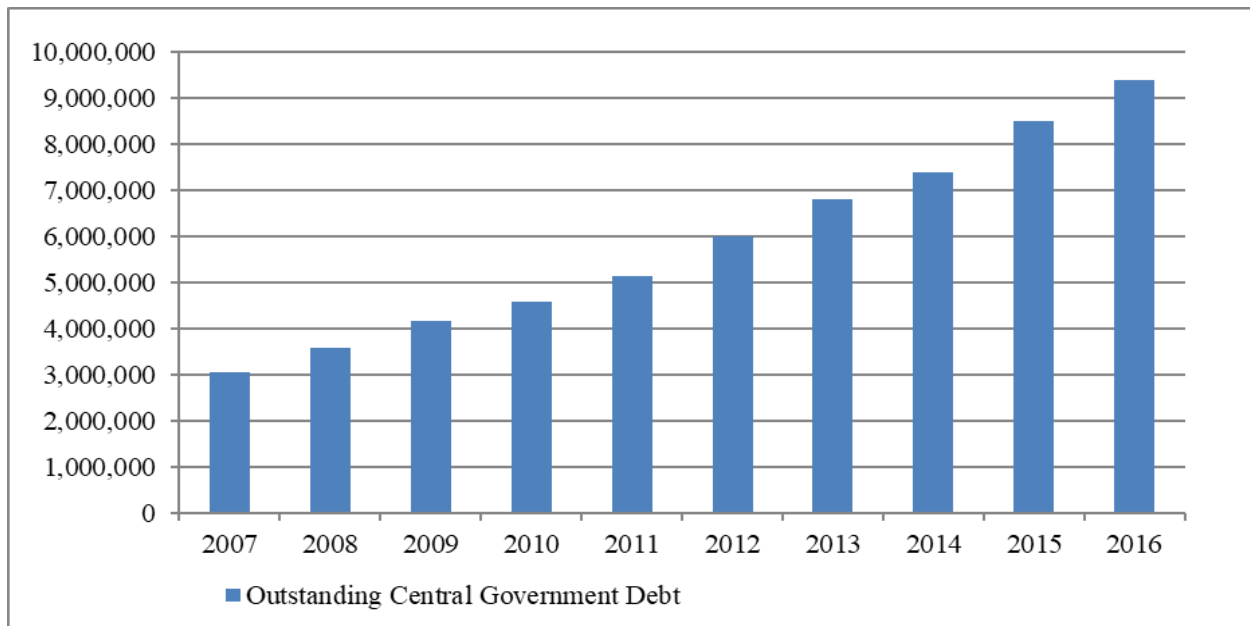
Figure 6: Outstanding Debt (Central Bank of Sri Lanka, 2017)
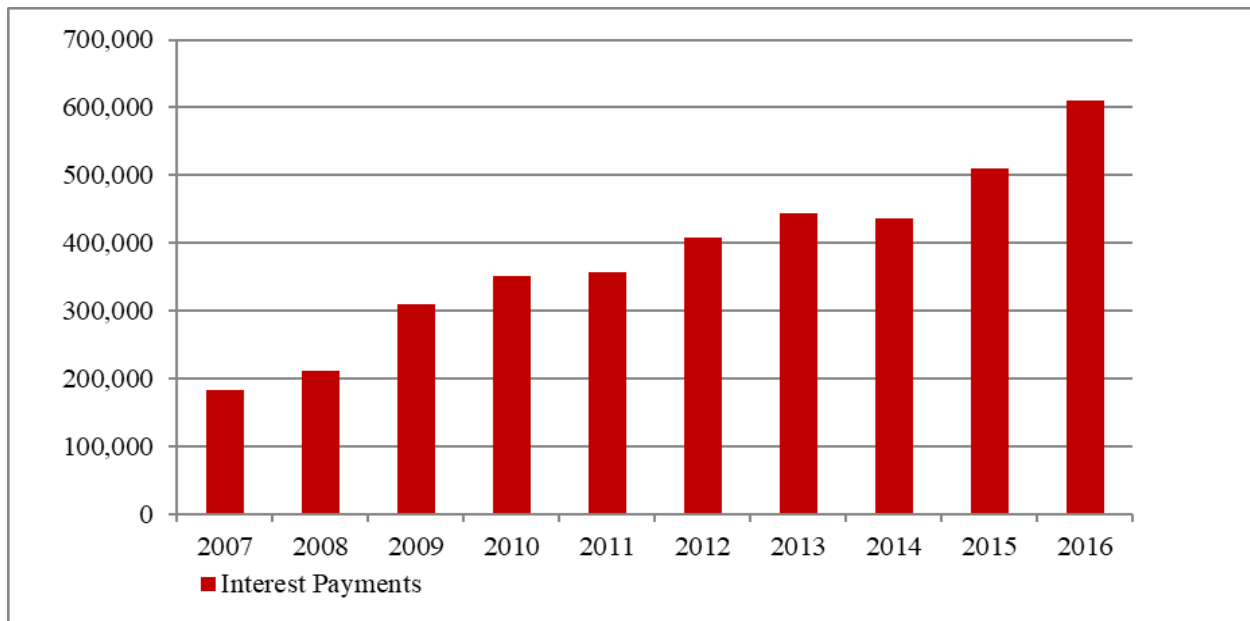
Figure 7: Interest Payments (Central Bank of Sri Lanka, 2017)

Secondly, another macroeconomic imbalance is the widening trade deficit of the Sri Lankan economy. While exports have increased by approximately 30%, imports on the other hand have increased by 36% widening the balance of trade (figure 8). This has added to the foreign exchange burden, due to a greater demand for foreign exchange by importers and less foreign currency brought into the country by exporters.

Figure 8: Exports, Imports and Balance of Trade in Millions of Rupees (Central Bank of Sri Lanka, 2017)

While this has caused foreign exchange constraints, it is also interesting to note that Sri Lanka receives a large influx of foreign exchange by means of migrant remittances from abroad (figure 9), which helps alleviate this burden, of a shortfall in foreign exchange, to an extent. Most of the migrant remittances come from the middle east (Central Bank of Sri Lanka, 2017), followed by the countries of South Korea and The Maldives, with remittances from the middle east region making up about 50-60% of the total remittances from abroad. The European Union makes up the second largest region of the remittances from abroad.
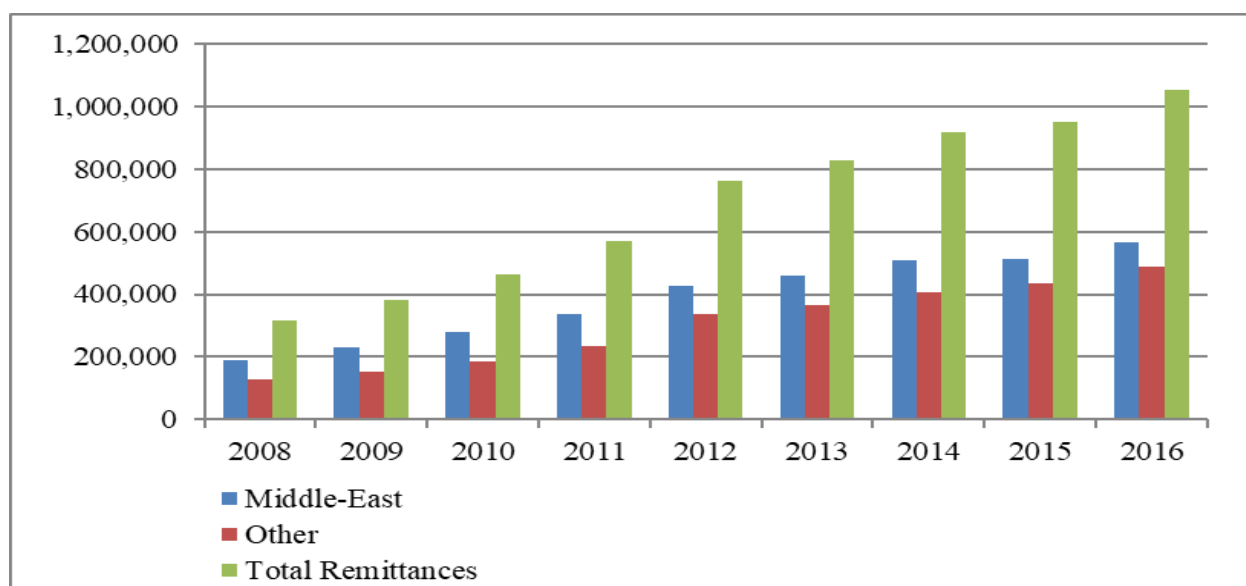
Figure 9: Total Remittances in Millions of Rupees (Central Bank of Sri Lanka, 2017)

Sri Lanka's balance of payments constraint is noteworthy, since today most developing countries are net exporters while developed countries are becoming net importers. According to the paper by Palley (2009), with today's globalized economy, policies favor developing countries to export their troubles away, but this is not the case for Sri Lanka. The root of this problem of course is Sri Lanka's dependence on its exports of low tech goods which is subject to competition from other much larger countries.
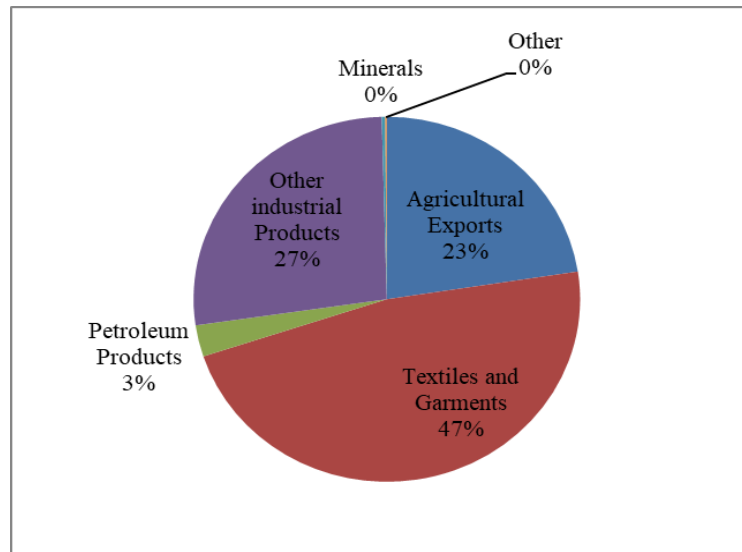
Figure 10: Export Composition for the year 2016 (Central Bank of Sri Lanka, 2017)

Textiles, garments and agricultural goods (Tea, Rubber and Coconut products) account for almost 70% of total exports from Sri Lanka as shown in figure 10 above, with textiles and agricultural goods accounting for 47% and 23% of exports respectively.

As can be evidenced from the data sheets, in 2006 Sri Lanka had the largest share in the global market in tea exports with 19.9% of the market. This has now shrunk to 17.4%, while Kenya's market share in this sector has increased from 19.8% to 27.3% in the same period. Adding to this fact is that agricultural goods are subjected to the power of the weather gods, and a bad harvest can be devastating to the economy with exports taking a big hit which can damage Sri Lanka's efforts to stabilize reserves. This was one of the advantages of industry cited by the Italian economist Antonio Serra (1613). He identified two other advantages of industry: it has a more secure market because industrial goods are not perishable; and he also recognized industry's increasing returns to scale, that is, industry can be multiplied proportionately with less expense.

Figure 11 also gives an overview of the import composition for Sri Lanka as well.
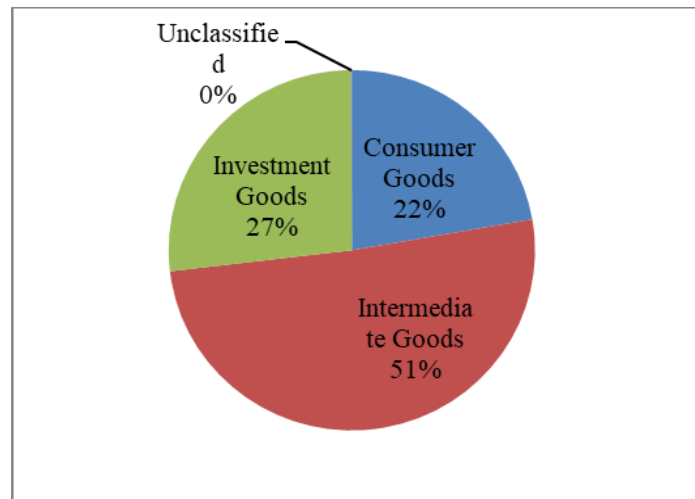
Figure 11: Import Composition for the year 2016 (Central Bank of Sri Lanka, 2017)

Here major consumer goods consist of goods such as food & drink, automotive equipment, electronics goods and medical & pharmaceuticals products. Intermediate goods consist of fertilizers, chemical compounds, fuels, wheat & maize, textiles, paper and dyeing and coloring materials. Finally, investment goods consist of building materials, transportation equipment and other machinery.

A third macroeconomic imbalance concerns the rise in non-project loans from abroad. As mentioned in the literature review, the working paper by Fernando, Silva, Naranpanawa, & Gunasinghe (2017), non project loans do not generate any revenues with which the initial loan amount and interest on them can be paid back. Figure 12 gives an overview of the growth of project & non-project loans over the period 2007-2016. During this period non-project loans showed a growth of almost 605%, while project loans showed a growth of about only 117% for the same period.
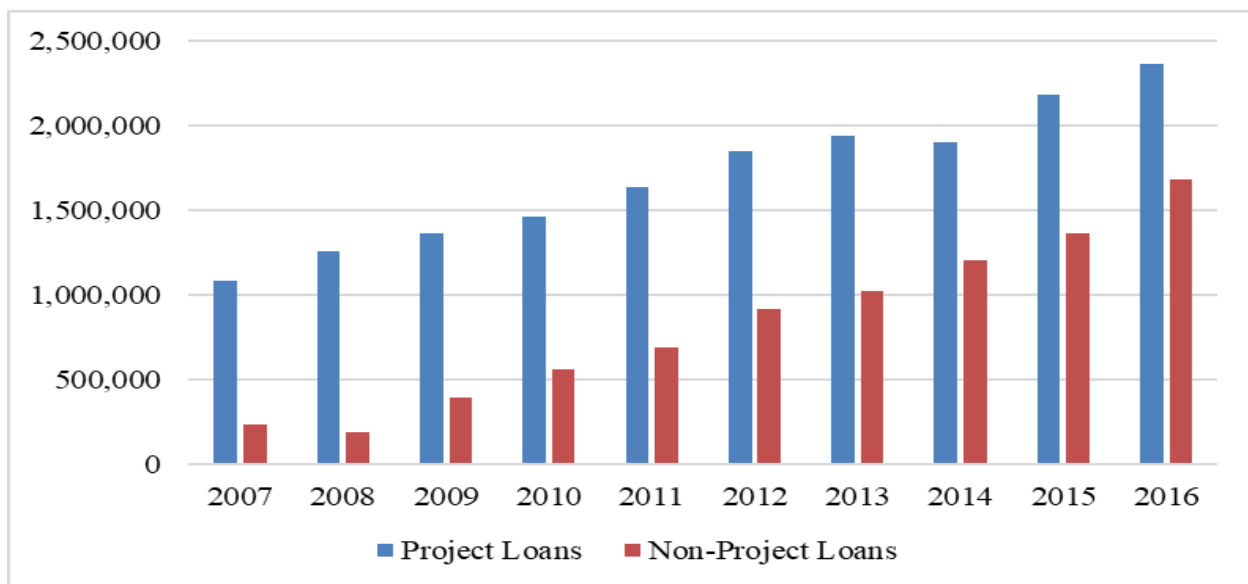
Figure 12: Project & Non-Project Loans (Central Bank of Sri Lanka, 2017)

As mentioned by Raghuram Rajan, former Chief Economist and Governor of the Indian Reserve Bank, in his book Fault Lines: How Hidden Fractures Still Threaten the World Economy (2010), the first stage in any country's growth is to see a rise in its textile and garment industries as evidenced by the countries like South Korea and Taiwan. These Tiger Economies had at one point, had textiles and garments as their largest exports, but today are well known for their semiconductor chips and high technology exports. These countries have made the transition to these high technology exports within a few decades, but Sri Lanka is still languishing in this low-tech sector for the past several decades, with low tech goods and labor-intensive industries such as clothing making up the highest composition of exports.

In line with the above thinking, a look at the high technology exports as a percentage of manufactured exports (Figure 13) shows Sri Lanka currently severely lacking in this area. The worldwide average in this parameter for this period was 17.4% while Sri Lanka's average was at an incredible low of 1.14%. Even its regional neighbors[1] India and Pakistan had higher averages with India having an average of 7.4%, with Pakistan being slightly above Sri Lanka.
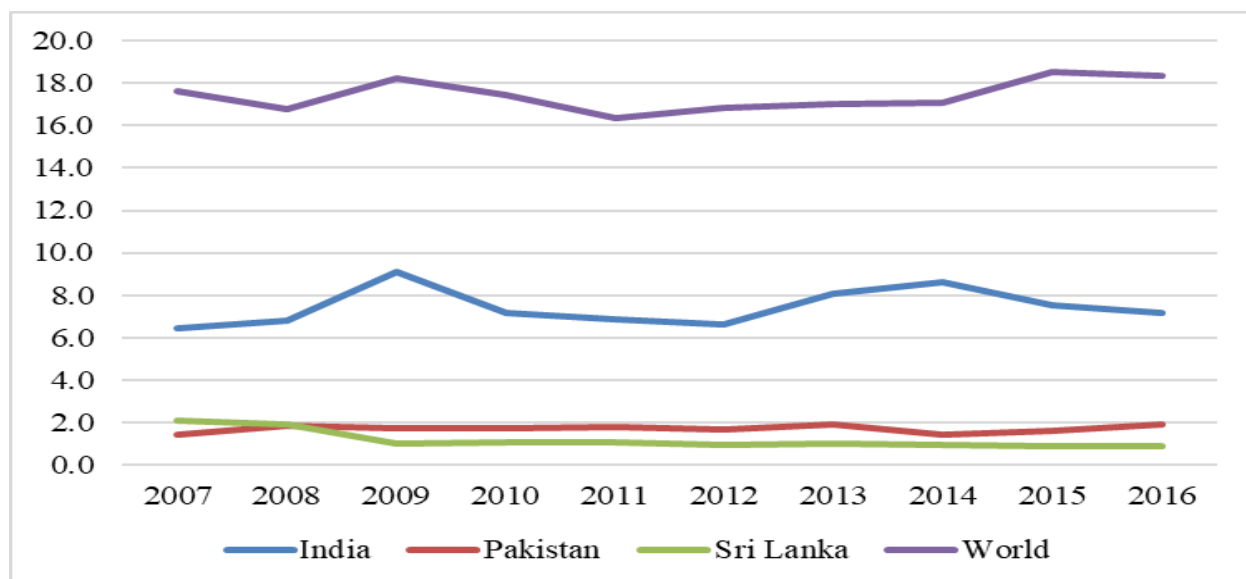
Figure 13: High-technology exports (% of manufactured exports) (World Bank Open Data, n.d.)

Another indicator of the Sri Lankan economy being dependent on the low technology sector can be seen from figure 14 which shows ICT service exports as a percentage of total service exports. Here Sri Lanka's trend in this parameter initially was somewhat similar to the worldwide trend, but after 2009, it diverges and has shown a downward trend in this category while the worldwide trend has been a slight increase. Even the countries in the SAARC region have shown an upward or constant trend in this sector, with India having a high average of 66.3%. Hence in a worldwide economy that is becoming increasingly reliant on Information & Communications Technology, Sri Lanka is starting to show a decreasing percentage of ICT exports as a percentage of its total service exports, contrary to the worldwide trend and those exhibited by its regional neighbors.

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[1] The other SAARC countries of Afghanistan, The Maldives, Bhutan, Bangladesh & Nepal were not mentioned due to unavailability of data, missing data or low significance for this parameter in the World Bank Database.
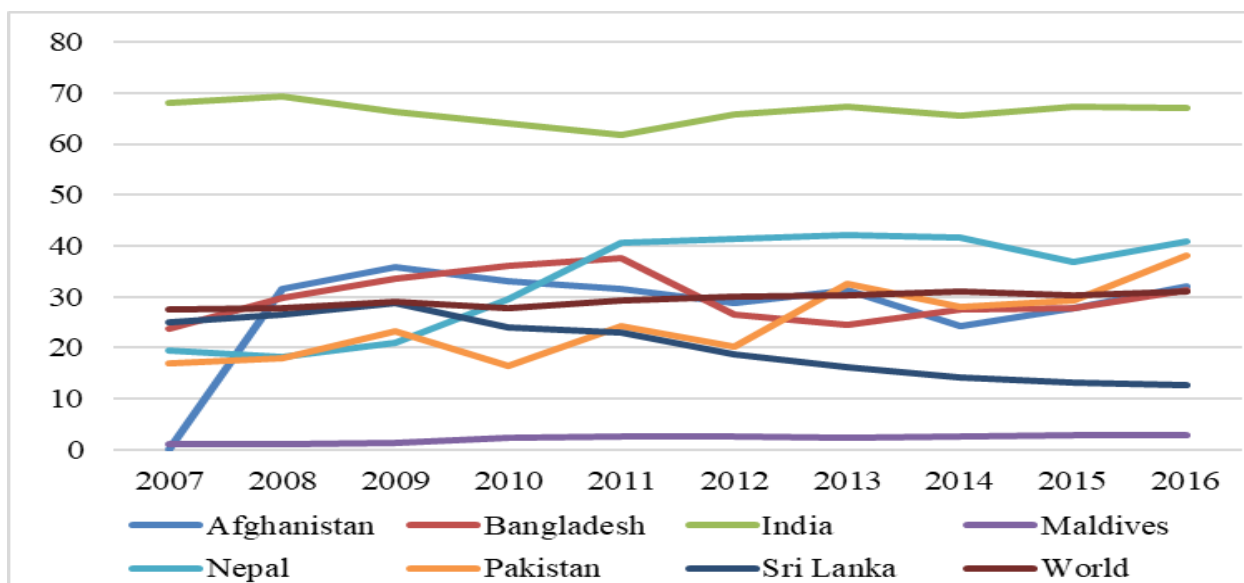
Figure 14: ICT service exports as a % of total service exports (World Bank Open Data, n.d.)

We will now look at the national accounts for Sri Lanka to get a better grasp of the situation. We first look at the identity for GDP as given below:

$$\text{GDP} = (\text{P+G}) + \text{I} + (\text{X-M}) \tag{1}$$

P = Private Consumption Expenditure
G = Government Consumption Expenditure
C = Total Consumption Expenditure
I = Total Investment
X = Exports
M = Imports
(X-M) = Trade Deficit/Surplus

The table below gives the total consumption (C), investment (I), exports, imports and trade deficits all as a percentage of GDP (Y). The table also gives foreign remittances (F) and the public debt as a percentage of GDP. We use this to understand any trends in this period of the Sri Lankan economy during the period 2007-2016.

Table 1 (Central Bank of Sri Lanka, 2017)

Year	C/Y (%)	I/Y (%)	X/Y (%)	M/Y (%)	T/Y (%)	F/Y (%)	Public Debt-to-GDP
2007	82.4	28.0	29.1	39.5	-10.4	7.7	85.0
2008	86.1	27.6	24.8	38.5	-13.7	7.2	81.4
2009	82.1	24.4	21.3	27.8	-6.5	7.9	86.2
2010	80.7	27.6	22.4	30.7	-8.3	8.3	71.6

2011	84.6	30.0	23.1	37.6	-14.6	8.7	71.1
2012	83.0	30.6	22.8	36.5	-13.7	10.1	68.7
2013	75.4	33.2	20.3	28.9	-8.6	8.6	70.8
2014	75.8	32.3	21.1	29.2	-8.1	8.8	71.3
2015	79.1	28.4	21.0	28.5	-7.5	8.7	77.6
2016	76.2	31.5	21.4	29.1	-7.6	8.9	79.3

The trend in consumption expenditure as a percentage of GDP is somewhat decreasing slightly during this period. Investment as a percentage of GDP shows a sharp rise in the years following 2009 peaking at 2013. In the year 2009, the civil war reached the closing stages finally ending in May, and investment shows a similar pattern, reflecting investor sentiments where I/Y was a minimum in 2009 (year highlighted) for the period 2007-2016 and rapidly rising following this. This is in line with what has been said about the rapid development in postwar Sri Lanka.

In the front of exports as a percentage of GDP it has somewhat remained constant after an initial decrease prior to 2009. Imports as percentage of GDP were high prior to 2009 and then rising again after 2009, peaking at 2011, after which it stabilizes. Imports as a percentage have been higher than exports for all the years during this period contributing to a trade deficit. The trade deficits (T/Y) show an increase prior to 2009, dipping in 2009, and then rising again in the years after which were the years where post war Sri Lanka experienced rapid development. The trade deficit has shown a gradual decline in the last few years for this period.

Sri Lanka's foreign remittances as a percentage of GDP has shown a gradual increase over this period showing the key role that migrant remittances play in the Sri Lankan economy. The overall public debt-to-GDP ratio increases prior to 2009, then decreases, and then increases once again gradually for the past four years, precipitating the current debt crisis. Hence overall it can be seen that Sri Lanka's GDP was slightly investment driven following the first few years after the civil war.

The above identity for GDP can also be rewritten as a function of savings and taxes as given below:

$$\textbf{GDP} = \textbf{P} + \textbf{S} + \textbf{T} \tag{2}$$

Where, S= private savings and T = direct/income taxes. When we subtract equations **(1)** and **(2)** for GDP, we get the new identity where,

$$\textbf{S} + \textbf{T} = \textbf{G} + \textbf{I} + \textbf{(X-M)}$$

Hence it can be seen that the total of saving and taxes are spent on goverment expenditure, invesntments, and to bridge the gap in case of any deficits. From this we get the following identity for investments as well:

$$\textbf{I} = \textbf{S} + \textbf{(T-G)} + \textbf{(M-X)}$$

Here we can se that the investment spending is function of private savings, public savings and foreign savings (the term **M-X**). While the term **M-X** refers to trade deficits, it can be understood

to be as foerign savings. This is because increased investments lead to greater imports and the excess imports have to be funded by foreign borrowing, since domestic savings have already been used up. Sri Lanka presents a case where in the period 2007-2016, there were no government savings nor foreign savings due to the presence of deficits. We now look at the break down of Sri Lanka's investment expenditure as a summation of domestic savings and net foreign transfers to understand the sources of economic growth.

Table 2 (Central Bank of Sri Lanka, 2017)

Year	I/Y (%)	D/Y (%)	NTW/Y (%)	FG/Y (%)	D/I (%)	NT/I (%)
2007	28.0	17.6	5.8	4.6	62.9	20.6
2008	27.6	13.9	3.9	9.8	50.3	14.2
2009	24.4	17.9	5.8	0.7	73.4	23.8
2010	27.6	19.3	6.0	2.3	69.9	21.9
2011	30.0	15.4	6.6	7.9	51.4	22.2
2012	30.6	17.0	7.0	6.6	55.4	23.0
2013	33.2	24.6	5.2	3.4	74.1	15.8
2014	32.3	24.2	5.6	2.5	75.0	17.2
2015	28.4	20.9	5.1	2.4	73.5	18.0
2016	31.5	23.8	5.1	2.5	75.7	16.3

Domestic Savings as a percentage of GDP (D/Y) has increased after the postwar period from 2009 onwards. This is also reflected in the Domestic savings as a percentage of Investment (D/I) which shows that after an initial decrease following 2009, a greater share of investment comes from domestic savings. Similarly, net transfers from the rest of the world as a percentage of GDP (NTW/Y) shows an increase after 2009 after which it decreases and remains somewhat constant the last few years. This is also reflected in the net transfers as a percentage of Investments (NT/I). which shows that a higher percentage of investments being funded by transfer from abroad, immediately after the end of the civil war, which then eventually decreases.

Since savings and net transfers alone were not sufficient for financing investment expenditure in the country, there was a financing gap and this gap as a percentage of GDP is also shown in table 2 as FG/Y. Here too it can be seen that following the end the of the civil war, the financing gap increases soon after which it decreases and becomes somewhat constant. Investment has been increasingly funded by domestic savings in the last few years as seen by the Domestic Savings as a percentage of Investments. As mentioned above, due to the lack of public and foreign savings, domestic savings are made up of mostly private savings.

2.2 IMF Extended Fund Facility Reviews

Due to the current debt crisis, Sri Lanka has initiated an Extended Fund Facility (EFF) arrangement with the IMF. The EFF, according to the IMF, was established to aid countries: (1) experiencing serious payments imbalances because of structural impediments; or (2) characterized by slow growth and an inherently weak balance of payments position (IMF Extended Fund Facility (EFF), n.d.). When a country borrows from this scheme under the IMF, it commits to undertake policies

to overcome its economic and structural problems. Hence the country is also subjected to periodic reviews, after which certain portion of the funds are released. Sri Lanka's EFF arrangement included a three-year commitment of US$ 1.45 billion under the assumption the government undertake certain reforms proposed by the IMF.

The IMF reforms recommended fiscal consolidation, improving tax reforms and tightening monetary policy, which in Sri Lanka's case is built on inflation targeting. While these measures can somewhat bring Sri Lanka's public finances under control, it comes at the sacrifice of GDP growth. This can harm and stunt potential long-term growth for the country due to short term fiscal consolidation. According to the IMF 2nd review Sri Lanka managed to hold growth rates steady despite fiscal consolidation, which in turn begs the question that could growth have been better if it did not? The budget surplus/deficit is calculated by the following equation:

Budget Surplus/Deficit= Government Revenues- Government expenditures

IMF policies tend toward reducing government expenditures rather than trying to increase govt. revenues. The IMF also recommends higher interest rates to curb credit growth and inflation, due to a rise in short term inflation. Increasing interest rates is bound to reduce future investments. This can also contribute to investors' expectations that interest rates might rise, to further dampen investments. The latest IMF review conducted on January 2018 (International Monetary Fund, 2018) as part of the EFF supported program identifies ways to bring the debt under control, but this is through debt management techniques such as fiscal consolidation, overhauling of tax reforms and through better management of State Owned Enterprises (SOEs).

The review also identifies the significance of agricultural output on the Sri Lankan economy. Since as mentioned above agricultural output is at the mercy of the weather gods, the review states that there was a contraction in the agricultural GDP in 2017, due to severe weather conditions in 2016 and 2017, leading to a shortage of food which then lead to greater food imports, increasing domestic inflation and adding to the already burdened trade deficit. The outlook describes that real GDP growth can recover given the return of normal weather conditions. A smaller share of agriculture in the overall GDP mix will enable Sri Lanka to withstand greater external shocks, especially weather which out if control of mankind, to the economic system. The review also brings to light the various state-owned enterprises (SOEs) which have added to the debt burden due to their loss-making behavior and weak financial performance.

The review does not state any recommendations to change the underlying structure of the economy to high growth sectors which can increase exports reducing trade deficits, rather focusing on the current economic composition and stressing on increased fiscal consolidation in conjunction with tax reforms as the way out of the debt crises. The paper by Felici, Nucci, Ricchi, & Tegami (2017) highlights certain risks with concentrating on fiscal consolidation. The paper stresses that fiscal consolidtion can turn out to be self defeating, and they often have a contractionary effect on economic activity in the short to medium run. The contracionary effects are also magnified when fiscal consolidation is carried out during a recessionary phase, as well as when it is carried out by a number of countries rather than by a single country in isolation due to negative spillovers induced through trade linkages.

The paper also iterates that ususally fiscal consolidation can be balanced out by a reduction of the interest rate, since this will balance out the withdrawal of government investment with pumping more private investment in the economy. But this is not the case in Sri Lanka, since fiscal consolidation is done in conjuction with tightening monetary policy rules to reduce credit growth and inflation. Hence not only does this reduce government investments but also stifles private investment as well. The paper by Irons & Bivens (2010), states that high debt does not cause low growth, but that causality runs the other way, low growth tends to cause high debt-to-GDP ratios. Hence if the above mentioned risks of recessions and fiscal consolidation by other countries were to hit at the same time, Sri Lanka's economy could face a severe downturn. The success of the IMF policies in Sri Lanka depends on worldwide economy thiriving, to avoid a major downturn.

Hence by looking at the overview of the Sri Lankan economy and the IMF reviews we can see that Sri Lanka must incorporate policies where sustainable growth is achieved: where the government builds up sufficient solvency to address interest payments, reducing trade deficits by way of gearing the economy towards sectors which have high growth potential to increase its exports, as well as avoiding propping up the economy with bailouts, which reduces creditworthiness and increases interest rates for new borrowing. The following chapter will now elaborate on the BoP theory that tries to satisfy these conditions within the macroeconomic constraint that Sri Lanka has found itself in, and also tries to eliminate risks that are related to worldwide economic downturns.

3. Balance-of-Payments Theory

As mentioned above in the introduction and chapter 2, the situation in Sri Lanka can be envisioned as an economy which has to undergo a fundamental change so as to be competitive in the global climate, but it is encircled and constrained by the macroeconomic debt that it has piled on over the years. Further fueling growth through means of rash investments will only end up adding to the debt burden. An appropriate model for this current crisis, taking into these various considerations, would be the aggregate model developed by Anthony Thirlwall in 1979 called BoP Constraint Growth Model, and the two extensions of these models which take into account the different sectors in the economy which contribute to growth, as well as the effect of capital inflows on the long run BOP constrained growth rate.

3.1 Aggregate Model

Keynesian economics states that demand is the key driver of the economic system to which supply adapts. Hence there is an inherent difference between growth rates in countries, since there is a difference in the growth of demand between them. The aggregate model which is often called Thirlwall's Law, developed by Anthony Thirlwall (1979), states that the dominant constraint in an open economy is the constraint on continuous expansion of demand brought about by the BoP. BoP refers to balancing the exports and imports so as to avoid deficits. A healthy BoP is necessary to maintain a sustainable economic growth rate. If a country gets in to BoP difficulties while it expands demand and before its short-term capacity growth rate is reached, then demand must be curtailed; supply is never fully utilized; investment is discouraged which then worsens the BoP constraint starting a vicious cycle (Thirlwall, 1979).

But if a country is able to expand demand without BoP constraints, capacity growth can continue to grow since there won't be any constraint on demand. This can bring about greater investment and technological progress; the supply of labor may increase and the removal of constraints on imports may increase capacity by making domestic resources more productive. This model supports the main argument of export led growth; it is through the expansion of exports that the growth rate can be raised without the BoP getting worse (Thirlwall, 1979). However, the same rate of growth of exports between different countries cannot lead to the same output growth, since each country will have different import requirements for its output growth and some of these countries might have to constrain their demand in order to avoid BoP problems. Hence the aggregate model put forward by Thirlwall in (1979) and revised (2011) states that the long run growth rate will be determined by the ratio of its gorwth of exports to its income elasticity of demand for imports.

The model derivation is elbaorated below as it appears in Thirlwall (1979), Thirlwall (2011) and Filho, Jr., & Libânio (2011). For BoP equilibrium, current account is first balanced in terms of exports and imports in home currency units as:

$$P_{dt}X_t = P_{ft}M_tE_t \qquad (2)$$

Where X is the quantity of exports; P_d is the price of exports in home currency; M is the quantity of imports; P_f is the price of imports in foreign currency; E is the exchange rate (the home price of foreign currency) and t is time (Thirlwall A. P., 1979) (Filho, Jr., & Libânio, 2011).

The rate of growth of the individual variables is then given by taking the natural logarithm and then differentiating with respect to time:

$$p_t + x_t = p_f + m_t + e_t \qquad (3)$$

The lower-case letters represent rates of change for the respective variables.

The domestic demand for imports is then specified as function of the price of imports, the price of domestic goods and the domestic income:

$$M_t = a\left[\frac{P_{ft}E_t}{P_{dt}}\right]^{\psi} Y_t^{\beta} \qquad (5)$$

Here a, is a constant, and ψ (<0) and β (>0) are, respectively, the price elasticity and the income elasticity of demand for imports. The expression in parenthesis is the current real exchange rate[2]. Similarly, the demand for a country's exports is given as a function of the relative prices and world income:

$$X_t = b\left[\frac{P_{dt}}{P_{ft}E_t}\right]^{\eta} Y_{ft}^{\delta} \qquad (6)$$

Here b, is a constant, η (<0) and δ (<0) are, respectively the price elasticity and the income elasticity of demand for exports. Taking the natural logarithm of the above equations gives us:

$$ln\,M_t = ln\,a + \psi\,ln\left[\frac{P_{ft}E_t}{P_{dt}}\right] + \beta\,ln\,Y_t \qquad (7)$$

---

[2] The Czech National Bank defines the real exchange rate as, "The real exchange rate R is defined as the ratio of the price level abroad and the domestic price level, where the foreign price level is converted into domestic currency units via the current nominal exchange rate. The real rate tells us how many times more or less goods and services can be purchased abroad (after conversion into a foreign currency) than in the domestic market for a given amount. In contrast to the nominal exchange rate, the real exchange rate is always "floating", since even in the regime of a fixed nominal exchange rate E, the real exchange rate R can move via price-level changes" (ČNB, n.d.).

$$ln\ X_t = \ ln\ b + \eta\ ln\left[\frac{P_{dt}}{P_{ft}E_t}\right] + \delta\ ln\ Y_{ft} \tag{8}$$

Differentiating the above equations with respect to time then gives the growth rates for the imports and exports which are then given by:

$$m_t = \psi\ (p_{ft} + e_t - p_{dt}) + \beta y_t \tag{9}$$

$$x_t = \eta\ (p_{dt} - p_{ft} - e_t) + \delta y_{ft} \tag{10}$$

The price and income elasticities of exports and imports reflect the production structure of the economy.
Substituting the above equations (7) and (8) in equation (2) and after algebraic manipulations we get the resulting growth rate of the economy over time, compliant with BoP equilibrium as:

$$y_t = \frac{(1 + \eta + \psi)(p_{dt} - p_{ft} - e_t) + \delta y_{ft}}{\beta} \tag{11}$$

If the real terms of trade prevailing in international trade do not vary, that is if relative prices in international trade or real exchange rates are constant, the following simplified equation is obtained:

$$y_t = \frac{\delta y_{ft}}{\beta} = \frac{x_t}{\beta} \tag{12}$$

Hence according to this expression, the domestic growth rate that is compatible with long term external BoP is determined by the ratio of the growth rate of exports and the income elasticity of demand for imports. This is what is termed as Thirlwall's Law. Thirlwall says that it is possible for an economy to grow for long periods of time below its BoP equilibrium rate accumulating trade surpluses, while it is not possible to grow above this rate accumulating trade deficits continuously, since financial markets start to get nervous once certain debt-to-GDP ratios are reached (Filho, Jr., & Libânio, 2011) (Thirlwall, 2011). This model for Sri Lanka's case would translate to as follows:

$$Growth\ rate\ of\ Sri\ Lanka = \frac{Income\ elasticity\ of\ Demand\ for\ Sri\ Lankan\ Exports \times World\ income\ growth}{Income\ elasticity\ of\ Demand\ for\ imports\ of\ Sri\ Lanka}$$

The BoP was thought to be a self-adjusting in orthodox economics, with no income adjustment required (Thirlwall, 2011). It was supposed to be self-equilibrating, since countries that were in surplus, accumulating gold, would lose competitiveness through raising prices, and countries in deficit would gain competitiveness through falling prices. After the introduction of a flexible

exchange rate, *if the real exchange rate is flexible and the Marshall-Lerner[3] condition is satisfied (where the sum of the price elasticities of demand for exports and imports is greater than unity), the balance of payments will equilibrate*. The flexible exchange rate was found not to be a good balancing mechanism (Thirlwall, 2011). Firstly, this is because it is not easy to adjust the real exchange rate unlike the nominal one. Secondly the Marshall-Lerner condition may not be satisfied in the short run or because of the nature of the goods the country is exporting or importing. Hence the BOP model states that the balance of trade had to be brought about by the change in domestic income.

3.2 Multisectoral Model

This model is based on the approach of the importance of supply factors and the structure of production in the determination of long run growth rates. Hence the BoP constrained model has been extended for a multisectoral economy where the demand varies over time at different rates for each particular sector. The resulting "Multisectoral Thirlwall's Law" (MSTL) states that a "*country's growth rate of its per capita income, is directly proportional to the growth rate of its exports, with such proportionality being inversely (directly) related to sectoral income elasticities of demand for imports (exports)*" (Gouvêa & Lima, 2013). The simplified (and empirically implementable) form of the model as it appears in Gouvêa & Lima (2013) is as follows:

$$g_{MB} = \frac{\sum_{j=1}^{n} a_j \varepsilon_j z}{\sum_{j=1}^{n} b_j \pi_j} \qquad (13)$$

Where g_{MB} is the rate of growth of domestic income consistent with long run balance of payments equilibrium, ε_j is the elasticity of demand for exports of sector j ($j = 1,2, \ldots n$), π_j is the income elasticity of demand for imports of sector j, a_j is the share of sector j in total exports, and b_j is the share of sector j in total imports (Gouvêa & Lima, 2013).While Thirlwall's law implies that a country's growth rate can only will only grow when the growth rate of exports grows, through the growth of world income, the MSTL implies that growth rate of a country can be raised, even when there is no growth of world income, provided said country is able to change its sectoral composition of exports and/or imports. Hence MTSL enables the identification of key strategic sectors of the economy for long run growth while at the same time ensuring BoP (Gouvêa & Lima, 2013). This model when applied for Sri Lanka's case will enable us to find out which sectors have to be grown, while the country is still in this macroeconomic debt bubble, since it is through a rise in exports and sufficient surpluses can Sri Lanka effectively manage its debt position.

3.3 Capital flows

The equilibrium condition with capital inflows with BoP of an economy is given by the following equation (Filho, Jr., & Libânio, 2011):

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[3] What the Marshall-Lerner condition means is that when the sum of price elasticities is greater than unity, then with a nominal devaluation of home currency, the revenues earned from the increase in the quantity of exports due to this devaluation, must offset the revenues lost due to devaluation and there has to be a sufficient drop in the demand for imports as well to ensure balance of trade.

$$\frac{p_d}{E}X + F = P_fM + R \tag{14}$$

Where F is the net value of foreign capital inflows and R is the value of interest payments on existing stock of the foreign debt. The interest payments depend on the stock of existing debt and the interest rate. There are usually two kinds of capital flows. They are called direct investment and speculative investment. Direct investments are used for producing goods and services and do not affect the debt directly. Speculative investments on the other hand target the debt stock directly by aiming to obtain financial revenue via the interests. Hence the variable F can be elaborated in the following manner:

$$F = I_d + I_e \tag{15}$$

Here I_d is the net value of capital inflows as direct investment, while I_e is the net inflow of speculative investment (Filho, Jr., & Libânio, 2011). While this extension will not be statically tested here, the purpose of showing this extension is to show how migrant remittances play apart in Sri Lanka's economy. Sri Lanka has another significant source of foreign income, and that is the migrant remittances which can be added to the left-hand side of equation 14. The advantage of this migrant remittances is that no interest needs to be paid for this source of income and can be considered a windfall for the Sri Lankan government, enabling it to import more goods than is possible without the remittances.

A panel data analysis of 90 countries for estimates of the coefficients were done by Gouvêa & Lima (2013). These estimates gave significant results with respect to the effect of GDP per capita on the volume of exports and imports, while the effect of the real exchange rate was found to be insignificant in several cases. These estimates gave highly significant and high estimates for several categories such as in petroleum, machinery, labor intensive and other industries, for exports and imports. All these industries had a high-income elasticity of demand for exports >2 and income elasticity of demand for imports >1 at the 1% significance level. What these elasticities signify, is the percentage rise in exports and imports when the world income and country level income increase by 1 percentage point. Tropical agriculture showed an income elasticity of demand for exports and imports <1, significant at the 1% level. It is important to note that these were worldwide estimates for *income elasticities of demand for exports and imports*. Gouvêa & Lima (2013) also find *the weighted income elasticity of exports & weighted income elasticity of imports* for Sri Lanka, which are 1.24 & 1.15 respectively for the period 1965-1999. These estimates are then compared with the ones obtained for Sri Lanka's case in the next chapter.

Neto & Porcile (2017) also estimate the income elasticity of exports for some selected latin american countries and find high estimates for some countries for the high technology manufacturing sector (Colombia-4.24, Chile-3.85, Mexico-6.91, Venezuela-8.55). Venezuela has the high elasticity for this sector, which is surprising since it is a developing country and is not known for its high technology exports. Gouvêa & Lima (2013) also calculated the MTSL growth rate for the 90 countries which also included Sri Lanka. The estimated MTSL growth for Sri Lanka was 1.93% while the actual growth rate was 3.10%, with a difference of the growth rates of 1.18%. It should be noted that the estimation period for the elasticities and the growth rates were from

1965-1999. Thirlwall & Hussain (1982) also estimate the aggregate level Thirlwall's Law growth rate for Sri Lanka for the period 1951-1969. This was found to be 5.9% and the actual growth rate was found to be 6.1% for this period with a difference of 0.2%.

This chapter gives an overview of the Balance of payments constrained growth model and its different versions, the aggregate model and the multisectoral model. It also presents estimates of the elasticities and the MTSL growth rate for Sri Lanka from prior literature to get an understanding of their values. The next Chapter tests out this model empirically for Sri Lanka to evaluate the different elasticities for the various industries that makes up Sri Lanka's production structure and then to finally calculate the multisectoral growth rate to understand whether Sri Lanka has been growing faster than the recommended MTSL growth rate and if so by how much.

As mentioned in chapter three the equations for imports and exports as a function of the GDP per capita and the real exchange rate is given by equation **(7)** & **(8)** and are mentioned below once again,

$$ln \, M_t = \, ln \, a + \psi \, ln \left[\frac{P_{ft}E_t}{P_{dt}}\right] + \beta \, ln \, Y_t \tag{7}$$

$$ln \, X_t = \, ln \, b + \eta \, ln \left[\frac{P_{dt}}{P_{ft}E_t}\right] + \delta \, ln \, Y_{ft} \tag{8}$$

As can be seen from the equations above, for equation 7, the dependent variable is the volume of imports for different industry categories and the independent variable is the GDP per capita of Sri Lanka and the real exchange rate. For equation 8, the dependent variable is the volume of exports for different industry categories and the independent variables are the GDP per capita of the world, and the reciprocal of the real exchange rate. Hence data for these variables were collected before regression was carried to estimate the coefficients. To first carryout this analysis, trade data for Sri Lanka was obtained from the data site of the World Trade Organization (WTO), which included import and export data for all merchandize categories. The categories of focus were narrowed down to 7 major categories. These were Agricultural goods, Fuels and Mining products, Chemicals, Iron and Steel, Machinery and transport equipment, Textiles, and Clothing. There were several sub categories under these major categories, but due to limitations of data availability[4], they were narrowed down to seven. These seven categories cover the breath of the production structure of Sri Lanka's economy and also well represented Sri Lanka's major exports & imports as well. The data from the WTO was preferred over Central Bank data due to the availability of more categories and a longer time series till 1990 since Central Bank data was only available till 1996.

Since all the sectorial import and export data were in nominal terms and not available in volumes, they needed to be converted to constant prices to represent volumes for exports and imports. For this, price indexes for the various industry categories were obtained from the U.S. Bureau of Labor Statistics (MXP News Releases, n.d.) to convert the nominal terms to constant prices. Since industry level export & import price index with relevant time series for Sri Lanka was not available, proxy data in the form of worldwide industry level export & import price indexes was taken. All the variables were converted into constant terms with 2010 as the base year. Data for GDP per capita for the world and Sri Lanka at 2010 constant prices were obtained from World Bank Indicators. The relevant prices indexes were converted to the base year of 2010 as well.

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[4] There were missing data for several subcategories for several years for certain industries. For example, machinery and transport equipment were further divided into Electronic data processing equipment, telecommunications equipment, integrated circuits and automotive parts. Data was missing for a substantial number of years for these categories, hence these were clubbed into a single category of machinery & transport equipment.

Some key assumptions were made while working with the data. The overall real exchange rate was used for all categories during the data analysis. For the real exchange rate, the US GDP deflator was divided by the Sri Lankan GDP deflator, multiplied with the nominal exchange rate. The GDP deflator was used, rather than the individual price indexes, since this will reflect the major macroeconomic changes in the world (Gouvêa & Lima, 2013). The induvial price effect was not considered in the equation, since this is reflected in the real exchange rate. The data for the GDP deflators were obtained from the World Development Indicators (WDI) and the historical LKR/USD exchange rate was obtained from the data bank of the Federal Reserve Bank of St. Louis (Sri Lanka / U.S. Foreign Exchange Rate, n.d.). For data related to nominal exports and imports of Fuels and Mining products, price index for fuels were used to convert them to constant prices, since mining products composes only a small percentage of total exports. Similarly, the category for chemicals consists of pharmaceuticals as well, while the price index for chemicals used was exclusive of pharmaceutical products. For machinery a weighted price index was calculated, using the price indexes of automotive parts, computers and semiconductors, and industrial and service machinery. For some categories, price indexes for the entire time series wasn't available hence analysis was done for the ones available. Another major condition was the period chosen. For some industries a period of 1990-2016 was used, while for others a period of 1992-2016 was used. The reason being, going beyond this period to earlier years resulted in significant missing data for several industries or price indexes were not available for earlier periods for certain industries. There was missing data for the period selected as well, but not so much was missing that data analysis couldn't be carried out.

Following the regression results the MSTL growth rate for Sri Lanka can be calculated from equation **(13)** from chapter 3.

4.1 Estimation Results

Once the regression was carried out the coefficients for β (income elasticity of demand for imports)**,** ψ (price elasticity of demand for imports)**,** δ (income elasticity of demand for exports)**,** & η (price elasticity of demand for exports) were given as follows in the table below with their significance. The variable RER in table 3 refers to the real exchange rate in the above equations 7 & 8. The variable GDPW in table 3 refers to the GDP per capita of world income (the variable Y_{ft} in equation 8) and the variable GDPSL refers to the Sri Lankan GDP per capita (the variable Y_t in equation 7).

Table 3: Estimation results of the sectoral export and import functions. (Note: Significant at *p < 0.1, **p < 0.05, ***p < 0.01)

Exports							
Industry Category	GDPW	RER	Constant	R Square	Durbin-Watson	dL	dU
Agriculture	2.112***	0.096	2.690	0.923	0.721	1.019	1.318
Chemicals	3.605***	0.205	-13.528**	0.918	0.950	0.959	1.298
Clothing	3.104***	-0.196	-7.398**	0.937	0.637	0.981	1.305

Fuels & Mining	3.036**	-2.348***	-20.352	0.349	0.981	0.915	1.284
Iron & Steel	1.433	-0.666	-1.346	0.037	1.327	0.862	1.270
Machinery	8.023***	-0.998**	-58.481***	0.926	1.005	0.959	1.298
Other Manufacturing	2.729***	0.085	-3.632	0.857	1.126	0.862	1.270
Textiles	1.652**	-0.234	2.813	0.357	0.340	0.938	1.290

Imports							
Industry Category	GDPSL	RER	Constant	R Square	Durbin-Watson	dL	dU
Agriculture	0.767***	0.108	14.778***	0.869	1.333	1.019	1.318
Chemicals	1.041***	-0.183	13.722***	0.950	1.683	0.959	1.298
Clothing	2.751***	2.103***	-13.240***	0.946	1.246	0.862	1.270
Fuels & Mining	0.945***	-0.277	15.603***	0.832	1.149	1.019	1.318
Iron & Steel	1.438***	0.308	7.065***	0.926	0.972	0.915	1.284
Machinery	1.904***	0.008	6.596**	0.956	1.695	1.019	1.318
Other Manufacturing	1.408***	-0.042	10.360***	0.974	1.699	0.862	1.270
Textiles	1.046***	0.803***	9.140***	0.900	1.460	0.981	1.305

Along with the regression, the Durbin-Watson test was carried out as well. The Durbin-Watson values gives an indication for serial autocorrelation among the residuals. Here the Durbin-Watson test statistic is used to test the null hypothesis of zero autocorrelation in the residuals against the alternative that residuals are positively autocorrelated at the 1% level of significance. The Savin and White tables gives the critical values for the Durbin-Watson test. Here the critical values are given in a range, a lower bound dL and an upper bound dU. If the Durbin-Watson test statistic is below the lower bound (dL) then the null hypothesis of non-autocorrelated errors is rejected in favor of the hypothesis of positive first order correlation. If the test statistic is greater than the upper bound (dU), the null hypothesis is not rejected. If the test statistic is between dL and dU then the test is inconclusive, and we err on the side of conservatism and not reject the null hypothesis of zero autocorrelation (Durbin-Watson Signifance Tables).

As can be seen for imports the Durbin-Watson test statistics were all greater than dU or were in-between dL and dU, hence the null hypothesis was not rejected. For exports all the sectors, except for Agriculture, Chemicals, Clothing & Textiles, showed a test statistic between dL and dU or greater. The test statistic for Agriculture, Chemicals, Clothing & Textiles were all lower than dL, indicating that the residuals were positively correlated. Hence the coefficients for these sectors had to be corrected for serial autocorrelation among the residuals. One method of correction is using the Prais-Winsten test which deals with AR1 errors. After the test was carried out, the new regressions coefficients are given below along with the new Durbin-Watson test statistic. As can be seen from the table below, there is a change in the coefficients and the new Durbin-Watson test statistic is within or greater than the dL and dU bounds.

Exports					
Industry Category	GDPW	RER	Constant	R Square	Durbin-Watson
Agriculture	2.004***	0.119	3.774	0.790	1.616
Chemicals	3.647***	0.219	-13.842**	0.836	1.529

Clothing	3.243***	-0.211	-8.742**	0.862	1.770
Textiles	3.061***	-0.128	-9.485	0.343	1.086

As can be seen from the table above, all the price elasticities have a low value, being higher than 1 in absolute value in two sectors (Fuels & Mining Products-Exports, and Clothing-Imports), and being highly significant in both these cases. The price elasticity of import demand for textiles and clothing are significant but have the unexpected positive sign while the price elasticity of export demand for machinery and Fuels & mining are significant but have the unexpected negative sign. For import price elasticity of sectors fuels and mining products, chemicals and other manufacturing have the expected negative sign, while they are not significant. Export price elasticity of sectors agriculture, chemicals and other manufacturing have the expected positive sign but are not significant. Hence as can be seen from the results the price elasticities have a lower impact (Due to their lower coefficients) on the behavior of exports and imports and therefore on the long run growth rate.

The *income elasticity of demand for exports* all have the expected positive sign and other than for the sector of Iron & Steel, are all highly significant as well. This is due to the fact this sector is not very prominent in Sri Lanka. The exports of Iron and steel does not compose a significant part of Sri Lanka's exports. The explanatory power is reflected in the R square which has a low value of 0.037 for the Iron & Steel sector, indicating that only 3.7% of the variance of the dependent variable is explained by the independent variable. For the Fuels & Mining and Textile sectors, the income elasticity of demand for exports are high and significant, but the R Square is low at 0.349 & 0.343 respectively. This is because Sri Lanka is well known for its clothing & apparel industry and not for its textile exports. Similarly, there is no crude oil exploitation in Sri Lanka, and exports in the fuels and mining sector deal with refined products such as diesel and petroleum products.

The clothing sector, which belongs to the labor-intensive industry, shows a high elasticity of 3.243 for exports. This is higher than the elasticity for the labor-intensive sector obtained by Gouvêa & Lima (2013) in their panel data study of 90 countries (2.163) which was highly significant as well. This is due the fact that Sri Lanka has built up specialization in this sector. The textile sector, which belongs to the capital-intensive industry, shows an elasticity of 3.061, which is higher than the estimate obtained by Gouvêa & Lima (1.544), but the explanatory power is low, with a R square of only 0.343. The agricultural sector shows a high elasticity of 2.004, way higher than the one obtained by Gouvêa & Lima (Tropical Agriculture=0.681). One possible reason could be the specialization and dependence of Sri Lanka's exports on agriculture which has a high contribution to its export composition and its position as the second largest tea exporter in the world. Another reason being that the estimate obtained by Gouvêa & Lima is for 90 countries, which could include countries that do not specialize in agricultural goods.

The chemical sector also shows a very high-income elasticity of 3.647. This is more than 100% higher than the estimate obtained by Gouvêa & Lima (1.640) for the chemical sector, showing a potential area of investment and diversification in Sri Lanka's export composition. By far the highest estimate is for the machinery industry, with a highly significant elasticity of 8.023, far higher than the estimate of that obtained by Gouvêa & Lima (2.376). Even though this is a very high estimate, it should be noted that machinery forms on average only about 5% of the total export composition (for the period that the elasticity was calculated) and in no way, means that Sri Lanka

has a well-developed and mature machinery industry. But it is important to note that this estimate is in line with estimates that have been done for this sector, by other authors, for other developing countries that we highlighted in the previous chapter, where Mexico and Venezuela showed a high elasticity of 6.91 and 8.55 respectively for the high technology sector. What is shown is the potential this sector could have for Sri Lanka's exports. It is also interesting to note that the machinery sector shows the second highest elasticity after "others" in Gouvêa & Lima's estimates as well. Other Manufacturing has an elasticity of 2.729 and what is important to note here is that this sector on average makes up almost 15% of total export composition.

The income elasticity of demand for imports are all highly significant at the one percent level for all the sectors and have the expected signs as well. The agriculture and Fuels & Mining sectors have elasticities less than one while all the other sectors have elasticities higher than one, with the clothing sector having the highest elasticity of 2.751 followed by the machinery sector with an elasticity of 1.904. Contrary to the estimates obtained by Gouvêa & Lima, Sri Lanka's imports show a higher income elasticity of demand for labor intensive sectors (Clothing) than for capital intensive sectors (Textiles), when compared with the panel data for 90 countries.

Once the income elasticities for export and imports have been obtained, the weighted income elasticities are then calculated by using the share of each sector in total exports and imports. Using this the Multisectoral Thirlwall's Law (MTSL) growth rate for Sri Lanka is calculated from equation 13 and this BoP constrained growth rate is then compared with the actual growth rate of Sri Lanka. Table 4 below shows the actual average per capita GDP growth rate and the MTSL growth rate for the period of 1990-2016 over which the data analysis was done.

Table 4: Weighted income elasticities, average per capita GDP & MTSL

Weighted Average Income Elasticities of demand for Exports	Weighted Average Income Elasticities of demand for Imports	Average MSTL Growth Rate (%)	Average Growth rate- GDP per Capita (%)
2.98	1.15	3.75	4.64

It is interesting to note that the *weighted average income elasticity of demand for imports* is the same as that obtained by Gouvêa & Lima (2013) for Sri Lanka for the period 1965-1999, while the *weighted average elasticity of demand for exports* is more than twice as large than the one estimated by Gouvêa & Lima. As can be seen from table 4, the average Multisectoral Thirlwall's Law recommended growth rate for this period is at 3.75% taking into the consideration the weighted export and import elasticities and the growth of world income. The actual growth rate for this period is at 4.64%. This is almost higher by 0.89 percentage points. Gouvêa & Lima's (2013) estimate of the difference in the growth rate for Sri Lanka for the period 1965-1999 is 1.18 percentage points. The following figure shows the annual growth rates & the MTSL growth rates for the period 2001-2016 to get a sense of when Sri Lanka exceeded the recommended MTSL growth rate.
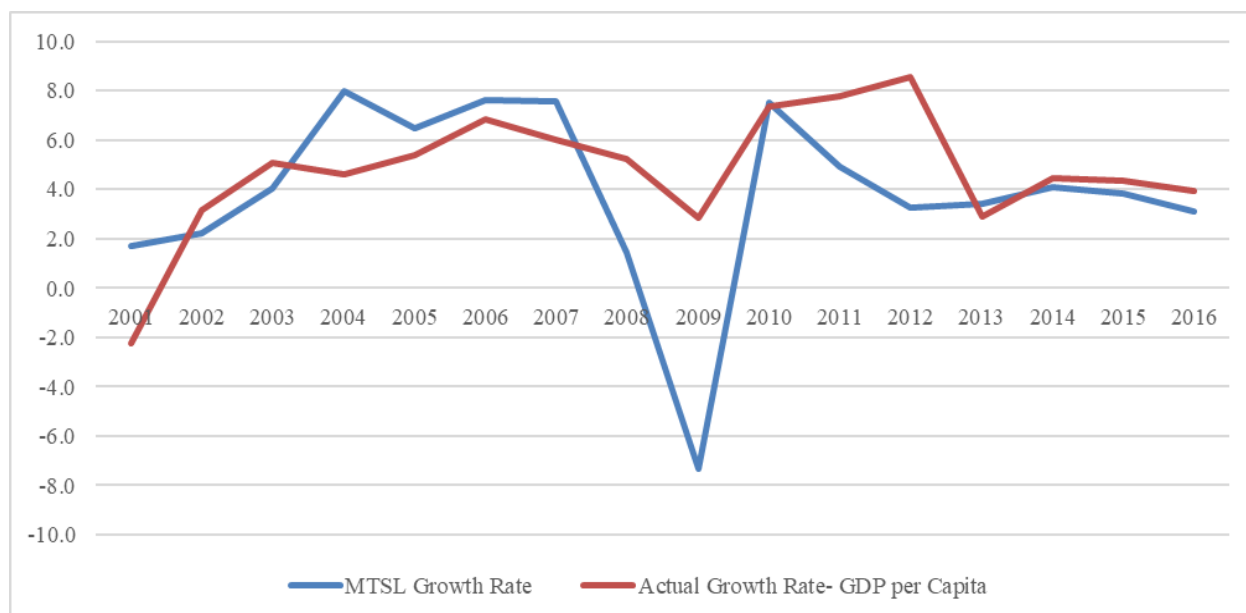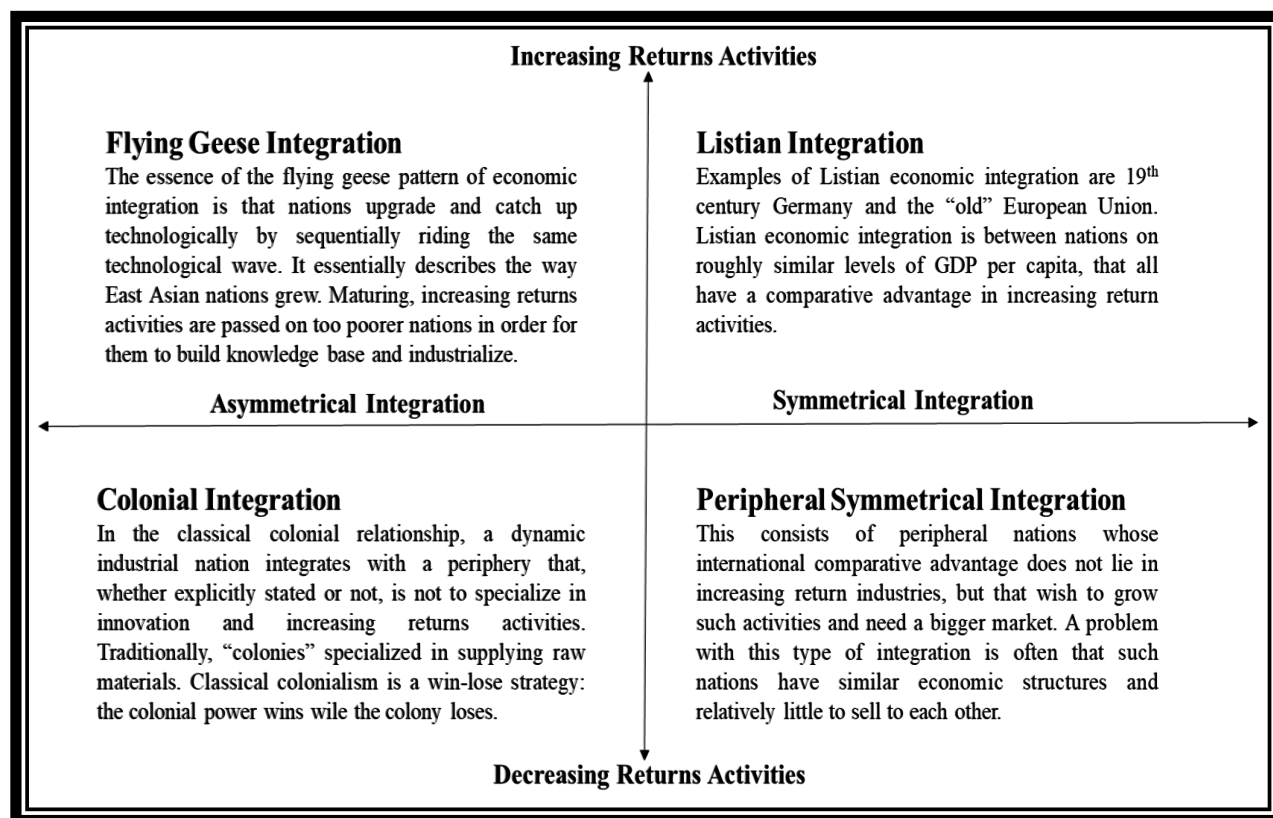
Figure 15: MTSL & Actual Growth Rate

As can be seen from figure 15 after 2007, the actual growth rate exceeds that of the recommended MTSL growth rate. The difference between the actual growth rate and the MTSL is very pronounced in the years 2008 and 2009. This difference was mainly as a result of the drop of the world income due to the financial crisis (Sri Lanka was still in a state of emergency during this period) which saw the world GDP per capita drop from its 2008 levels by 2.93% in 2009 and then rebound back by 3.06% in 2010. Another reason being the civil war ended in Sri Lanka in the first half of 2009, hence the Sri Lankan economy did not fall as much. Both the growth rates rebound higher in 2010 and the difference between the two growth rates is smaller here but then diverges in the years to follow till 2013. This divergence can be attributed to the fact that the civil war had ended in 2009, following which Sri Lanka showed rapid growth fueled by huge inflows of capital enabling it to grow faster than what was possible contributing to a large rise in imports during this period. This coincides with a large net flow of FDI as well, which would have been necessary to grow faster than the MTSL growth rate (as seen in figure 21 in Chapter 5).

Hence the economy of Sri Lanka grows faster than possible, but as mentioned by Thirlwall, this isn't without consequences. What the BoP constrained growth rate recommends is a growth rate that is maximized but also ensures that trade is balanced. Any increase beyond this point will result in deficits. Hence since 2007, Sri Lanka has grown faster than the recommended MSTL growth rate accumulating deficits and debt as a consequence of this fast-paced growth. What can now be observed is that to increase the MTSL growth rate, in order to reduce the difference between the actual growth rate and the MTSL, so that Sri Lanka can grow faster without the need for accumulating further deficits, there has to be an increase in the share of exports of high elasticity goods. A higher share of the total exports in high elasticity sectors will increase the weighted income elasticity of demand for exports, which in turn will increase the MTSL growth rate. Hence this shows that concentrating in high elasticity goods enables a country to grow much faster but ensuring balance-of-payments at the same time.

Hence now the question turns to, given the current production structure of the Sri Lankan economy, how can Sri Lanka bring about a change in its current production structure so as to incorporate a greater share of high technology goods in its exports so as to bring about an increase in its MTSL growth rate? The process of structural transformation is considered challenging for developing and emerging countries, since advanced countries have already possessed and accumulated the enabling capabilities and the productive capacities and are pushing the technology frontier through research and innovation. The only way out for developing countries is to catch up rapidly by learning to master these technologies that are already present in developed countries (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). Hence to answer this question, we turn to the Flying Goose model of development that was used by the East Asian countries during the era called the "east Asian miracle" where they underwent rapid economic development and growth. This theory will be elaborated in the next chapter and Sri Lanka's economic structure will be diagnosed further to understand Sri Lanka's current economic standing in the context of the Flying goose model so as to come up with relevant policy recommendations.

5. The Flying Goose Model & Kojima Extensions

The results of the previous chapter have established the relevance of moving from labor intensive industries to more capital intensive and technology-oriented industries. According to Kattel, Reinert, & Suurna (2009), economic development is seen as a goal created by increasing returns innovations in manufacturing and not in agriculture, where stagnant productivity and diminishing returns prevent growth. But how can a developing country catch up to its more advanced peers rapidly? To answer this question, we need to first understand economic integration of countries within their respective regions. Integration can be of two types: symmetrical integration (i.e., integration among nations at a similar level of economic development and economic sophistication), and asymmetrical integration (i.e., integration of nations with widely different economic structures at different levels of development). The taxonomy of the different types of integration derived from years of economic history is as follows.

Increasing Returns Activities

Flying Geese Integration
The essence of the flying geese pattern of economic integration is that nations upgrade and catch up technologically by sequentially riding the same technological wave. It essentially describes the way East Asian nations grew. Maturing, increasing returns activities are passed on too poorer nations in order for them to build knowledge base and industrialize.

Listian Integration
Examples of Listian economic integration are 19th century Germany and the "old" European Union. Listian economic integration is between nations on roughly similar levels of GDP per capita, that all have a comparative advantage in increasing return activities.

Asymmetrical Integration — **Symmetrical Integration**

Colonial Integration
In the classical colonial relationship, a dynamic industrial nation integrates with a periphery that, whether explicitly stated or not, is not to specialize in innovation and increasing returns activities. Traditionally, "colonies" specialized in supplying raw materials. Classical colonialism is a win-lose strategy: the colonial power wins wile the colony loses.

Peripheral Symmetrical Integration
This consists of peripheral nations whose international comparative advantage does not lie in increasing return industries, but that wish to grow such activities and need a bigger market. A problem with this type of integration is often that such nations have similar economic structures and relatively little to sell to each other.

Decreasing Returns Activities

Figure 16: Taxonomy of Economic Integrations. Adapted from "Industrial Restructuring and Innovation Policy in Central and Eastern Europe since 1990" by Kattel, R., Reinert, E. S., & Suurna, M. (2009)

Sri Lanka was once colonized by the Portuguese, the Dutch & the British and gained independence in 1948. Till independence was achieved, Sri Lanka belonged to the Colonial Integration quadrant. Sri Lanka was a major a spice hub during the colonial era and the British later introduced tea to

the Sri Lankan highlands. Once independence was gained Sri Lanka then moved away from this quadrant. Sri Lanka's current economic integration can be sorted into the peripheral symmetrical integration type. This is because Sri Lanka is member of the South Asian Association for Regional Cooperation[5] (SAARC) and the members of this group can be thought of as having similar economic structures, where all the countries belong to the developing nations category and are highly agriculture dependent. Evidence is also presented below where the SAARC members all have high comparative advantages in the textile industry, while having low comparative advantage in the machinery sector, proof that they have somewhat similar economic structures. A large portion of Sri Lanka's exports are also agriculture dependent, which does not belong to the increasing returns category. For Sri Lanka to reach rapid economic development it needs orient its economy towards the flying geese integration type to develop its increasing returns activities while simultaneously integrating with countries with different levels (higher levels) of economic development. The Listian quadrant doesn't apply here since the member countries have varying GDP per capita with Sri Lanka's GDP per capita at Purchasing Power Parity (US$ 12313) almost twice of India's (US$ 6571), and India's almost twice of Bangladesh's (US$ 3580) (World Bank Open Data, n.d.) and they don't have many industries which have comparative advantages in increasing returns activities.

The flying geese (FG) model or pattern of development was first developed and introduced by Kaname Akamatsu during the 1930s (Kojima, 2000). This model explains the rapid industrialization and economic development and growth experienced by the East Asian countries (the so called "Asian Miracle") and the catching up process in latecomer economics. In essence the FG model takes the prospective of the developing country. It describes how a new product is introduced to the less developed country via imports and then how this country acquires the necessary production techniques to become exporters of this particular product (Dowling & Cheang, 2000). The Kojima extensions then extend this theory with the vital role that foreign direct investment plays in this action of acquiring necessary production techniques.

The FG model consists of two patterns: (1) a basic pattern, where a single industry grows tracing out three successive curves of imports, production and exports; and (2) a variant pattern in which industries are diversified and upgraded from consumer goods to capital goods. Hence the name flying goose model derives from the shape of the import, export and production curves which represent flying geese. This FG pattern of industrialization is transmitted from a lead goose to follower geese such as the Newly Industrializing Economies (NIEs) and Association of South East Asian Countries (ASEAN)[6]. The relevance of this theory with respect to Sri Lanka's problem is that it will give us insights into understanding how developing countries, like Sri Lanka, can rapidly shift their structure of production from a more labor-intensive environment to a more capital-intensive program (high technology industry), and the relevant factors that go into achieving this rapid change. This change is required if the Sri Lankan economy has to grow at a fast pace maintaining balancing of payments as recommended by the MTSL growth rate in the previous chapter.

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[5] The SAARC (South Asian Association for Regional Cooperation) group of countries consist of Afghanistan, Bangladesh, Bhutan, India, Nepal, the Maldives, Pakistan and Sri Lanka.
[6] The NIEs refer to Hong Kong, Republic of Korea, Singapore, & Taiwan. The ASEAN countries are composed of Indonesia, Malaysia, Singapore, The Philippines, Thailand, Brunei, Cambodia, Laos, Myanmar & Vietnam.

The chapter is divided into several sections as follows. The first three sections elaborate on the theory of the FGM, and the fourth section diagnoses Sri Lanka's past and current economic standing by means using certain parameters such as the investment-saving gap, the trade dependence ratio and the revealed comparative advantage etc. This is done to understand whether Sri Lanka has started to move in to the FGM pattern of development and if it has, to understand at what stage of the FGM Sri Lanka is in, in order to derive relevant economic policy recommendations to speed up this process of technology diffusion from developed countries and towards industrialization.

5.1 The Basic Pattern of Development

The basic sequential pattern in the FG model shows how the imports (M), domestic production (P) and exports (E) of a particular consumer good changes with time in less advanced countries as observed and developed by Akamatsu during Meiji Japan. Akamatsu observed that the development of Japanese industries began with the import of a new product from more advanced countries, followed by import-substituting production, and then finally advancing to exports (Kosai & Tho, 1994). There are five stages of involved in the development of this pattern over the life cycle of a typical industry (Kojima, 2000) (Dowling & Cheang, 2000).

Stage 1: When an underdeveloped nation enters the international economy, the nation's specialties are exported and industrial products for consumption are imported (Kojima, 2000). A new consumer good is introduced to the domestic markets through imports. Consumer demand for this product increases gradually which sets the stage for domestic production initiation. The domestically produced goods cannot compete with their imported counterparts due to their inferior quality and high production costs. Imports will remain high for some time, which may cause a run on the country's foreign exchange (Dowling & Cheang, 2000).

Stage 2: Here domestic production of the imported consumer good picks up for the local market, drawing domestic capital to the activity. Hence in the FG model, consumption by imports is considered as the establishment of the foundation for self-production. National policy then stimulates this trend towards domestic production (Kojima, 2000). This is often done by putting certain tariffs and other import restrictions to protect the domestic industry from foreign competition. The import of the particular consumer good slows and then decreases as domestically produced goods replaces the foreign imports, due to a protected domestic market and the acquisition of standardized production technology, but the import of machinery (capital goods) for the production of that particular good (consumer good) from advanced nations rises due to the need of these in the domestic production of the consumer good. Domestic production starts picking up once the demand for the consumer good is large enough (Kojima (2000), Dowling & Cheang (2000)).

Stage 3: Here the domestic consumer industry for the consumer good develops into the export industry, as the growth of domestic demand starts to slow. The products are now manufactured for the domestic markets as well for exports which has started to pick up, and production is kept at a high level. The domestic production for the imported machinery (capital good) now starts to pick up as well at this point. The strong exports enable the country to import more leading to continued expansion of the economy (Kojima (2000), Dowling & Cheang (2000)).

Stage 4: In this stage the consumer good industry in the underdeveloped nation attains the same standard as the advanced country, and these countries are no longer less-advanced countries as far as this particular consumer industry is concerned. In this stage, this advanced status is further improved. The export of this consumer goods begins to decline, as production of the consumer good slows down due to increasing costs and competition from late industrialization countries. Production of this consumer good is now starts shifting into less advanced countries and development of this industry has now taken place in a flying geese pattern moving from an advanced country to an underdeveloped country and from there to the next underdeveloped country in time. The capital goods that were produced domestically in the third stage, now starts to get exported. Hence the decreasing consumer exports is replaced with increasing capital goods exports. Hence the "less advanced wild geese" are continuously chasing the lead geese ahead of them who are continuously innovating and maintain a certain distance by means of technologically and heterogenous products (Kojima (2000), Dowling & Cheang (2000)).

Stage 5: At this stage, due to increases in wages and other production costs, the domestic firms start to lose comparative advantage in the industry. Hence the industries are now forced to relocate to survive. Reverse importation of the consumer product starts, while the exports of the capital good picks up (Dowling & Cheang, 2000).

5.2 Variant Pattern of Diversification

The FG pattern of development enables the progression from simple goods to more complex goods which can be seen from the earlier progression of consumer goods to capital goods. The diversification can take place in two ways. One is through intra-industry cycles where new products are created with an existing industry. The other is an inter-industry cycle where the development of new industries occur. Each cycle can undergo *rationalization of production* which enhances the efficiency and competitiveness of the industry. *Diversification of production* on the other hand upgrade the structure of industries and exports. Hence according Kojima (2000), interactions and parallel progress in rationalization and diversification of production contribute to stimulate national development.

5.3 The Kojima Model Extensions

Model 1- Rationalization and Diversification: This model is related to the variant pattern of diversification of the FGM. Assume that an economy initially produces two goods, X (labor intensive) and Y (capital intensive). Initially the economy will specialize in the production of the labor intensive good and eventually build a comparative advantage in this good, because its relative cost is low due to a lower wage rate. As the economy now grows due to its specialization in the labor intensive good X, the demand for labor and the relative wage will increase. This will make the economy shift its factor allocation of labor and capital to the production of the Y good, since it is the more labor-saving industry. The industries for goods X and Y also increase their efficiency in their respective industries to reduce the amount of labor required for a given amount of output. This structural change where the economy upgrades from the production of good X to good Y (from labor intensive to capital intensive) is referred to as *diversification*. This diversification can be observed in stage 4 of the FGM's basic pattern (Kojima, 2000).

Another way the economy can grow is through the path of rationalization of industries. Let us assume for example that the production of Y good takes place using an inferior α-mode of technology. This will make the unit cost of production to be high. This unit cost can be reduced, while keeping to a constant factor intensity, through shifting to a more superior β mode of production. Hence rationalization of an industry takes place by means of technological progress, economics of scale, learning-by-doing and accelerated intra-industry product cycle (Kojima, 2000). The diversification towards a more capital-intensive industry and the rationalization move towards a superior mode of production enhances the efficiency of the economy as whole increasing the per capita income. Since both the paths of *diversification & rationalization* requires the accumulation of capital they are undertaken alternately, with diversification of new industries taking place first, followed by a steady rationalization of each industry. This then leads to rapid production growth and trade expansion (Kojima, 2000).

Model 2- Pro-Trade-Oriented (PROT) foreign direct investment (FDI): Take a lead goose country (an advanced country *A*) where its exports of a labor-intensive good continues to rise till a peak is reached. The exports then start to decline, since the country starts to lose its comparative advantage due to rising wages which is a benefit of economic growth. A follower goose (less-advanced country *B*), where the wage level is much lower, can now start the production of the labor-intensive good. This production is facilitated by means of the country *A's* firms making FDI, through the transfer of capital, superior technology and managerial skills. These firms gain the comparative advantage again through country *B*. The labor intensive good is now sold in the domestic markets of the country *B*, and over time some portion of this good is imported by country *A* as well. Meanwhile, as mentioned in stage 4, the country *A* starts to export its capital goods and increases production in this area. Hence, we can see that the lead goose production structure shifts from labor intensive to capital intensive, while the follower goose gains the production facilities of the labor intensive good through means of foreign direct investment. This is termed by Kojima (2000) as pro-trade-oriented FDI.

Hence, an important feature of the PROT-FDI is that FDI is undertaken from a country A's comparatively disadvantaged industry, making its foreign production in country B to achieve a stronger comparative advantage, through providing capital goods and technology. Meanwhile, in country A export of capital goods expands, since resources released from the production of labor intensive products are diverted to capital goods production. Hence this type of FDI brings about comparative advantages in both countries (country A- capital goods, country B-labor intensive goods). This is what is called as FDI led growth. Kojima (2000) also talk about antitrade oriented (ANT-) FDI. This when firms undertake FDI in import-restricting countries, bypassing tariffs and trade barriers and once they are in, they monopolize (or oligopolize) local markets by preventing the entry of other multinationals. This type of FDI may not be beneficial for the FDI receiving country and it is in the country's interest to ensure liberalization of trade.

Kojima (2000) also talks about the investment frontier, where the spread of PROT-FDI can be visualized over time as warm front on the weather map. The figure below depicts the investment frontier.
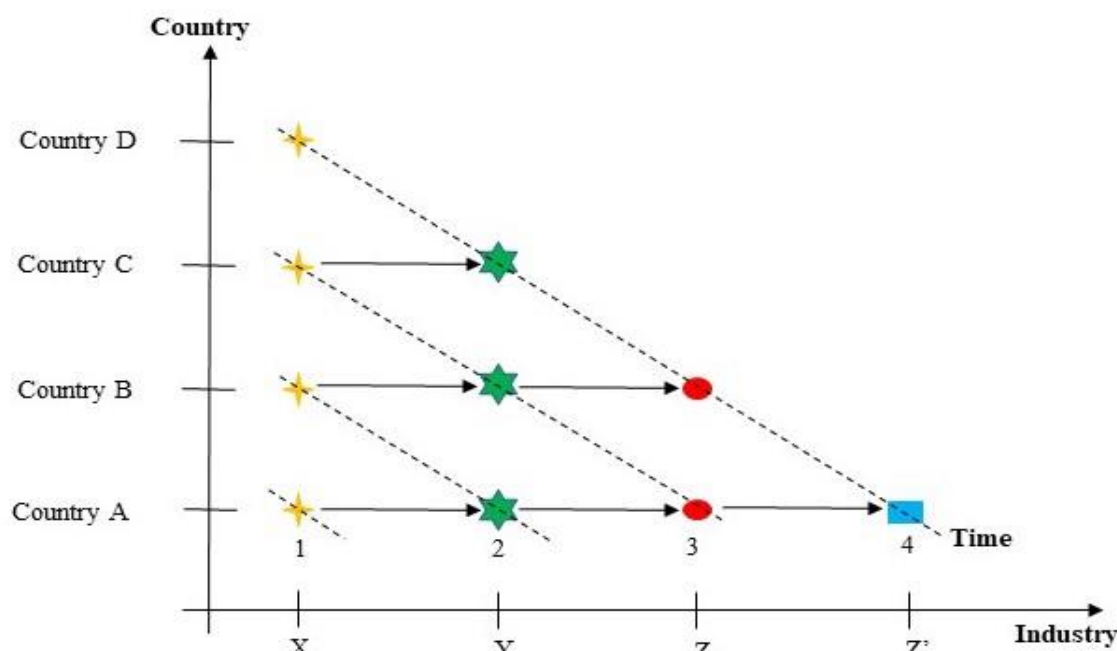
Figure 17: Investment Frontier. Adapted from "The "flying geese" model of Asian economic development: origin, theoretical extensions, and regional policy implications" by Kojima, K. (2000), *Journal of Asian Economics*.

There are two assumptions that are made here. First, the economy's industrial structure diversifies and upgrades sequentially over time from industry X (textiles and other labor-intensive goods) to Y (steel, chemicals and other capital-intensive goods), to Z (machinery & other capital/knowledge-intensive goods) (Kojima, 2000). This shift takes places horizontally. Second the FG pattern of industrialization is transmitted vertically through the PROT-FDI from country *A* (lead goose) to the follower geese (Country's *B, C* and *D*). The passage of time is indicated by the dotted lines. Here at period 1, country *A* graduates from the catching up process in industry X. At period 2, A achieves comparative advantage in Y-industry, and invests in country *B*'s X-industry through PROT-FDI. By period 3 country *A* upgrades its comparative advantage to Z-industry and invests in country *B*'s Y-industry and country *C*'s X-industry (Kojima, 2000). Hence it is through the method of the PROT-FDI investment frontier, that the spread of the industrialization takes place from a lead goose to the follower geese.

Model 3- Agreed Specialization: Let us assume two countries A & B each have demand for a good X, it will be uneconomical for both these countries to produce the good X to satisfy domestic demand due to lower economics of scale leading to a higher unit cost. If both countries were to come an accommodation, such that one country agrees to specialize in good X, and the other country agrees to specialize in a goof Y, then both these goods can be produced at lower unit costs due to larger economics of scale. *This is known as agreed specialization.* This is facilitated by FDI undertaken mutually in a PROT-direction. Agreed specialization can emerge in a regionally integrated group, which assures mutual liberalization of trade and investment.

Here in addition to the basic and variant patterns of the FGM, the Kojima Model 1 and 2 are of particular interest to my case and I will focus on these two models to draw policy recommendations for Sri Lanka's particular growth strategy. The significance of this theory is trying to understand

at what stage of the basic pattern described above does Sri Lanka stand, to understand the direction economic policy must take to bring about a structural change of the economy to prevent future debt crises. To get a bearing of the standing of Sri Lanka's economy, we carry out non-parametric analysis in the context of the FGM to understand trends in Sri Lanka's investment and savings as well as its current level of industrialization. As the results of the data analysis from the previous chapter has indicated, Sri Lanka has high elasticities in the industries of manufacturing, chemical and the clothing industries. Though these elasticities convey the potential of these respective industries in Sri Lanka, we cannot know whether Sri Lanka has a revealed comparative advantage in these sectors and what the trend is for in this parameter. We now first look at the level of industrialization, investment and savings, following which I will look at the Revealed Comparative Advantage (RCA) for these industries.

5.4 Level of Industrialization, Investment, Savings, the current account balance and the RCA

High speed economic growth in Asia was achieved through means of rapid industrialization. The paper by Kosai & Tho (1994) discusses several factors which led to this high-speed growth and shows the trends of certain parameters of several east Asian countries and finds that an increasing manufacturing sector contribution as a share of GDP has contributed to their high speed economic growth. The paper shows the rapid industrialization process of Korea during the period 1960-1990, which was the follower geese with Japan being the lead goose during this period. Japan already had reached a manufacturing as a share of GDP of more than 30% during this period. In the early 1960s Korea's manufacturing as a share of GDP was less than 15%, but grew rapidly the following years reaching a level of 25% after 1973 and reaching 30% just before 1985. This growth in Korea was then followed by the next follower geese of Thailand and Malaysia, which reached a manufacturing as a share of GDP level of 25% after 1988 & 1989 respectively. The next follower country of Indonesia has shown a rising trend in this category as well.

Hence, this paper showed the flying goose model of industrialization for some east Asian countries and the catching up process to the more advanced country of Japan, through means of increasing their manufacturing output. We now look at the trends during this period of 1960-1990 (figure 18) and then further onwards for the period of 1990-2016 (figure 19), for the major SAARC[7] group of nations to see whether exhibit a similar pattern/trend in their level of industrialization, to see whether this catching process has been initiated in this region.

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[7] The focus is mainly on India, Pakistan, Bangladesh & Sri Lanka since they represent the major economies in the SAARC region.
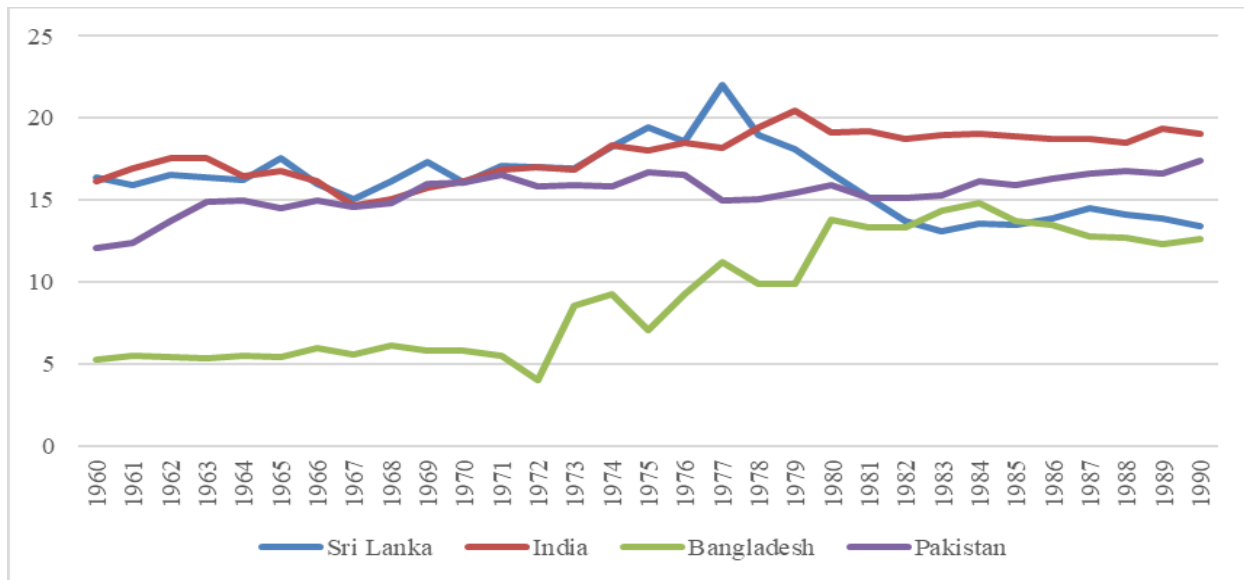
Figure 18: Manufacturing as a % of GDP (1960-1990) (World Bank Open Data, n.d.)

For the period shown above, we can see very diverging results from that exhibited by east Asian countries. In 1960 Sri Lanka and India both had higher manufacturing/GDP ratios than Korea, Thailand, Malaysia and Indonesia. While the latter countries have shown rapid rising trends in this sector during this period, Sri Lanka and the other SAARC countries have shown a somewhat constant trend, except for Bangladesh which shows an increasing trend reminiscence of a follower geese pattern, before tapering off after 1980. In Sri Lanka's case it does show a small peak during 1977, but surprisingly after this period Sri Lanka exhibits a decreasing trend till 1990, contrary to the pattern excepted if the flying geese model were to be observed in the economy. None of the SAARC countries have surpassed the 25% level in their manufacturing/GDP ratio that certain east Asian countries had achieved during this period.

If we were to assume that this was because the SAARC countries were late industrialization countries (follower geese), which would follow the pattern of the flying goose model in the years to come, we would assume to see a rising trend after the 1960-1990 period. But a look at the next figure for the manufacturing/GDP ratios for the period from 1990-2016, shows once again a somewhat constant pattern during this period as well, except for Bangladesh which shows a slight rising trend and by the year 2016, has a higher manufacturing/GDP ratio than Sri Lanka, India and Pakistan.
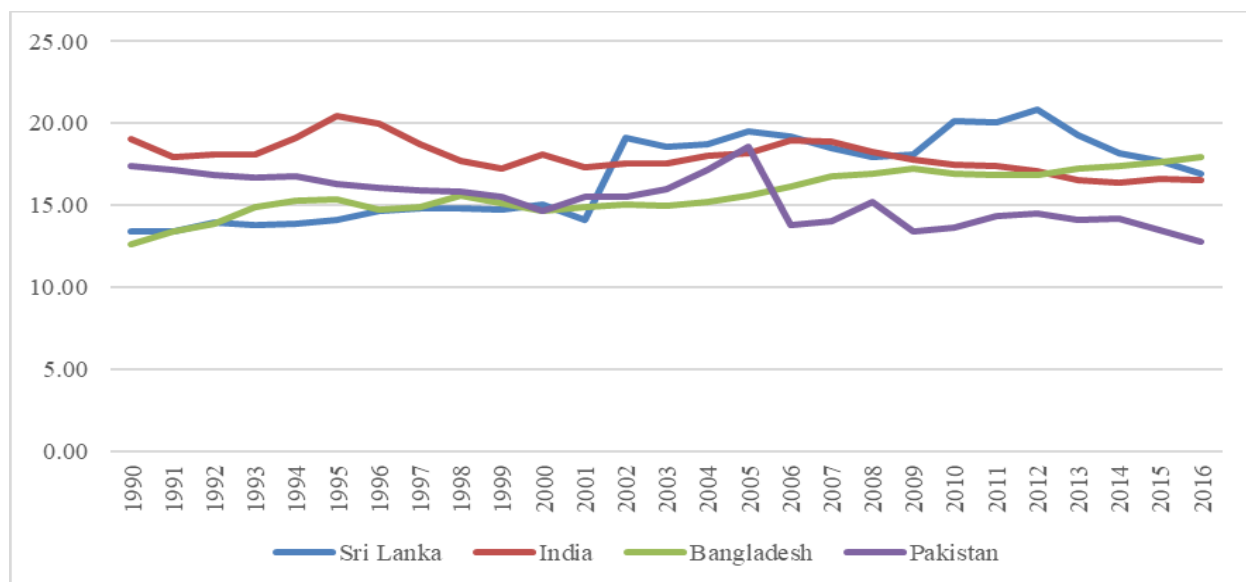
Figure 19: Manufacturing as a % of GDP (1990-2016) (World Bank Open Data, n.d.)

One major reason could be due to economic policies that were not actively targeted towards the industrial sectors. Since *PROT*-FDI and the investment frontiers described above in *Kojima model 2* are the channels through which the flying goose model works, we can conclude that either there wasn't sufficient FDI flow into Sri Lanka, or there was FDI flow, but not towards the high-income elasticity of export demand industrial sectors.

The paper by Kosai & Tho (1994), identifies three factors for high speed growth in east Asia in relation to the flying goose model. The three factors are 1) transformations in development policy, 2) the virtuous cycle of investments, exports and imports, and 3) regional externalities. The first and third factors will be discussed later on as they will form the basis for policy recommendations to come. We now look at the second factor in more detail.

The second factor of virtuous cycle of investments, exports and imports states that high growth rate in East Asia can be attributed to high level of investments and an outwards-looking industrialization policy. These countries which exhibited the FG model of economic development also experienced a high investment as a percentage of GDP ratio (Kosai & Tho, 1994). Kosai & Tho (1994) state that development economics advocate an investment to GNP (Gross national product) ratio exceeding 20% to be sufficient for self-sustaining growth and show that most of these east Asian countries exhibited this and some even exceeded the 30% mark. Hence a high investment ratio leads to rapid physical capital formation which is required for rapid economic growth (Kosai & Tho, 1994).

A high investment rate must be accompanied by a high savings rate. A high savings rate was a major feature of most east Asian countries and this was observed in Sri Lanka as well, since most of the investments was driven by domestic savings as shown in Chapter 2. During the initial stages of economic development of most developing countries, there are two prominent gaps that these countries face. One is the investment-savings gap (the investment) and another is in foreign exchange (current account balance). This because investments and imports of goods and services tend to be at a higher level than savings and exports for developing countries (Kosai & Tho, 1994).

The following figure shows the investment/GDP, domestic and national savings/GDP and the current account balance/GDP for Sri Lanka for a period of twenty years.
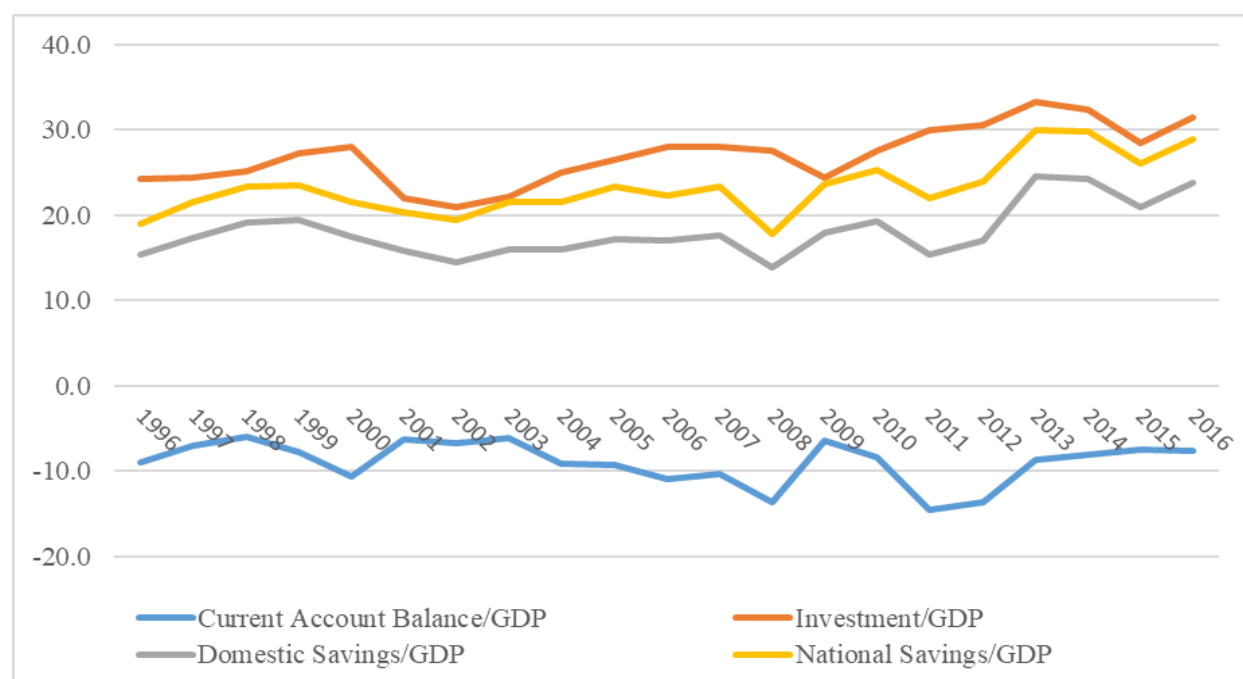
Figure 20: Investment, Domestic & National Savings, and the current account balance as a percentage of GDP (Central Bank of Sri Lanka, 2017)

The trend clearly illustrates that investment is dependent on domestic savings. Kosai & Tho (1994) show a similar trend for two east Asian countries (Korea and Thailand), where their investments were largely funded by domestic saving. These two countries also managed to reduce their investment-savings gap over a twenty-year period. The above graph shows this isn't case for Sri Lanka, which hasn't reduced the gap between its domestic savings and investment. Similarly, the current account balance which is the difference between the exports and imports hasn't closed yet as well, though it has shown a slight decrease in the last three years. The presence of a gap between investments and savings can only be filled by foreign aid, concessional loans and foreign direct investment (Kosai & Tho, 1994). In is interesting to notice as well that whenever the investment-saving gap increased, the current account balance increased as well. This is because the current account balance reflects the trade deficits which in turn reflects foreign savings as mentioned in chapter 2. As mentioned in chapter 2, increased investments leads to greater imports, leading to a greater trade deficit. Hence greater the investment-savings difference, greater is the trade deficit observed as well. Kosai & Tho (1994) further iterate the need for externally oriented policies to close these gaps, and that these foreign resources which are received for investments must be used efficiently to narrow and close the gaps between investment & savings, and reduce the current account balance as well, which the East Asian nations did overtime.

The FDI per capita for the SAARC region and China is shown below as well (figure 21). As can be seen from the figure, Sri Lanka shows a high rise in the FDI per capita, second only to China, with an increase of 500% during the period illustrated. Most countries show a decrease in FDI per capita during the period of 2008-2010, which was due to the 2007-2008 financial crisis. By far FDI per capita in China's economy exceeds that of the SAARC nations by a significant margin.
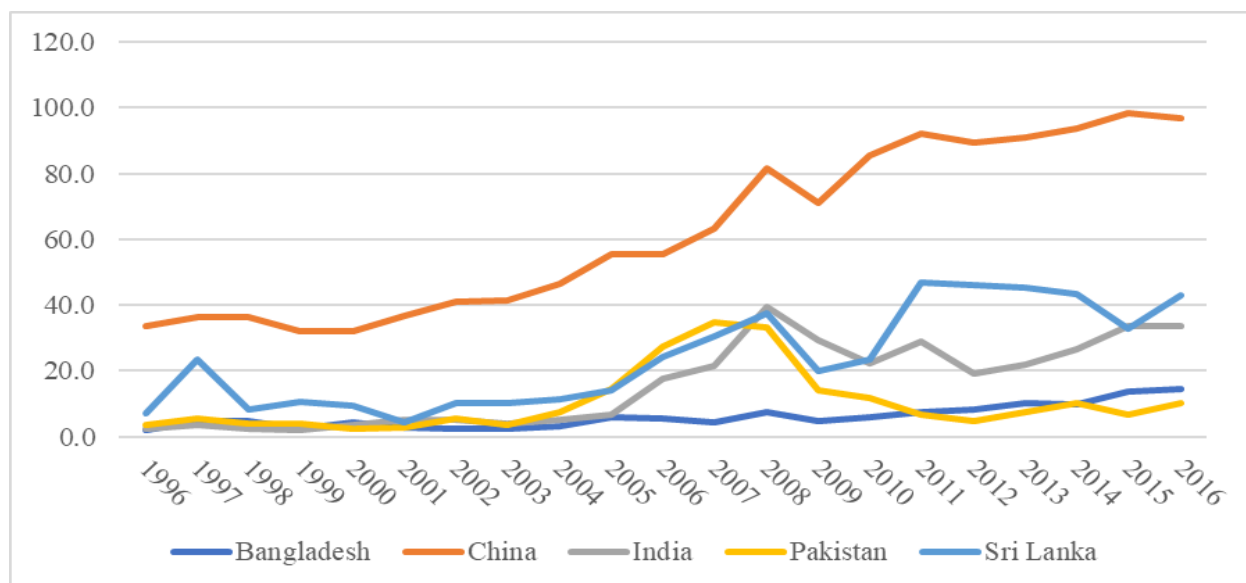
Figure 21: FDI per capita for SAARC members +China (UNCTAD, n.d.)

In terms of an outward-looking policy (export-oriented policy), Kosai & Tho (1994) show that the rapid increase in the trade dependence ratio (the ratio of exports plus imports to GDP) of some east Asian countries, was also a factor that led to the rise in east Asian economics. The trade dependence ratio shows to what extent trade (export & imports) compose annual GDP output. A high trade dependence ratio shows the important role the foreign sector plays in the economy through exports and imports. Kosai & Tho (1994) state that for the foreign sector to play a development role, the interaction of exports, imports and domestic investment must link together in a virtuous cycle. Imports supply the modern equipment needed to facilitate the expansion of domestic investment which in turn increases productivity and reduces production costs increasing competitiveness of the products, leading to an expansion of exports. Hence the factors of a high investment/GDP ratio and a high trade dependence ratio and essential components for implementation of the flying goose model. We shall now take a look at the trade dependence of the ratio for Sri Lanka. The figure below shows the trade dependence/GDP ratio for a period of twenty years (1996-2016).
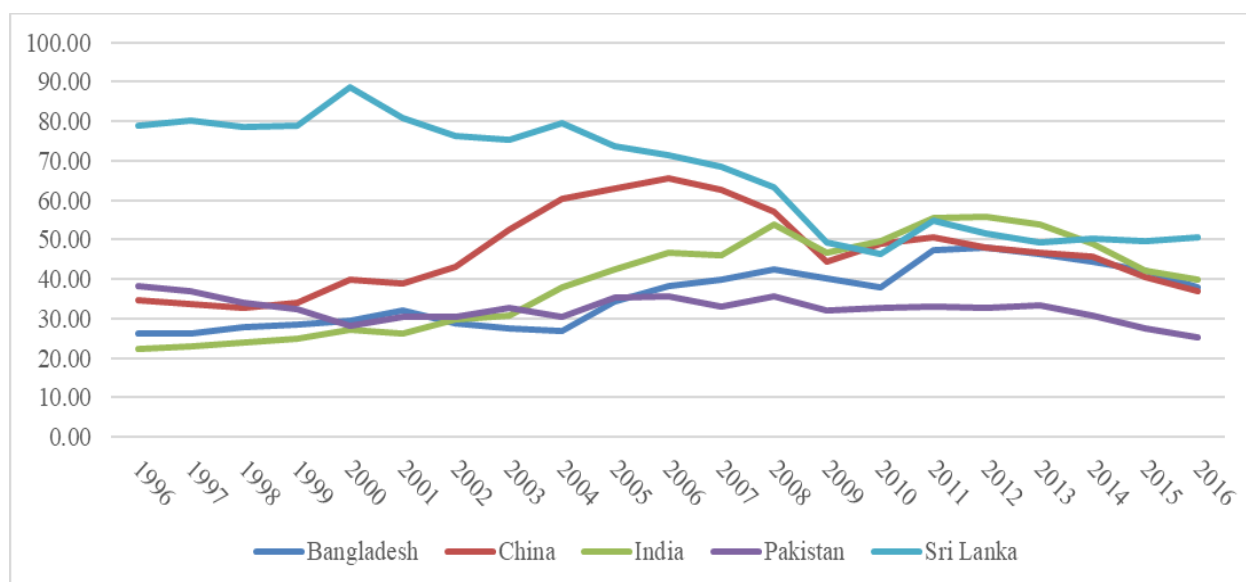
Figure 22: SAARC member's Trade Dependence Ratio (World Bank Open Data, n.d.)

Kosai & Tho (1994) state the trade dependence ratios of some east Asian countries during their high growth period. The trade dependence ratio for Korea rose from 32 in 1970 to 66 percent in 1988, with the ratio for Taiwan showing a high of 90% from 53% for the same period. This high trade dependence ratios are linked to the rapid economic growth these east Asian countries experienced. Looking at Sri Lanka's trade dependence ratio shows diverging results from that of the high growth Asian countries. Sri Lanka's trade dependence ratio has shown a gradual decline during the period of 1996-2006. At one point, Sri Lanka had ratio of almost 90% in this parameter, but in the last few years, has shown a ratio of only about 50% in this parameter. In fact, Sri Lanka's trade dependence ratio shows the greatest fall in the region including China, while some countries even showed a slight increase. Hence trade as a key driver of GDP has decreased over the last several years in Sri Lanka. This might be justified if Sri Lanka was a developed country. Raghuram Rajan in his book Fault Lines: How Hidden Fractures Still Threaten the World Economy (2010), state that countries which have had trade surpluses for a long time, like Japan and China, have to start looking inwards to improve their domestic markets to prevent inefficiencies and to increase demand, so that they need not be reliant on foreign demand. But Sri Lanka is still a developing country with trade deficits in the last twenty years, so this pattern of decreasing trade dependence is a divergence from developing economies.

Having a low trade dependence ratio can be detrimental from the point of view of the flying goose model since the model depends on the cycle of imports, domestic production and exports. One can argue that having a low trade dependence ratio can be interpreted as having low exports but also low imports as well which can reduce trade deficits. But the growth model of the flying goose model states that it is through imports that technology and knowledge transfer as well as productivity increases can occur in a selected industry, which will then eventually lead to an expansion of exports. Hence Sri Lanka has started looking inward rather than outward for their economic policies.

Hence as can be seen from the above figures and evidence, the Sri Lankan economy shows a high investment/GDP ratio with an increasing trend after 2007, as well as the highest FDI per capita in

the SAARC region. It also exhibits a low trade dependence ratio with a decreasing trend in the same period. What we can conclude from this these two parameters and the evidence presented above that investments and FDI has been trending in the non-tradable sectors rather than in the tradable sectors. This can affect exports, causing a foreign exchange crisis ultimately leading to an exacerbation of the current debt crisis, as well setting up the trap for future ones.

The annual report published by the Board of Investment for the year 2013 shows the sector-wise investments and FDI inflow in Sri Lanka[8]. This further proves the above conclusion that we have made from the evidence as well. Of the total investment projects approved in the year 2013, 78% went towards the infrastructure and services industry which consisted of shopping & office complexes, hotels, restaurant services & entertainment complexes and housing & property development. The percentage of approved manufacturing projects only consisted of 13.8% of the total investment projects. The manufacturing sector also surprisingly had the highest share out of the total FDI inflow, but this should be taken with a pinch of salt, since the manufacturing sector here includes the textile industry as well. One indication that FDI and investments were going towards the textile industry is the total employment created in the year 2013, which saw almost 60% of the new job creation in the apparel industry, while other manufacturing created only 12% of the jobs for the year 2013. This conclusion should also be taken with a pinch of salt, since the textile industry is a more labor-intensive industry after all. Another interesting point to note was that China had the highest contribution of FDI in Sri Lanka.

5.4.1 Revealed Comparative Advantage

Throughout the explanation of the theory on the Flying Goose Model, the term comparative advantage was constantly used. Here we explain more about what comparative advantage means in the context of the flying goose model and why it is important to get an understanding of how the FGM works. The relative comparative advantage of a country can be found by using the export share RCA index as given below (Dowling & Cheang, 2000),

$$RCA = \frac{X_{ik}}{X_{iw}} \bigg/ \frac{X_k}{X_w}$$

Where X_{ik}= country k's export of products of industry group i; X_{iw}= region's export of products of industry group i; X_k= country k's total exports; and X_w= region's total exports. The RCA index measures country k's relative strength in the export of products of technological group i in the region. Hence for a particular industry group, the RCA index shows by how much a particular country's exports in a given industry, composes the total exports of that country, compared to the rest of the region[9]. Country k is said to have comparative advantage (disadvantage) in producing and exporting products of group i if its RCA index is greater (less) than unity (Dowling & Cheang, 2000).

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[8] The 2013 report was used, since it was the latest one available by the Board of Investments. A more recent annual report could not be found. The conclusion made from this data should be viewed with a little skepticism since the composition could have undergone changes in the last five years.

[9] A simple example would be if Bangladesh's textile exports composes 30% of the regional textile exports, while its overall exports composes only 5% of the overall regional exports, then Bangladesh would have a RCA of 6.0 in the textile industry in the region.

The paper by Dowling & Cheang (2000) shows the trend observed in the RCA index for several industries in some east Asian countries, which demonstrate the shift of the comparative advantage from one region to the next. The paper shows how RCA indices shifted over time (over a 24-year period) from Japan (the more advanced country) to the NIE's and then finally shifted to the ASEAN countries for the textile, computer and electronic industries. Hence using the RCA index, one can better visualize the spread of the flying goose model of development. Kosai & Tho (1994) iterate how each country, following the flying goose model of development, builds comparative advantage over time from labor intensive industries to gradually more capital intensive ones. The intial industry that advancing countries lose comparative advantage to and that developing countries gain a comparative advantage in, is the textile industry (a labor intensive industry). Once countries gain a comparative advantage in this industry, they then start to upgrade their production structures over time to more high technology industries.

The following figures show the RCA index for the three industry categories of textiles, Machinery and Chemicals, which showed the highest income elasticity of export demand in the previous chapter for Sri Lanka's exports. The RCA index in calculated for the SAARC region with China included. The inclusion of China is attributed to several reasons. The first being that China is an economic power house and is in close geographical proximity to the SAARC region. The second reason being China has a huge presence in the three selected industries and it will be good to know whether relative comparative advantage has started to shift to the SAARC countries from China. This stems from the fact that Kojima (2000) identifies China as a recipient of recent Japanese FDI and gives it a position as country D in figure 2. While this paper was written eighteen years ago, it will be interesting to know whether comparative advantage has started to move away from China in certain industries.

The first figure below highlights the RCA index for the textile industry for the period 1980-2016. After 1994, the RCA index for Bangladesh, Pakistan and Sri Lanka shows a high rise in this category with RCA indexes greater than 3 for each country, with Bangladesh showing a high of 6. India and China show a RCA index close to 1 for this period. Hence in this region along with China, Bangladesh shows the highest RCA index for the textile industry followed by Pakistan and Sri Lanka showing that these three countries have obtained a considerable comparative advantage over China and India. It is important to note that having the highest RCA textile index doesn't mean that this industry is the most matured one in the region. All what the RCA index conveys is that, greater the index, greater is the composition of a particular industry's exports out of the total exports of that country with respect to the other countries in the region. Indeed, China's exports in textiles in 2016 composes 76% of the region's total textile exports (13% of China's total exports) while Bangladesh's textile exports compose only 9% of the region's total textile exports (87% of Bangladesh's total exports).
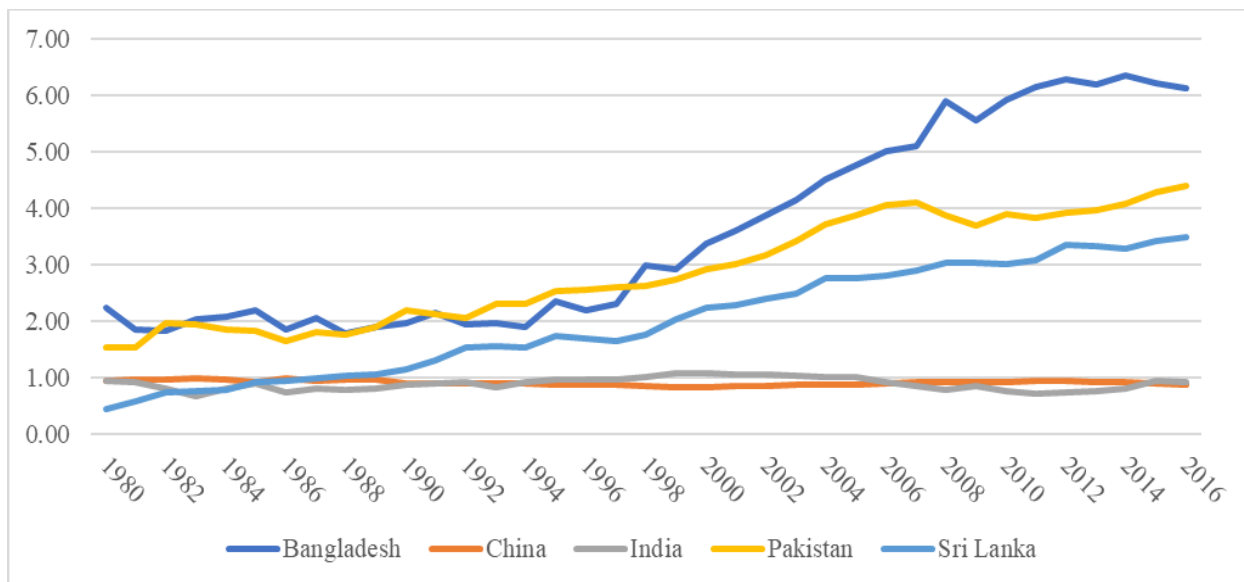
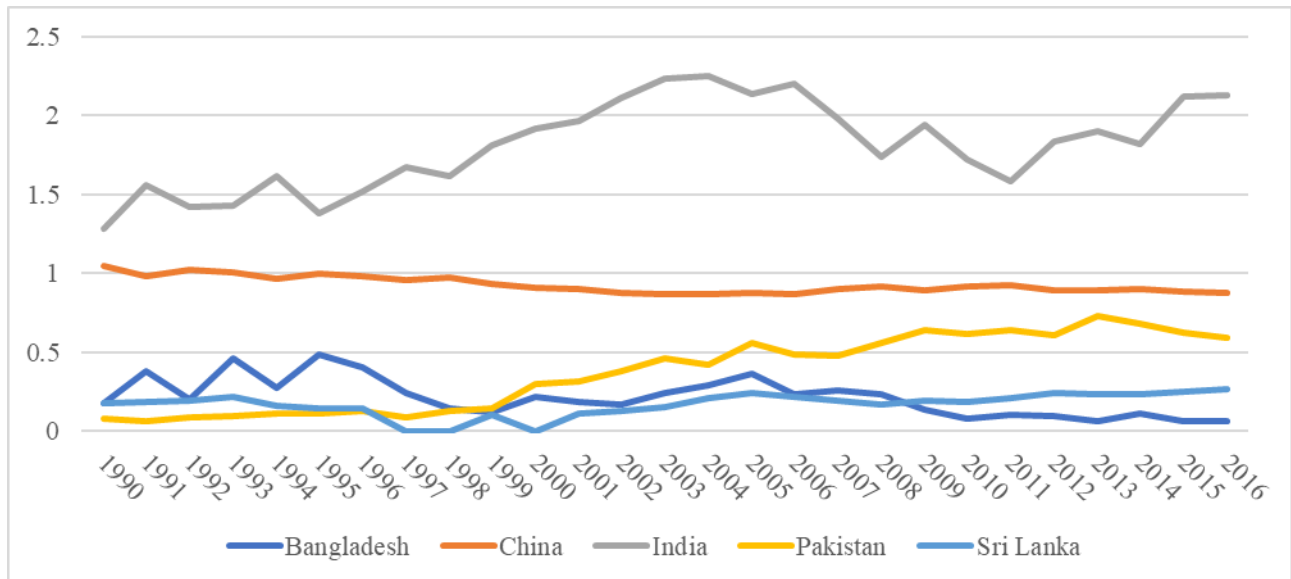**Figure 23: RCA index for the textile industry (Time Series-WTO, n.d.)**

The next figure below shows the RCA index for the machinery industry. It can be seen from the figure that China has an overwhelming advantage in the machinery industry with an index of over one, but it is interesting to know that the RCA index has been decreasing gradually in the period 1990-2016. All the other countries have a low RCA index in this category, with an index of less than 0.4, with India having the highest index of 0.4. This shows that though the RCA for machinery in China has started to decrease in this industry category slightly, comparative advantage has still not shifted over to the SAARC countries for this industry yet.
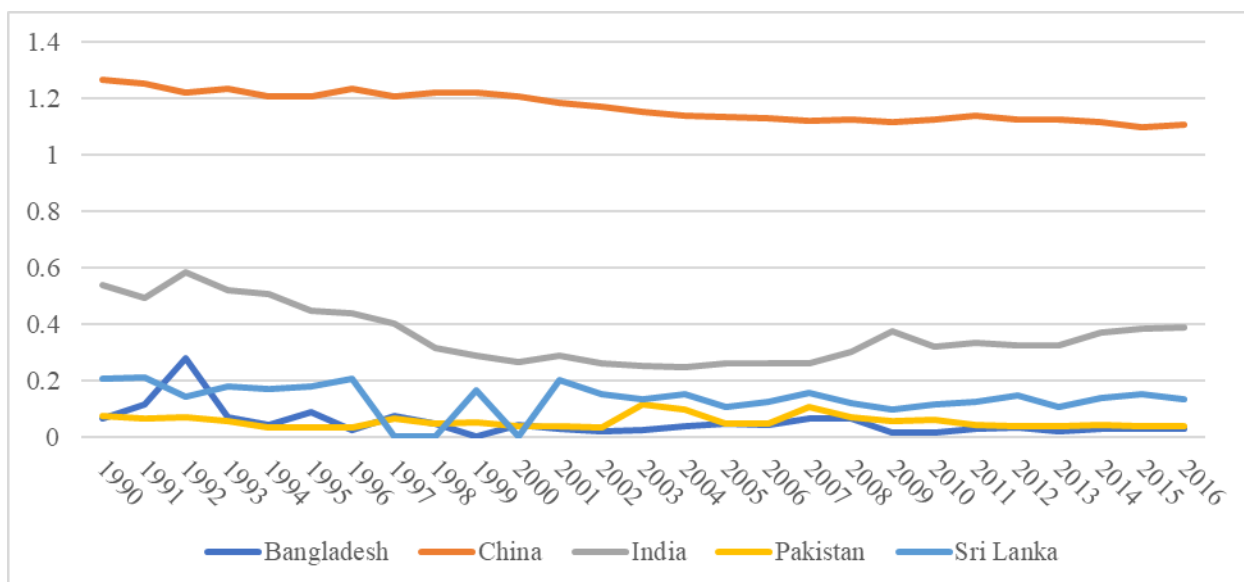
Figure 24: RCA index for the machinery industry (Time Series-WTO, n.d.)

The final figure below shows the RCA index for the chemical industry. Here India shows a high comparative advantage in this industry due to its well-developed pharmaceutical industry. China shows a gradually decreasing comparative advantage in this category with its index coming below 1, with Pakistan showing a rising trend. The RCA index for Sri Lanka and Bangladesh is below

0.5. Here, the RCA for the chemical industry show a slight shifting, since India has a high RCA index, while this index is showing a rising trend in Pakistan and a slight decrease in China. Sri Lanka and Bangladesh have not developed comparative advantage in this industry yet. Here its once again important to note that even though India has a high RCA in this industry, India's chemical exports compose only 23% of the total chemical exports in the region, while China has a 76% market share.

Figure 25: RCA index for the Chemical industry (Time Series-WTO, n.d.)

The significance of the RCA index is to understand what the current status quo is in terms of a country's production structure. As shown above, while India and China have still got a relative comparative advantage in the textile and clothing industry and haven't lost it yet, Bangladesh, Pakistan and Sri Lanka have rapidly started developing in this industry indicating the shift of comparative advantage in this industry. With China and India's rapid growth it is only a matter of time that these countries start offshoring production in these labor-intensive sectors to less developing countries as they move along the FGM to more high-tech industries. What we cannot predict is whether Sri Lanka has started to lose comparative advantage to Bangladesh and Pakistan. Though Bangladesh & Pakistan have higher comparative advantages in the textile industry than Sri Lanka, it can be seen from the figure above that Sri Lanka's RCA index for textiles has risen as well, though not as fast as the other two countries. With the figures showing low levels of comparative advantage in the machinery and chemical industries, we can safely conclude that Sri Lanka is at the start of the first level of the Flying goose model where countries specialize in labor intensive industries. Hence policies must be targeted to induce acceleration of the FGM of development so as to move the production structure of Sri Lanka towards more high technology and capital-intensive goods and build comparative advantages in these industries.

The theory of the flying goose model elaborated above gives a method of progression of how a developing country, which is trying to catch up to an advanced country, moves from labor-intensive industries to higher technology industries. The diagnosis carried out on Sri Lanka's economy, in the context of the FGM, has revealed the low manufacturing industry it has (figure),

as well its low comparative advantage in the machinery and chemical industry for the SAARC region plus China, while the high RCA index in the textile industry revealed its relative specialization in this sector. The diagnosis also revealed the decreased trade dependence ratio for the last 20 years in spite of an uptick in the FDI per capita in the country as well as a high investment/GDP ratio which led us to the conclusion that Sri Lanka's investment and FDI inflow has been trending in the non-tradable goods sector and it hasn't been pro-trade oriented, which is required for upgrading into more capital-intensive industries. With this evidence we can categorize Sri Lanka in the first stages of the FGM of development. This because of its reveled comparative advantage in textiles, which is the initial industry developing countries get specialized in when undergoing the catching up process (Amsden, 2001). Hence the recommendations that follow in the next chapter will look at how Sri Lanka can accelerate this progression of the FGM of development with relevant economic policies while under the constraint of the current debt crisis with the objective of preventing future ones.

6. Policy Recommendations, Reflections & Conclusion

This Chapter is divided into three parts; Recommendations, Reflections & Conclusion. Before I go into recommendations I will give an overview of, and iterate what has been said in the previous chapters and will tie back to all the information and figures presented before, so as to give a better and clearer understanding of what has been done and the direction this thesis is proceeding in. The recommendations then follow and will focus on economic policies which advocates trying to change the structure of Sri Lanka's economy, keeping in mind the constraint of the current debt crisis, so as to prevent future debt crises and to make the economy resilient in the face of global shocks and development. The conclusion will then finally answer the objective and the research questions.

As I have said in Chapter 1, Sri Lanka suffers from a debt crisis, which was brought about by rapid development following the end of the almost 30-year civil war. This massive debt brought about along with it regular interest payments, which at one point the Sri Lankan government could not pay off, prompting assistance from the International Monetary Fund (IMF) to avoid a default. The provision of this assistance came with terms and conditions by the IMF which focused on heavy fiscal consolidation along with a strict inflation targeting monetary policy. While these solutions may save Sri Lanka from its current debt crisis, there is no structural change to the production structure of Sri Lanka's economy being advocated to prevent future debt crises, and there are inherent risks in carrying out fiscal consolidation with a tightened monetary policy as well for GDP growth, which were highlighted in Chapter 2. Even though optimism after the war was reflected in the Sri Lankan stock market index (figure 2) we can see that this did not directly translate to rapid economic growth for the general population (figure 3).

In order to reduce the debt burden, every country has to do its best to earn as much foreign exchange as possible, and this is possible only though means of having a trade surplus, where countries export more than they import. Hence countries have to orient themselves to an export focused production structure and this wasn't the case with Sri Lanka. As we have seen from Chapter 2 the graphs and trends show Sri Lanka's current economic standing in terms of its national accounts as well as its current production structure. The figures in chapter 2 clearly illustrate the growing trade and budget deficits that have been present for the last few years (figures 5 & 8), putting a burden on foreign exchange reserves. From Figure 9 we could also see that this burden was somewhat lifted by the influx of migrant remittances which have been growing as well. While these considerable remittances can be considered as a windfall for the Sri Lankan government, it has not been used productively.

The figures also clearly show the production structure of the economy, with the major industries that compose Sri Lanka's exports and import sectors. We could see from figure 10 that Sri Lanka's exports were considerably dependent on agricultural output and on the textile and clothing industry with a small portion dependent on industrial exports. There are problems with being dependent on the agriculture industry, since its output is dependent on the weather, its goods are perishable and is exposed to diseases, and finally it does not belong to the increasing returns to scale sector, like

the manufacturing industry does. The textile industry as well belongs to the labor-intensive industry, which does not require a lot of know how in this field and is a low technology industry. It is interesting to note that out of total imports, investment goods compose only 27% of all imports (figure 11). Hence Sri Lanka's production structure falls under the low-quality activities in the Quality Index of Economic Categories created by Erik Reinert. Some of the characteristics of this low-quality activities are that it has low market value, little technological progress, low wage level, low growth in output, low R&D content and flat learning curves (Kattel, Reinert, & Suurna, 2009). Hence, we can see that an economic structure concentrated on low quality activities will always have trouble building up trade surpluses and being competitive in export markets.

While Sri Lanka's GDP per capita has grown steadily as seen in figure 3, this growth came in tandem with growth in trade and budget deficits adding to the debt and foreign exchange burden due to increased imports. So, we were eventually forced to ask the question: is it possible for a country to grow rapidly without adding to the foreign exchange & debt burden while maintaining balanced trade in exports and imports? To answer this question, I turned to the theory of Balance of Payments Constrained growth developed by Anthony Thirlwall in 1979 which explains the difference in international growth rates. In essence, what Thirlwall's Law (defined as the product of world income elasticity of demand for Sri Lankan exports and the growth in world income divided by the Sri Lankan income elasticity of demand for imports) tries to find is a maximized growth rate, which ensures that there is a balance of trade, that is, ensuring that exports and imports are equal without running deficits or surpluses. When the actual growth rate of the country exceeds the one recommended by Thirlwall's law, it can only be done by running a deficit on its balance of payments, and when the actual growth rate is below the recommended rate, surpluses are built by the nation over time. This Thirlwall's law which was given by equation 12 in chapter 3 was then extended by Araujo & Lima (2007) to include the various industry sectors, and to calculate the growth rate by including the *weighted world income elasticity of demand for Sri Lankan exports & a weighted Sri Lankan income elasticity of demand for imports*. These elasticities were found using equations 7 & 8.

This resulted in the formation of equation thirteen which was termed as the Multisectoral Thirlwall's Law (MTSL). Hence to calculate this MTSL growth rate, the two above mentioned elasticities were estimated to identify which industries had a high potential for growth for the Sri Lankan economy to grow fast as possible. The main aim of trying to identify these industries is that, when one of Sri Lanka's export sector has a high world income elasticity of demand for Sri Lankan exports, it will be possible to have a high MTSL growth rate, that is a high growth rate where balance of trade is ensured, given that a large share of the exports comes from this high elasticity sector. Using regression analysis, I found the three industries with high income elasticity of demand for exports. These industries were Machinery, Chemicals and Clothing, with other manufacturing a close fourth. Once the elasticities were found, the MTSL growth rate was calculated (average and for the period 2001-2016). The average actual growth rate was found to be 0.89 percentage points higher than the growth rate recommended by the MTSL, which means that the Sri Lankan economy was able to grow faster than the MTSL growth rate by means of running trade deficits and accumulating debt. The MTSL growth was also less than the actual growth rate during the period 2007-2016 (figure 15) as well, and the results were in line with the growth of accumulated debt and increased interest payments we saw in figure 6 & 7.

Hence to increase the MTSL growth rate, so that Sri Lanka can grow faster while ensuring balance of payments without running deficits, Sri Lanka has to increase the export share of the high elasticity industries. This leads to the second question of "how can Sri Lanka shift to industries with high income elasticities of demand (manufacturing industry)?" To answer this question, I turned to the rapid growth that east Asian countries experienced in the 1990s and the flying goose model of growth that they adopted. The flying goose model and its extended Kojima extensions, talked about the cycle of imports, domestic production, and exports (the need for an export-oriented trade focus), and the importance of diversification and rationalization stages in an economy as well as having a pro-trade oriented foreign direct investment. In line with this model I studied certain patterns to understand the concepts just described.

We saw from figure 18 & 19 an almost relatively unchanged manufacturing goods as a percentage of total exports for Sri Lanka and from figure 20 that Sri Lanka's investment as a percentage of GDP was well above the recommended level, and a large part of it was funded by domestic investments with the rest from foreign transfers, FDI, loans (also look at Table 1 & 2) etc. Figure 21 also showed that the FDI per capita for Sri Lanka had increased during the period 1996-2016, and at the same time, we observed from figure 22 that Sri Lanka's trade dependence ratio had decreased significantly for the same period. This led to the conclusion that the FDI flowing into the Sri Lankan economy wasn't necessarily pro trade oriented FDI, since this would have brought about changes in the trade dependence ratio, which is a key factor required for rapid economic growth by means of the Flying goose model, but rather FDI was shunted into non-tradable activities. While non-tradable activities like tourism generate revenues, they do not generate new industrial knowledge which is required to build a stable economic foundation. Finally, a look at the RCA index showed us that Sri Lanka's economic production structure was at the start of the first stage of the FGM due its high revealed comparative advantage in the textile industry (figure 23) in the SAARC region, with a low comparative advantage in the more technology driven sectors of machinery and chemicals (figures 24 & 25). It was also interesting to note that the RCA index had been relatively unchanged in the last twenty-six years for the machinery and chemical industries, while the labor-intensive industry of textiles has shown a gradual increase in the same period.

Hence the above discussion clearly illustrates the direction in which economic policy for Sri Lanka has to go in. From the MTSL growth rate deduction we know that Sri Lanka's economy must traverse in the high technology manufacturing category to build more export share in this sector and grow more rapidly without building up deficits. This transition can be brought about by the FGM, where we found that Sri Lanka is in the initial phases of this model, where it has built up specialization in the textile industry. We also found that there are factors which might slow this transition by means of FDI flowing into non-tradable sectors resulting in a reduced trade dependence ratio. Hence economic policies must target speeding up the FGM of diversification of industries and building comparative advantages in these sectors and remove barriers that are present which prevents natural diffusion of technology as well.

6.1 Policy Recommendations

As seen from the discussion presented above, the recommendations that are to follow will go in the direction of upgrading the current production structure of Sri Lanka. Hence industrial policy is

paramount to achieving the goal of a more economically sustainable and inclusive growth path (Amsden, 2001) (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). Industrial policy takes a holistic approach considering macroeconomic factors, technology and sectoral policies. These policies also focus on diversification within and across sectors, rather than specialization since they were found to be the key drivers of income growth in low income countries. The scope of industrial policies was defined according to the unique economic conditions of each country. In contrast to financialization in advanced countries, developing countries in east Asia focused on industrial policies which brought about growth across the region along with a rise in trade surpluses and improvement in their debt profiles (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). There can be three types of industrial policies (UNCTAD, 2016). First, functional industrial policies, which is aimed at improving the working of the market. Second, horizontal industrial activities, which promotes activities across sectors. Finally, third, the selective industrial policies, which improve certain activities or sectors. Hence the focus will lie on selective industrial policies since the diagnosis has revealed from Chapter 4 & 5 that Sri Lanka must upgrade its production structure by moving to higher value added and higher technology sectors.

An argument in support of choosing selective industrial policies lie in the comparative advantages. The UNCTAD (2016) module on industrial policy making states that, policy should first focus on industries that have a comparative advantage, and only when they have accumulated sufficient physical and human capital should they upgrade their industrial policy and target higher productivity activities. This is an argument in favor of first developing comparative advantage conforming industrial policy. This is because implementing comparative advantage-defying policies prod developing countries to move into heavy capital-intensive industries which requires a lot of scarce resources. The counterargument for this is that developing countries which often have an abundance of cheap labor will have comparative advantage in labor intensive industries, and these industries cannot act as engines of sustained economic growth and as entry points into more advanced technological and skill related activities. Hence industrial policy is about building new comparative advantages by creating entirely new sectors and industries rather than following static comparative advantages (UNCTAD, 2016). This is especially true for the case in Sri Lanka, where it has a high RCA for textile exports in the region, but Bangladesh has a higher RCA for the same labor-intensive industry. Hence just focusing on its own specialization without striving to build new ones will affect the competitiveness of Sri Lankan exports in the long run. Diversification into new export sectors ensures that not all eggs are put into a single basket.

Manufacturing is the common target of industrial policy (UNCTAD, 2016) and good policy is required to increase Sri Lanka's manufacturing profile. History has shown that countries without robust manufacturing and sufficient industrial diversification tended to fall further behind. Countries progress from by first gaining manufacturing experience in goods such as textiles and foodstuffs and then later moving on to mid-technology and high-technology sectors (Amsden, 2001). Amsden (2001) defines economic development as a process of moving from a set of assets based on primary products, exploited by unskilled labor, to a set of assets based on knowledge exploited by skilled labor. This transformation is said to involve the moving away of capital, human and physical, from rent seeking agriculture, and into manufacturing, which is the core of modern economic growth. Amsden identifies manufacturing experience as a key component for knowledge-based asset formation. Here manufacturing experience does not include engaging in processing a single product such as petroleum or textiles, but rather engaging in different

industries. Hence this manufacturing experience is linked to learning-by-doing. Hence diversifying into new manufacturing sectors is paramount for Sri Lanka in order to gain the manufacturing experience necessary for knowledge-based asset formation. In addition, manufacturing experience leads to a self-fulfilling prophecy, since past manufacturing experience creates high expectations among potential new investors that future manufacturing activity will succeed (Amsden, 2001).

Salazar-Xirinachs, Nübler, & Kozul-Wright (2014) also state in their book *Transforming Economies* how no country has made the journey from widespread rural poverty to industrial wealth without employing targeted and selective government policies to modify its economic structure. They also iterate the key role a proactive state plays in technological upgrading and in accumulation of capabilities as well as in bringing about policies to promote structural and technological transformation. State intervention is seen as key to the rapid growth of the east Asian economies and in implementing selective industrial policies, and as a developing nation, state intervention is required in Sri Lanka's case as well. The success of Japanese growth is also attributed to the what is called "administrative guidance", a type of state intervention. This is the Japanese tradition where the government uses its influence to persuade firms to behave in certain ways, and firms accept this leadership due to the recognition that the government has superior knowledge and experience than that available to ordinary firms, and the sharing of values and beliefs (Singh, 1997). This system can work only due to Japan's unique demographic and the chances of successfully emulating this system of governance is unknown for Sri Lanka's case. Hence some of the major recommendations and instruments described below are the best way to go about achieving a change in the behavior of firms and households in Sri Lanka through state intervention while promoting growth in targeted sectors, through means of a selective industrial policy.

- **Higher Investments in Strategic Industries:** As we saw in Chapter 5, high investments (a high investment to GDP ratio) has been found to be one of the key elements for the rapid growth of east Asian countries (Storm & Naastepad, 2005) (Singh, 1997) (Kosai & Tho, 1994) (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014) (Amsden, 2001). Inducing high investment in favored industries was the way that Japan & Korea achieved rapid industrialization. High rates of investment lead to faster technical progress, greater learning by doing, and through a virtuous cycle to greater competitiveness and faster economic growth (Singh, 1997). As seen in Chapter 5, while Sri Lanka exhibited a high investment ratio like the high growth east Asian nations, these investments were not funneled to the strategic industries of high technology manufacturing and chemicals (as seen in the Board of Investment report of 2013). While it is true that these strategic industries face market uncertainties, these uncertainties are reduced due to the road map created by already advanced countries (Amsden, 2001).
- **Tightening Monetary Policy:** Reducing the investment-savings gap, while maintaining high investments is important as well, which we mentioned in Chapter 5. A high savings ratio results in the accumulation of capital. Sri Lanka has shown this high savings ratio in recent years as we saw in Chapter 2, since a greater proportion of investments were funded through domestic savings. A higher interest rate could lead to more savings in Sri Lanka, curbing consumption, and reducing the burden on imports while at the same time reducing credit growth to prevent inflation as recommended by the IMF. But at the same time a selective monetary policy should be advocated, which targets budding industries

(industries which show a high-income elasticity of export demand) through low cost loans and that can increase the diversification of Sri Lanka's export structure (exemption of selected industries from high interest rates). In this way, credit growth is ensured for industries with high export potential, which will be beneficial to the Sri Lankan economy in the long run, while keeping inflation in check and reducing credit growth in other undesirable areas. Hence this recommendation ensures that IMF policies are followed to get out of the current debt trap, without sacrificing long term growth. Hence having a high interest rate also induces higher savings while reducing undesirable investments and curbing inflation, but exemption of certain favored industries from high interest rates will enable funds to be channeled to these budding sectors.

- **Concessional Loans:** The above low interest loans for targeted industries are called concessional loans[10]. These loans are essential to induce investments in targeted sectors rather than in undesirable sectors such as housing as mentioned above in chapter 5. Concessional Loans were achieved in east Asia through means of government owned development banks. Development Banks are another factor that were observed in post war East Asian countries that contributed to rapid growth (Amsden, 2001) (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). These banks lent to export and import substitution-oriented industries that improved the balance of payments. Development banks lent credit to firms in these targeted industries at below market level interest rates (at concessionary terms). Even in countries where development banks were not prominent, the governments steered the whole banking sector to provide long term credit to targeted industries (Amsden, 2001). In Sri Lanka's case there are already the presence of state owned banks like the Bank of Ceylon, the National Savings Bank and People's Bank. Sri Lankan policy makers should utilize these banks as tools to better allocate capital to specific industries as well as try to steer the banking industry in trying to allocate more capital to strategic industries rather than in uneconomical sectors.

- **Development Banks:** Development banks also influence the efficiency of the firms they invest in through means of performance standards related to firm level management practices, which were called techno-standards. Amsden (2001) calls it the "reciprocal control mechanism". Hence firms had to comply to stringent parameters (based on finance, administration, technology, environment etc.) put forward in contracts. These banks monitored these firms' performance based on these parameters and further loans were contingent on fulfilling the terms of the contract. Stringent appraisals of the project and the client were undertaken and, in some examples, like in the case of the Korea Development Bank, the bank funded only part of the project's cost ensuring that clients shared part of the cost to induce performance-conscious behavior in them. In other cases, like in India, the banks nominated a director to the company's board to exert discipline in the firms. Such draconian rules were required to prevent capital being tied up in inefficient projects (Amsden, 2001). This ensures loans are used appropriately, while keeping overall credit growth in check. Hence the state, through means of the development banks, can take an active role in promoting growth of favored industries while at the same time keeping a firm grip on the trajectory of this growth as well.

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[10]The OECD defines concessional loans as "loans that are extended on terms substantially more generous than market loans. The concessionality is achieved either through interest rates below those available on the market or by grace periods, or a combination of these. Concessional loans typically have long grace periods" (OECD, n.d.).

- **National Leaders:** The creation of national leaders is key to rapid growth as well. Amsden (2001) highlights the instruments that are were used for the creation of national leaders through which there was a concentration in the intermediate assets allocated by the government. Some instruments that were used were industrial licensing, setting performance standards and profit distribution (which influence firm structure). Singh (1997) iterates as well how national leaders were chosen in Korea and Japan, in certain favored industries. Japan reinforced this through its usage of "administrative guidance" as explained above. If intermediate assets were to be allocated to a relatively large number of firms, through means of diffusionist policies, greater the difficulty in creating national leaders with proprietary and cutting-edge skills (Amsden, 2001). Amsden (2001) iterates how governments often won't let national leaders fail, but did allow their owners to go bankrupt leaving the production capacity intact and transferring ownership rights to other entities circumventing the moral hazard of becoming too big to fail. Hence concentration of a country's assets in a few selected firms can be used to accelerate the learning process and advancement in technology, ensuring reduced failure, and this strategy is useful when there is a dearth of resources.
- **Policy Standards (1):** Amsden (2001) also talks about policy standards in contrast to the techno-standards, which relate to export goals and localization of production. Governments often provided firms with subsidy packages which consist of duty free imports, tax rebates and sometimes protection of the domestic markets through tariffs. But these subsidizes were contingent on meeting certain export targets. In some cases where export processing zones were concerned, the requirement was to export 100% of the output. Such measures were necessary to ensure that there will eventually be balance of payments. Export processing zones also helped create more employment which in turn helped expand the domestic market for manufacturers. An example was Korea, which induced firms to become more export oriented, by making subsidizes contingent on achieving export targets. Firms which were poor performers (that couldn't meet these conditions) stopped receiving subsidizes. Foreign firms too had conditions to fulfill export targets if they wanted to expand capacity. While these measures seemed harsh, it was necessary to eliminate inefficiencies in handing out subsidizes. It is not relevant here to follow the same format. Sri Lanka does possess export processing zones, but it is not paramount to impose harsh export conditions on all manufacturing industries. Strict export targets can be imposed on industries where specialization has already been built, like the textile industry, while budding strategic industries could be exempted. For example, in industries identified for import-substitution, firms could be offered the same subsidizes as well, since the foreign exchange lost in duty free imports to these industries is made up for a fall in the imports of the finished goods in the same industry. Hence these firms produce finished goods for the domestic market, while at the same time gain manufacturing experience in these industries. Duty free imports for strategic industries also play a valuable function, since according to the FGM as mentioned in chapter 5, it is through imports that technology and knowledge transfer occurs in these industries. Overtime once production for the domestic markets becomes saturated, export goals can then be enforced.
- **Policy Standards (2):** High import tariffs on luxury goods and other non-essential consumer goods will increase savings as well. This will lead to a higher savings ratio by households by reducing their consumption, which can help bridge the investment-savings gap, while at the same time reducing the current deficit by reducing imports, given Sri

Lanka's relatively high-income elasticity of demand for imports as estimated in Chapter 4. Business savings is key too, to reduce the investment-savings gap. When the above recommendations of concessional loans and subsidizes are implemented, this will enable an increase in the profitability and the business savings in these strategic industries (Storm & Naastepad, 2005). Higher profits were converted to high savings due to a higher profit retention rate in East Asian firms, which was due to its corporate financing system where profits are retained for investments rather than paid out as dividends, and as well as due to the insignificant role of the stock market (Storm & Naastepad, 2005). This discipline can be emulated by means of enforcing a higher dividend tax which will induce listed firms to reinvest rather than payout dividends. This goes for publicly listed banks as well. Through this the state can mobilize the banking sector in Sri Lanka to invest in strategic industries as well. This higher dividend tax in conjunction with import tariffs will enable accumulation of savings. Import controls should be used where possible to foster domestic production and protection of strategic industries as well. This must be done correctly in order to not run afoul of WTO regulations and destroying foreign relationships (Amsden, 2001).

- **Pro Trade Oriented FDI:** A selective pro trade oriented FDI as recommended by the Flying goose model in Chapter 5 is important. FDI must flow into industrial sectors which produce tradable goods (as opposed to non-tradable activities that we observed for Sri Lanka) and which have high income elasticities of export demand to give a boost to these infant industries in Sri Lanka in order to build comparative advantage in these sectors, and increase trade flows (Kosai & Tho, 1994) (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). Governments play a key role in trying to attract more pro-trade FDI to flow into these targeted sectors, by implementing the above recommendations which highlight the importance of concessional loans and subsidies and offering other benefits such as tax exemptions, reducing restrictions, controls and bureaucratic procedures which should attract potential investors, making the targeted sectors more attractive to them so as to follow the FGM of development. Another key strategy is to attract a renowned international firm in each of the targeted sectors, which can work as a signal for other firms (UNCTAD, 2016). Kosai & Tho (1994) & UNCTAD (2016) also mention that it is through FDI, which is not just capital, that technology transfer and knowledge spillovers also occur in low income countries. Hence it is through FDI that new technology and means of production can infiltrate these infant industries. It is only through FDI can developing countries gain the technology capabilities that is already prevalent in developed countries. While there are several types of FDI, the main types of FDI applicable to Sri Lanka is the resource and efficiency seeking FDI, which relate to exploiting a host country's low skilled or specialized labor, and making use of the country's low costs of productions and economies of scale (UNCTAD, 2016).

- **Building Capabilities:** Salazar-Xirinachs, Nübler, & Kozul-Wright (2014) mentions that one of the factors required for catching up is the strengthening & building up of capabilities. Hence learning is essential for building up of dynamic capabilities and of a skilled workforce, to manage structural and technological transformation. It is the capabilities that decide what products and technologies that economies and firms can develop (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). While at the start we have mentioned manufacturing experience, gained through upgrading, is an element of learning, other strategies to enhance learning are greater education policies to promote learning at different

levels and places- in schools, in enterprises, social & organizational networks etc. In addition to this, technical vocational education and training is essential for the accumulation of skills and upgrading to more technologically advanced sectors. This was observed in South Korea which implemented education and training policies during its period of rapid industrialization (UNCTAD, 2016). The education policies were intended to assist industrial policy in structural transformation. The education & training policies were gradually upgraded in South Korea through the different phases of the country's industrialization. During its entry into heavy and chemical industries, the focus was on expansion of technical, vocational and primary education. When the focus turned towards knowledge based and then high-tech industries, expansion of education policies took place in middle school education and then expansion of graduate programs at the university level (UNCTAD, 2016). Hence the establishment of any high-tech manufacturing industry requires the presence of highly skilled labor, through means of better education. Consequently, to realize returns from a higher investment/GDP ratio the need of a skilled and educated labor force is paramount (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). Salazar-Xirinachs, Nübler, & Kozul-Wright (2014) iterate that high performing economies looking to move into "high quality activities" (higher productivity, economics of scale etc.) look for the state to provide conditions conducive for learning. Hence the implementation of an industrial policy and catching up through the FGM of development as mentioned in Chapter 5, will not have any profound effect without the implementation of policies that target learning and education in parallel. Hence Sri Lanka must undertake the necessary steps to induce a learning environment with greater investment in all levels of education (primary, secondary & tertiary) and promoting training, targeting specific skills mismatches in targeted sectors to build a more skilled workforce to see its industrial policies come to fruition.

- **STI Policies:** The last recommendation is also the least feasible one in terms of timeline and the resources needed along with the current constraint of the debt crisis. This deals with Science, Technology and Innovation (STI) Policies, which according to UNCTAD (2016) goes hand in hand with industrial policy. Hence industrial policy complemented by innovation policies tend to stimulate R&D within firms. This is the least feasible for Sri Lanka to enact since STI policies have high costs, since innovation requires significant financial resources. This is due to the uncertain nature of the innovation process, and also due to requirements such as the need of skilled labor, human development and state capacity. Hence attracting the right type of FDI is paramount since it is through FDI that technology transfer can occur for developing countries. For innovation policies to work, firms also need the capacity to absorb knowledge which only comes from manufacturing experience. UNCTAD (2016) states that in countries with limited financial and human resources, governments can play a role through means of setting up government-supported research institutes (GRIs). These GRIs can undertake research in specific industries or have a much larger focus. In the first case, research leads to greater commercialization and collaboration with private firms, which can also lead to dissipation of knowledge for local firms, while in the second case research output is less oriented towards commercialization. But then again this can only be undertaken when the targeted industries have taken root, and then GRIs can be established to accelerate the learning process within the targeted industries. Hence innovation policies can come to the fore slowly, as Sri Lanka achieves greater industrialization.

Hence these recommendations go hand in hand with the diagnosis of Sri Lanka's problems that has been done in the previous chapters. While industrial policy covers a wide variety of issues, the recommendations given above should form the core of any selective industrial policy for Sri Lanka. These recommendations ensure shunting of resources, capital and human, towards more desirable sectors which have greater export potential. The need for a comprehensive industrial policy is paramount, since according to Salazar-Xirinachs, Nübler, & Kozul-Wright (2014), as income rises, the rising labor costs can affect the competitiveness of labor intensive manufacturers, which the Sri Lankan economy is currently dependent on. Hence, selective industrial policy, should focus on building up strategic industries which can help raise the MTSL growth rate through means of accelerating the flying goose model of development. It should aim to improve Sri Lanka's RCA index in these strategic sectors and increase trade flows through means of attracting more pro-trade oriented FDI. Even the developmental impact of FDI depends on the country's characteristics such as institutions, education, absorptive capacity and productive structures, which is enhanced with greater industrialization. Hence new and continuous investments are required to upgrade to higher value-added and sophisticated activities while at the same time building capabilities through learning. Policies which only target to attract foreign investment while, underinvesting in local capabilities such as in education, infrastructure and R&D, will not be successful (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). What these recommendations hope to provide is to set up and initiate conditions that are primed for growth of these higher value-added sectors in Sri Lanka. It is important to concede that these recommendations are not fail proof. Some or all of them could have unintended consequences or be difficult to implement.

6.2 Limitations & Reflections

One major limitation of the thesis is the non-availability regarding data in several parameters which would have reinforced several conclusions that have been made before. The foremost data that could have helped was the availability of time series data of sectoral investment and FDI for Sri Lanka, which would have given us a good overview of where investments and FDI was trending. The only glimpse we had was an early Board of Investment Report for 2013. We had no indication of whether there had been significant changes to the investment and FDI pattern prior to this time period or the 5 years after this period as well. This availability of data would have enhanced the conclusions we have made so far. Another drawback was the non-availability of data for the analysis carried out in chapter 4. The sample size was restricted for many of the industry categories due to missing data for longer periods as well as missing data in between the time periods which could have introduced bias and hurt the accuracy of the estimations. Some data points were estimated by the WTO for certain time points which would have been based on previous year's results which could have introduced autocorrelation as well.

Due to time constraints it is impossible to know whether the recommendations mentioned above have already been implemented, and if they have, to what extent they have been implemented. This is especially true when considering the recommendations of the import tariffs. While the recommendation says to enforce tariffs to protect firms in strategic industries, it is a contentious issue, since there many products within an industry, and at the same time one particular good can be imported from many countries and have different tariff rates depending on world free trade

agreements and foreign relationships. It is not possible to study what products have to be protected in the time frame available and what the blowback for such protection measures will be. Putting tariffs can cause other countries to retaliate with their own tariffs as well, as we can see from the trade war that is taking place between the US, Europe & China right now. Developing countries are said to have less policy space to pursue aggressive industrial policies than those that were enjoyed by the first-tier East Asian countries during their industrialization period. Policy space refers to the space for maneuver that policy makers have to pursue industrial policy. This space is restricted in today's climate of globalization, where decades of economic liberalization have led to range of multilateral, regional and bilateral agreements among nations. These agreements restrict the possibilities that developing countries have, to support their domestic industries. For example, some multilateral agreements state that there should be equal treatment for foreign and domestic goods, making it harder to protect domestic markets (UNCTAD, 2016).

Another key point to consider is the fact that, is it wise to consider industrial policy recommendations for structural transformation given the rise of China's industrialization. It is interesting to note what Chinese economic growth and industrialization does to other developing nations' industries. Chinese growth has increased exports from Latin America and Africa but the vast majority of these exports were primary products such as soybean, iron ore, copper etc. while the majority of imports from China into these regions were manufactured medium- and high-tech products (UNCTAD, 2016). Hence Chinese growth has been beneficial to resource rich nations, since imports by China of these primary products also led to commodity price increases. Sri Lanka is not a resource rich nation; therefore, Sri Lanka must compete with China in the industrialization front and that too at a disadvantage given China's large reserves of cheap labor (which is likely to keep wages low) and human & technological capabilities which does not offer much opportunity for industrialization in developing countries (UNCTAD, 2016). Adding to this fact is that China has also been accused of devaluing its currency, which increases the renminbi/USD exchange rate thereby increasing the real exchange rate aiding its export industry (Rajan, 2010). Even Chinese FDI (which we showed had the highest contribution in Sri Lanka) was directed towards sectors such as mining, infrastructure and energy rather than manufacturing which offers more learning (UNCTAD, 2016). Hence even though we have seen a slight decrease in the RCA index for machinery in China, it doesn't mean it has started to lose its edge in this sector. Hence, Chinese economic policies could influence the outcome of Sri Lankan industrial policy.

While the BOP constrained model gave us high coefficients for the machinery and the chemical sectors, the potential of these sectors to increase the MTSL growth rate in Sri Lanka is questionable. This is because even though the coefficients were high, in absolute terms, machinery exports composed only a small percentage of the total exports. Increasing the export share from these sectors is easier said than done, as some of the limitations mentioned above have highlighted. There are other barriers of entry into these sectors as well, such as the need for a highly skilled labor pool and other socioeconomic factors. Similarly, the usefulness of the Flying goose model for Sri Lanka can also be questioned. The countries which undertook this process of development had certain factors such social, political and institutional factors in their favor. We look at these factors in detail next.

6.2.1 State Capacity (Political & Institutional Factors)

A country's demographics, politics and social cohesion also plays a crucial role in implementation of selective industrial policy. While East Asian countries are made up of homogenous populations, Sri Lanka is a multi-ethnic country with different religions which was one of the reasons for the ethnic conflict. Hence structural transformation is difficult to accomplish, and it requires a modicum of social consensus (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014). One of the key insights and takeaways from the literature (Amsden, 2001) (Singh, 1997) (Storm & Naastepad, 2005) that talk about the rise of the east Asian nations, was the presence of a cohesive society with a stable government, the existence of which is questionable Sri Lanka, due to ethnic tensions. Political instability can be a great hindrance to economic development especially affecting investments. This is because new governments that come to power can do away with old policies, making potential investors hesitant to undertake capital intensive projects, especially before a new election cycle. This is because the outcome/payback of an investment might lie in a period where a new government takes over.

The main argument against industrial policy, supported by neoclassical economics and the Washington consensus, revolves around "government failure" (Salazar-Xirinachs, Nübler, & Kozul-Wright, 2014)**.** According to UNCTAD (2016) government failure can occur in both functional and selective industrial policies, but the chances of failure is higher with selective policies, since governments interfere more with market functioning. Government failures are also considered larger and more frequent due to the lower capacity of the governments to design and implement policies (UNCTAD, 2016). There are three factors that lead to government failure: information, corruption, and a lack of financial resources (UNCTAD, 2016). Information relates to information on market and exports trends, technologies and other macro and microeconomic parameters, which are required for industrial policy making. For Sri Lanka the factors of corruption and a lack of financial resources are the major impediments. The latter is currently predominant due to the current debt crisis, but the recommendations provided above takes this constraint into consideration. Corruption is rampant in Sri Lanka as well at all levels. Recently there was a scam at the treasury bond auction, where several people ended up getting indicted including the former Minister of Finance and the former governor of the Central Bank, and which cost the exchequer almost 70 million dollars (Srinivasan, 2018). The factor of overcoming corruption falls in the political spectrum and hence will not be discussed here.

The above-mentioned factors form the foundation of the concept of what is called state capacity. UNCTAD (2016) mentions that literature on this subject point towards governments in developing economics not able to effectively implement industrial policy, especially selective industrial policy, given their limited state capacity. Salazar-Xirinachs, Nübler, & Kozul-Wright (2014) also mention that governments with basic capabilities should limit themselves only to horizontal policies, and that they should go into selective policies only when they build up capabilities. There are several indicators of state capacity such as the ease of doing business index (Sri Lanka #111) and the Bertelsmann Transformation Index (Sri Lanka #33) which ranks transitioning countries according to the quality of governance and a government's capability to define goals and implement them (UNCTAD, 2016). These indicators have been criticized though for their methodology. Even though Sri Lanka ranks low in these indicators, one counterargument against the point of weak capacity is that it can be overcome as industrialization progresses and

governments learn by doing. We draw once again upon the example set by South Korea, which built up state capacity through a process of reform and experimentation through its industrialization period, and at one point even sent its bureaucrats to Pakistan to be trained in economic policy making (UNCTAD, 2016).

Enabling institutions are key as well for the growth of industrialization. As mentioned in the recommendations above, development banks played a key role in this growth trajectory in east Asian countries. Examples include the BNDS (Brazilian Development Bank) and the KDB (Korea Development Bank) which were instrumental in contributing to industrialization in their respective countries (Amsden, 2001). While Sri Lanka has state owned banks as mentioned above, these are not exclusively development banks, whose sole purpose is to lend capital to industrial sectors. These state-owned banks undertake other commercial activities similar to private banks. Hence steering state-owned banks to invest in industries will not reap the same output as having a development bank lending exclusively to industrial sectors. Therefore, the creation of a development bank is essential to funnel capital towards more industrial sectors, but his brings about new challenges such as the need for more capital in setting up a new development bank to undertake risky, never before done industrial projects in the country.

But irrespective of these limitations mentioned above, the policy recommendations derived from the two models, the BOP & the FGM, are the best way to go about achieving industrialization in a country like Sri Lanka, without falling into future debt crises. Even though the country might lack state capacity to execute the relevant policies, the experience that comes from trying will be extremely valuable and is an example of learning by doing. It is also better to execute these polices, which might fail, rather than continue in the current path and definitely fall into another debt crisis which will further stunt growth and put a burden on the government.

6.3 Conclusion

We finally now answer the objective and the research questions. The objective of the thesis along with the primary research question was to prevent future debt crises through the implementation of macroeconomic policy recommendations, taking into consideration the current economic constraints as well as showing how greater technology/manufacturing capabilities can contribute to sustainable GDP growth and how to transition into such an environment. While we have observed that the Sri Lankan economy has grown rapidly, we have shown that this was through means of accumulating debt. Hence through the theory of the Balance-of-payments constrained growth model we found out that Sri Lanka has been growing faster than what it is capable of, with its current export and import composition, and this was only possible by means of accumulating more debt. Hence Sri Lanka faces two paths. To grow at a slower rate which reduces the rate of the growth of imports, or to grow faster by increasing the share of exports from *high income elasticity of demand for export goods*, which will raise the MTSL growth rate as we elaborated in Chapter 4. If Sri Lanka was to choose the latter, structural transformation through means of the Flying goose model was recommended and in line with this, Sri Lanka's economy was diagnosed in this context. Following this the policy recommendations provided above target expansion of Sri Lanka's economy into these high elasticity sectors by accelerating the FGM of development. Hence the objective and the primary research question was answered by means of the BOP constrained growth model and the FGM, along with the relevant recommendations.

The first secondary question, questions what the impact on GDP growth will be due to a transition into a high technology economy and how this transition can occur. This was answered as well with the Balance of payments model and the flying goose model. The extension of the BoP model, The Multisectoral Thirlwall's law, showed that a countries growth was dependent on its *weighted income elasticity of demand for exports*. Hence a higher weighted income elasticity of demand along with a higher share of exports from this high elasticity sectors contributes to a higher MTSL growth rate. The results of the data analysis showed that Sri Lanka has a high elasticity for the industrial sectors of machinery and chemicals, but had a lower share of exports from these sectors contributing to a low weighted elasticity and lower MTSL growth rate. Hence this showed that there was a positive impact on GDP per capita growth by technology-oriented industries. The transition on to a high technology industry can occur through the FGM process and the relevant recommendations provide the conditions to accelerate this process.

The second secondary research question, deals with what kind of monetary policy showed be followed by the Central Bank. While in the introduction I have mentioned that the IMF recommended a monetary policy that will enable curbing inflation and reducing credit growth, there was a risk of reduction in private investment. Evidence from Chapter 4 & 5 pointed towards a greater need of investments in strategic sectors in order for income growth to increase rapidly, while ensuring balance of payments, which would be difficult to carry out in a period of high inflation and tightened monetary policy. But more literature on this subject formed the foundation of the recommendations which concentrated on what is called concessionary loans, where loans are offered below market rate for strategic industries, while loans for all other purposes are kept at the market rate. Hence this ensures that inflation and credit growth in non-strategic industries are kept in check with high interest rates, while ensuring that credit growth is continued in strategic sectors. The dilemma of what monetary policy to be followed is resolved here.

The last secondary question which deals with what the risks of carrying out fiscal consolidation are was dealt with in the 2nd chapter, where I talked about the impacts of fiscal consolidation under IMF conditions. While fiscal consolidation is supported as the appropriate measure during debt crises, some literature pointed towards how fiscal consolidation can also worsen the GDP thereby increasing the debt-to-GDP ratio and how there are inherent risks to fiscal consolidation such as how tightened monetary policy during fiscal consolidation can depress private investments severely and that fiscal consolidation can be self-defeating when it is carried out by other countries at the same time. Hence taking the impacts and risks of fiscal consolidation into consideration, the recommendations formulated above, haven't tried to increase the overall investment rate, rather create conditions and try to create an environment where the current level of investment is shunted towards more strategic industries promoting growth of these sectors, while limiting investment in other sectors. Hence through these recommendations, the risks of fiscal consolidation can be circumvented.

Hence Sri Lankan policymakers must wisely follow industrial policy if it is to avoid continuously propping the economy with bailouts. Increasing reliance in tourism does bring in foreign exchange, but the growth in tourism that has been observed in the past decade has been due to the suppressed potential during the prewar era, which may start to flatten out in the decade to come. Tourism also doesn't contribute to any real learning capabilities and doesn't advance the economic

competitiveness of Sri Lanka. Hence rapid industrialization along with diversification is required if the country is to be competitive in today's dynamic economic environment. Case in point is the example of Argentina. Argentina is classified as a high-income country, but its dependence on natural resources and agriculture shows that its production structure has changed very little (Agriculture exports composed 64% of total exports in 2016). Argentina failed to invest in mid and high-technology sectors during the period (1970-1995) which saw high investments in these sectors in east Asian countries. During this period Argentina's manufacturing exports rose from 13.9% to 33.9%, but countries like Thailand, Turkey and Indonesia showed much higher increases (Amsden, 2001). This weakness in the production structure reflected in the two debt crises it has faced in 1991 and 2001, and has now recently borrowed $50 billion from the IMF to help with its currency volatility in exchange for cutting its fiscal expenditure (Gillespie & Millan, 2018). During its debt crises, Argentina even carried out IMF recommended reforms, but no structural transformation took place. The situation is analogous to a building with a nice façade, but with weak foundations. The structure can still stand, but given time and exposed to the elements of shock and pressure, it can come crumbling down.

Amsden (2001) refers to many moments' in history following which countries underwent rapid industrialization such as China's Great Leap Forward and other events that took place in Korea, Taiwan, India, Malaysia and Turkey. For Sri Lanka the end of the three-decade civil war heralds a second coming. The post-civil war era has seen rapid growth in the country, but this was through means of mounting debts, without any change to its production structure from the prewar era. Sri Lankan policy makers have to assess their goals so as not to squander their chance at reorienting themselves and preventing from further locking themselves into their current production structure. During the prewar period, change was hard to implement in the face of an ongoing war, but the end of this war has given policy makers an opportunity to reinvent Sri Lanka in a new light.

6.3.1 Further Research

The first area of further research is empirically estimating the MTSL growth rate with migrant remittances and foreign capital inflow and the interest payment outflow since this can affect the balance of payments as shown by equations 14 & 15 in Chapter 3. This would give a more accurate estimate of the MTSL growth rate for Sri Lanka's unique case. Filho, Jr., & Libânio (2011) provide extensions of this model which incorporates foreign capital inflow and interest payments outflow. They develop a differential equation for the evolution of foreign debt over time, which is a function of interest paid and speculative investment. Filho, Jr., & Libânio (2011) then present three cases regarding the behavior of capital flows and interest payments which affect the evolution of debt growth. In the first case, there is previously accumulated debt stock, with no capital inflows and no interest payments. In the second case, there is previously accumulated debt stock as well, but there is a flow of speculative investment inflow and interests are paid out entirely. In the third and final case, there is previously accumulated debt stock, in addition to inflows of direct and speculative investment and interests are paid out completely. In each of these cases, equations are derived which give the trajectory of the debt growth, taking in to consideration various factors such as the world income growth, the market interest rate and the various elasticities. Accordingly, various debt growth projections can be made according to these factors. Hence further research can be done to carry out these tests empirically for Sri Lanka's case to understand the trajectory that the debt profile of the country can take by varying the different economic factors.

The recommendations given above are very broad in nature, especially when it comes to advocating import tariffs to protect the domestic market. The second area of further research involves examining Sri Lanka's import tariffs and looking through extensive literature, WTO regulations and free trade agreements. This is done to identify exact products within the targeted industries which can be protected from foreign competition by protecting the domestic market, without running afoul of these WTO & free trade agreements. This can lead to more specific recommendations which can be more relevant from a policy recommendation point of view as well as provide an overview of which industries to target for expansion without running into problems such as trade wars. Depending on data availability in the future, analysis on FDI and investment in manufacturing, can be done to further strengthen the arguments for industrial policy as well.

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Appendix A- Partial Autocorrelation Function

The Partial Autocorrelation Function (ACF) graphs for all the export & import sectors are as given below.

Exports
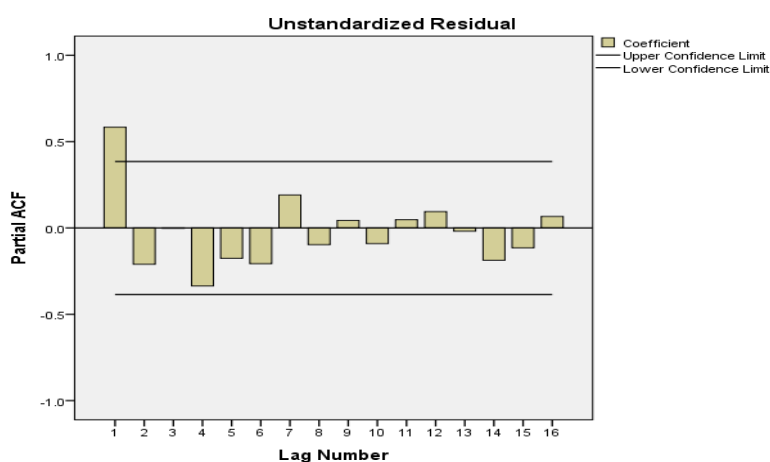
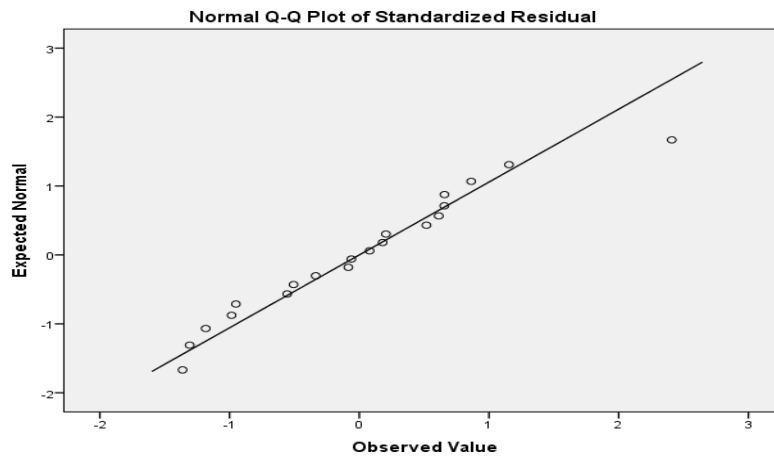**Figure A 1: Agriculture**
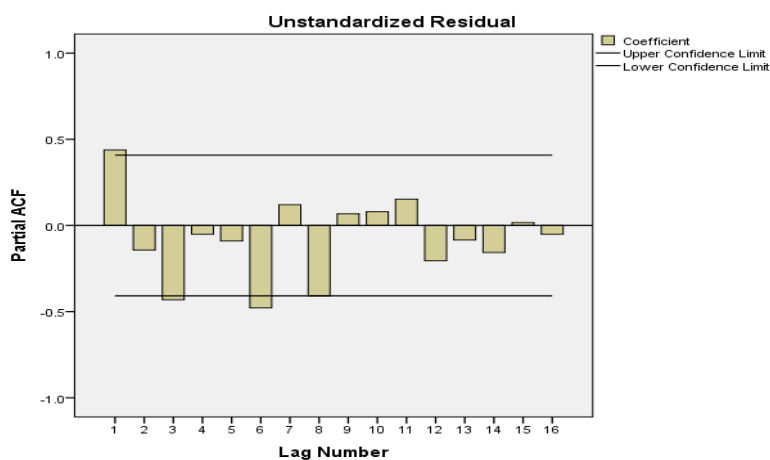
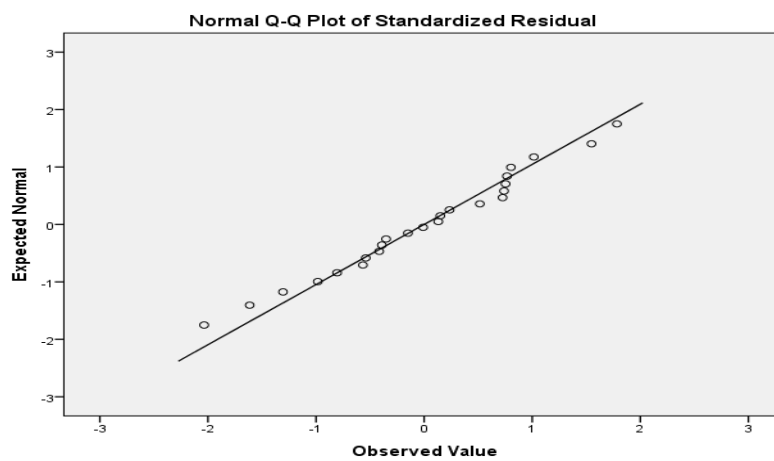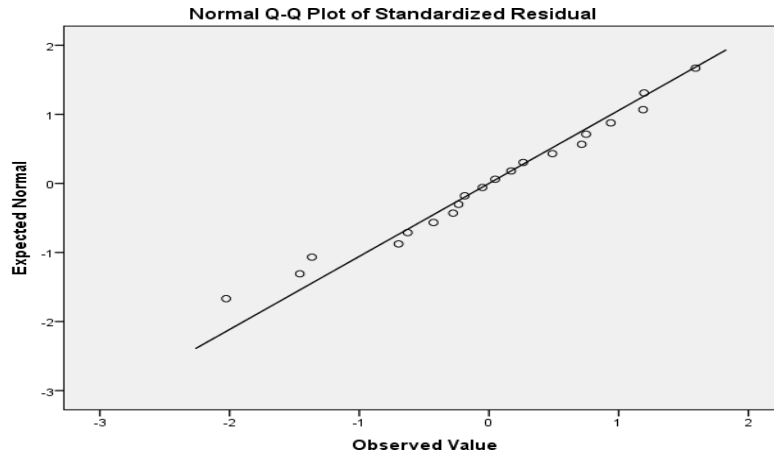**Figure A 2: Chemicals**
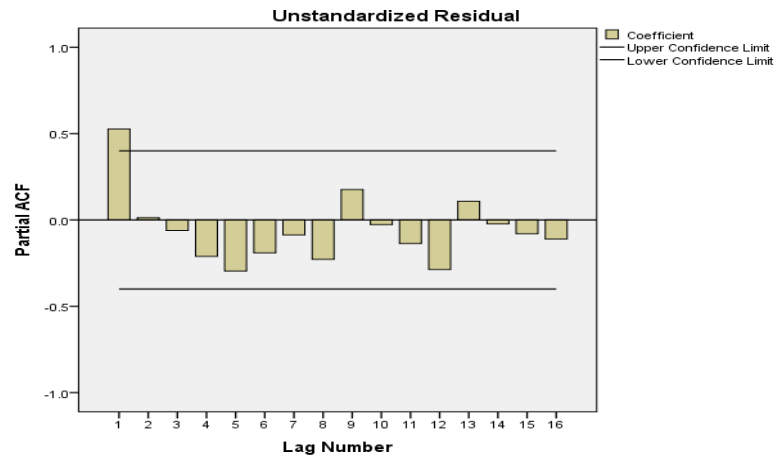
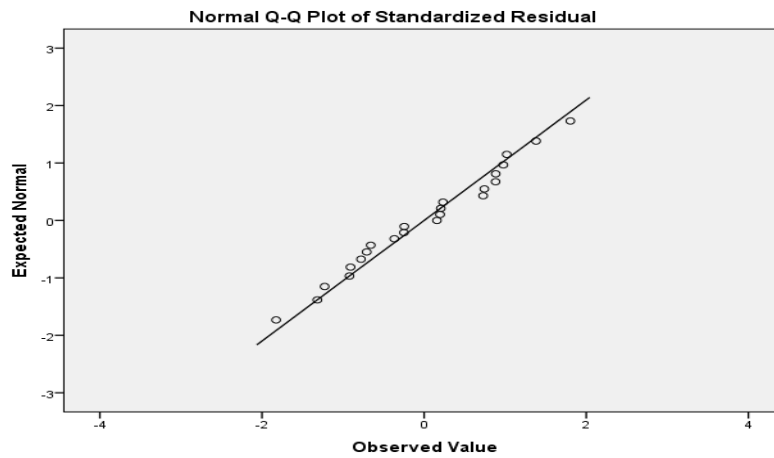**Figure A 3: Clothing**
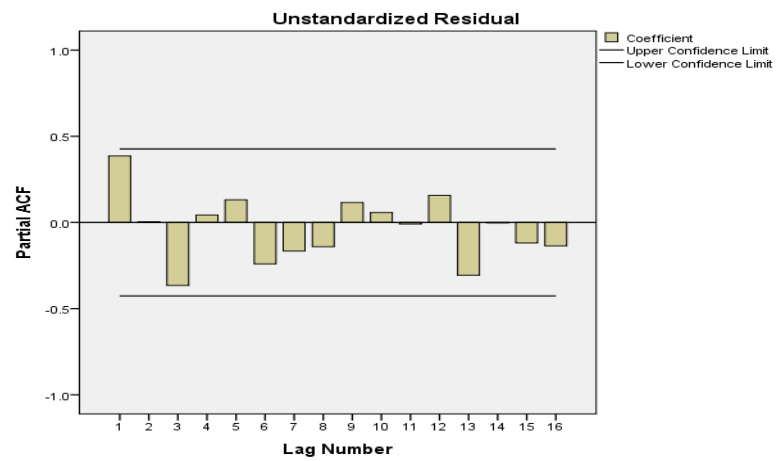
Figure A 4: Fuels & Mining
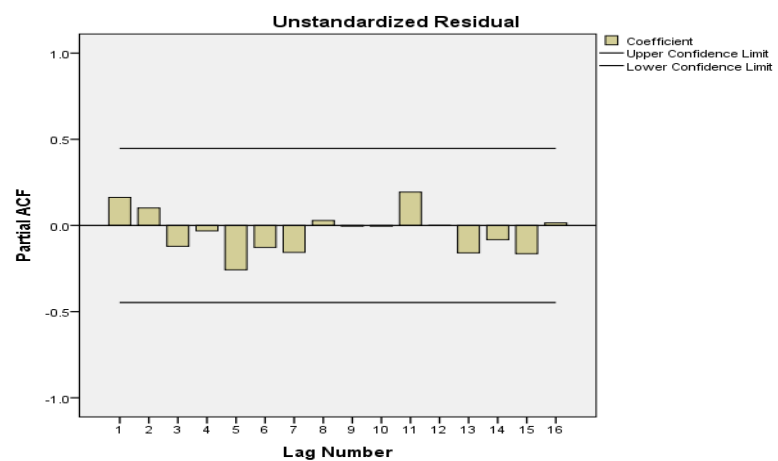
Figure A 5: Iron & Steel
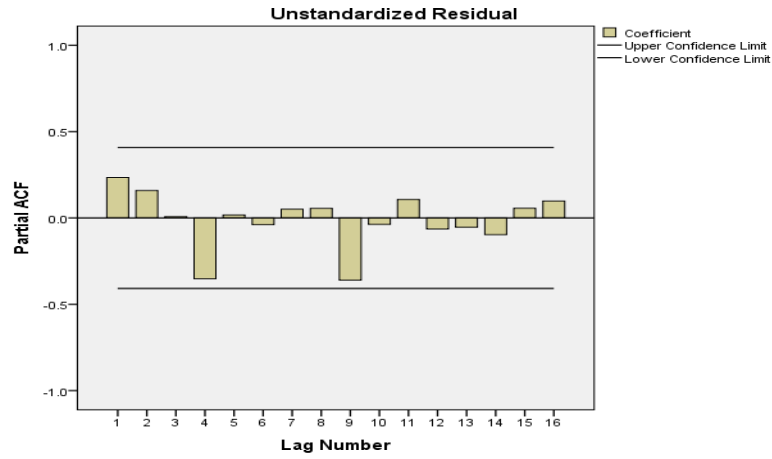
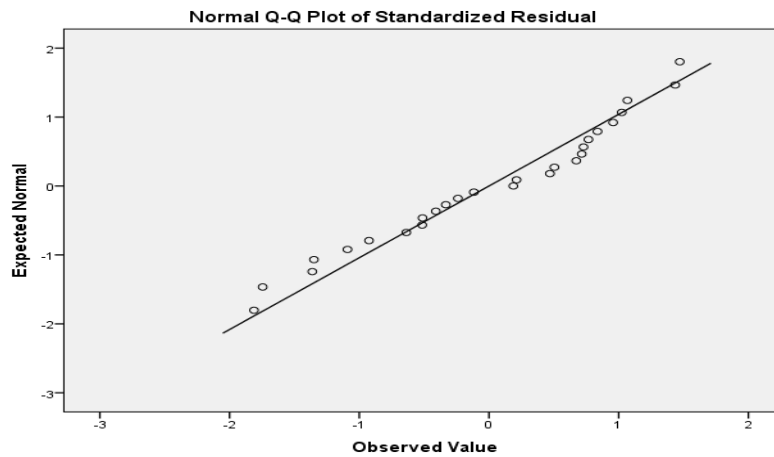**Figure A 6: Machinery**
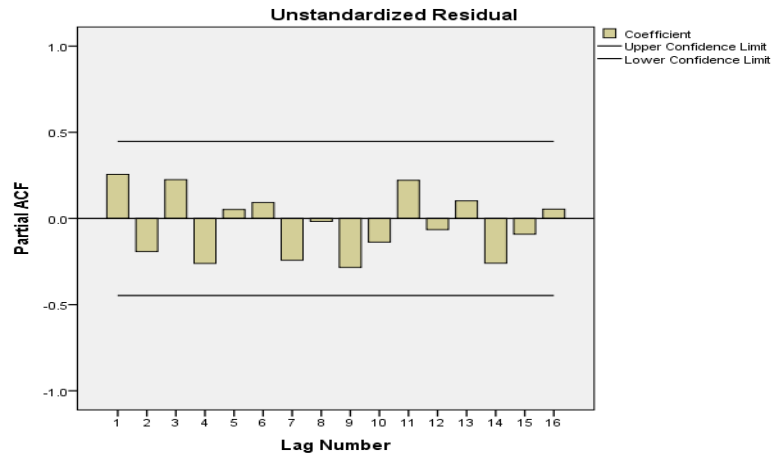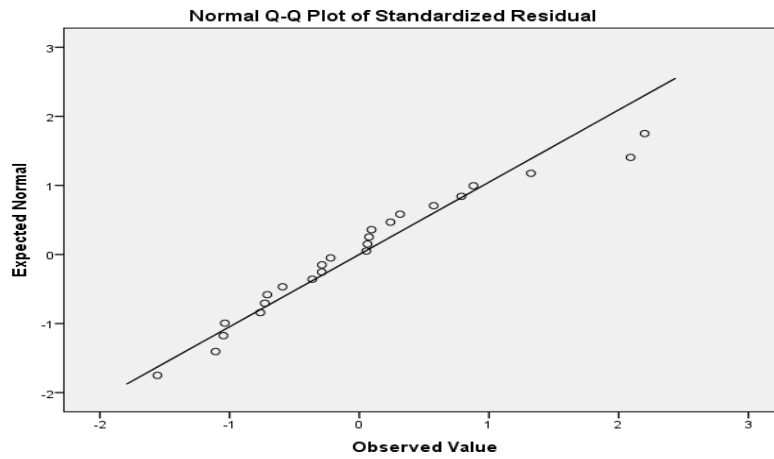

Figure A 7: Other Manufacturing
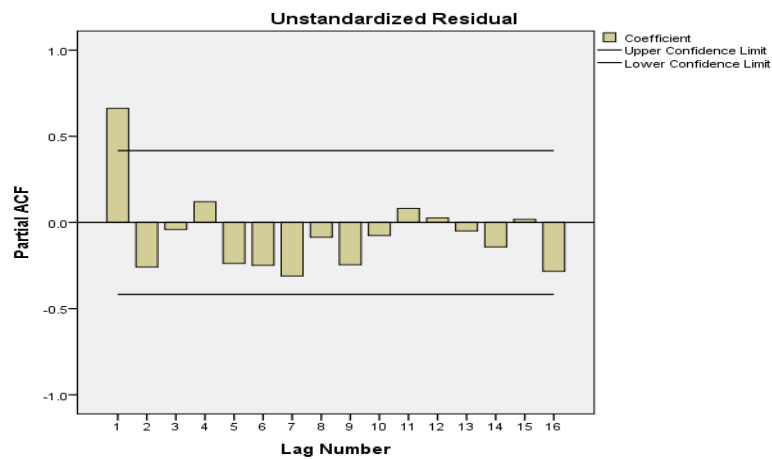
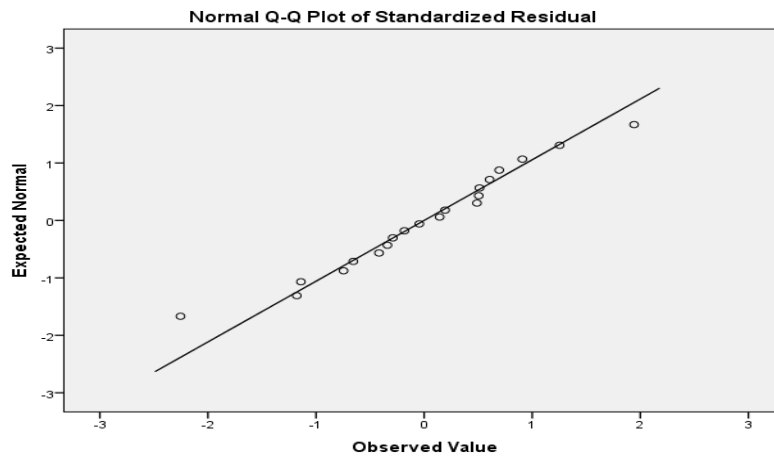
Figure A 8: Textiles

Imports
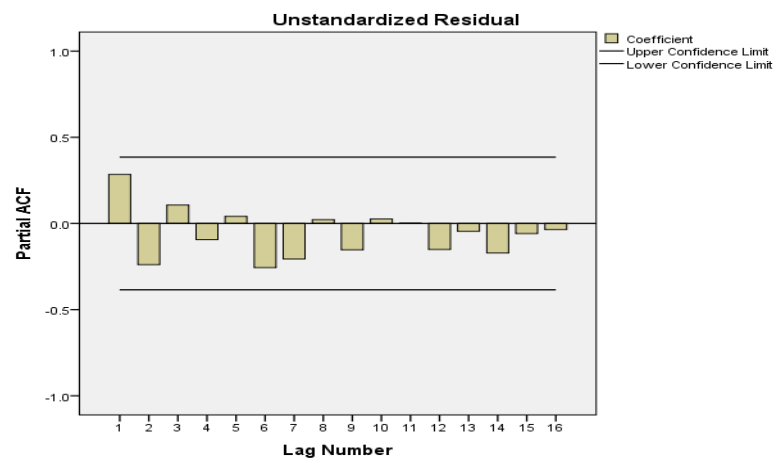
Figure A 9: Agriculture
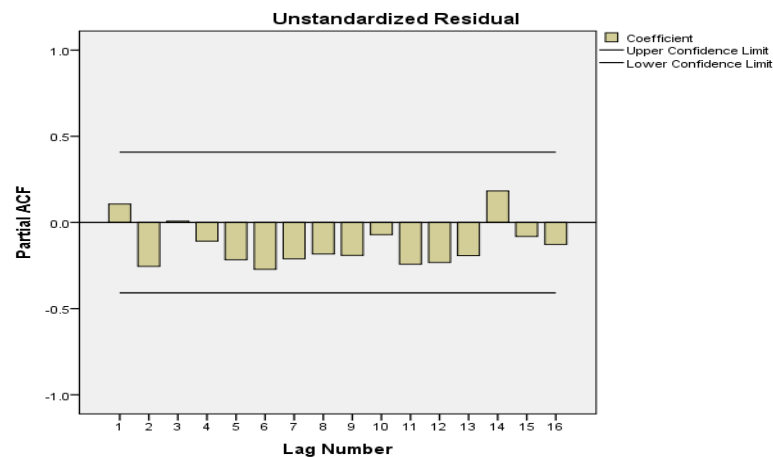
Figure A 10: Chemicals
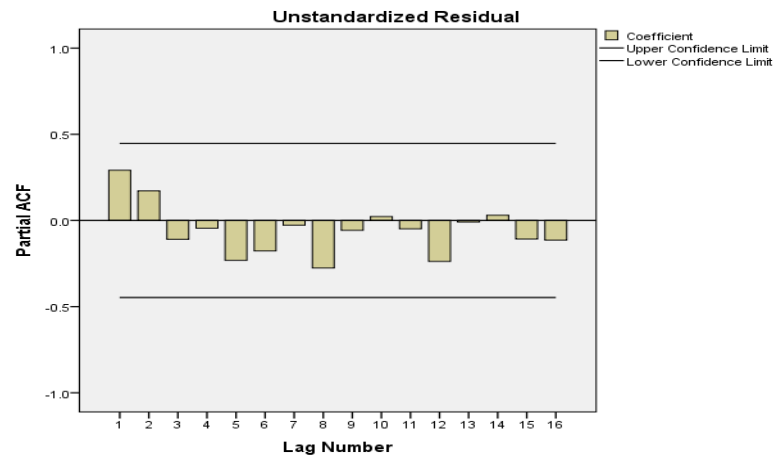
Figure A 11: Clothing
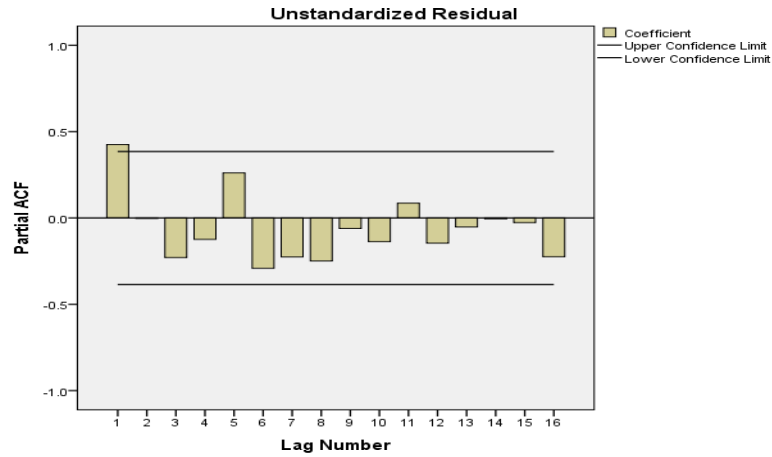
Figure A 12: Fuels & Mining
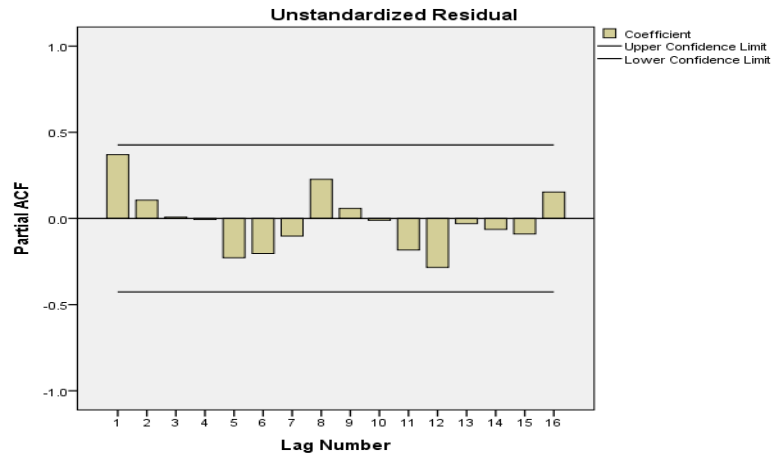
Figure A 13: Iron & Steel
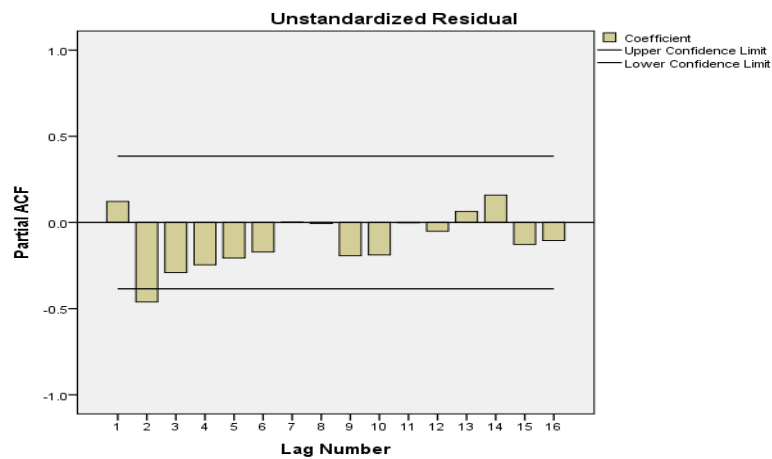
Figure A 14: Machinery
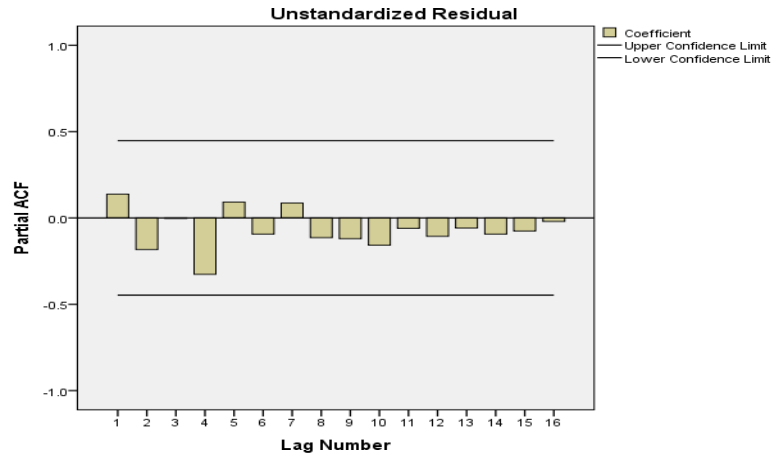
Figure A 15: Other Manufacturing
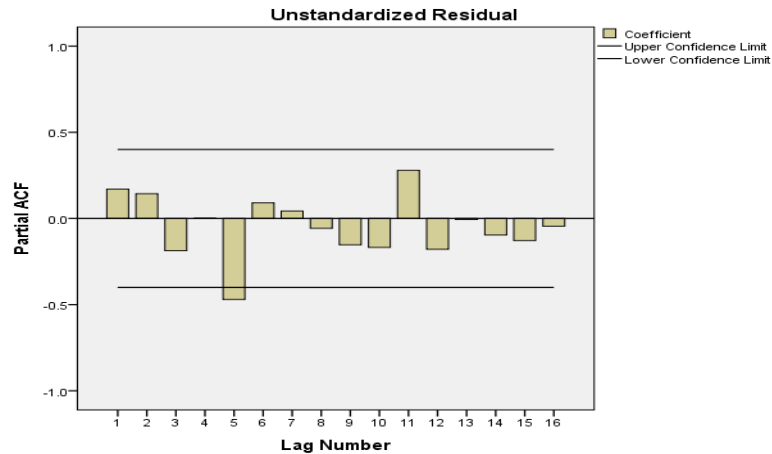
Figure A 16: Textiles

Appendix B- Normality of Residuals

In linear regression it is important that the residuals have to be normally distributed. The normality of the residuals is also model dependent i.e. this can change with more predictor variables. To check for normality, we use the Q-Q plot, which compares the observed quantile with the theoretical quantile of a normal distribution. If the distribution is normal, then we should expect the points to lie around the y=x line (Introduction to regression with spss, n.d.). The Q-Q plots for the various export and import sectors are as shown below.

Exports
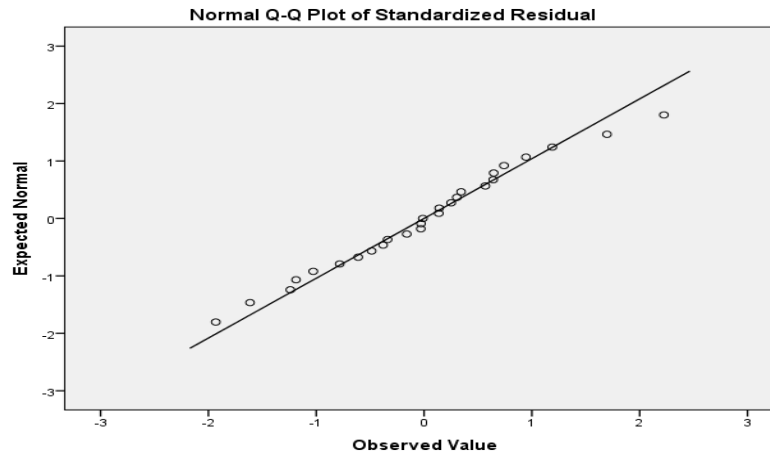
Figure B 1: Agriculture
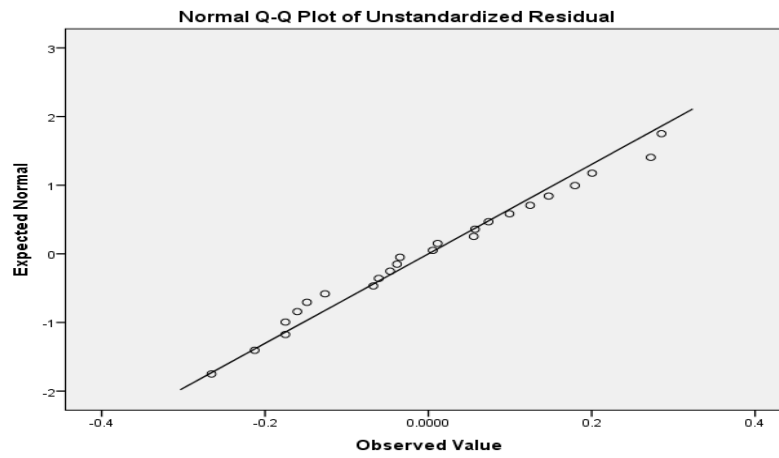
Figure B 2: Chemicals
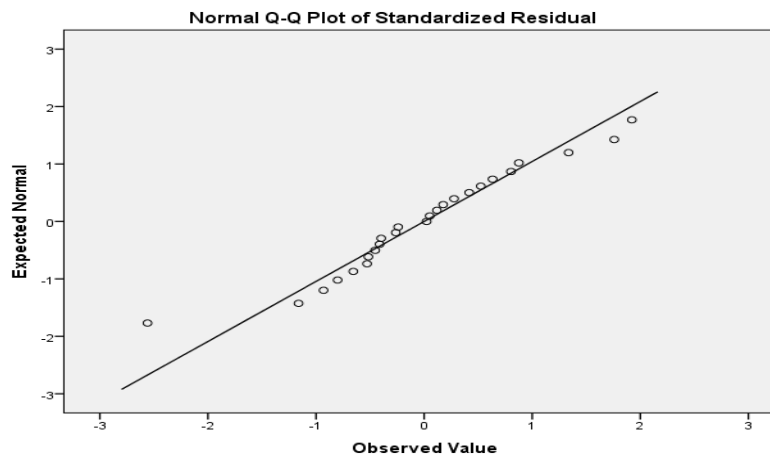
Figure B 3: Clothing
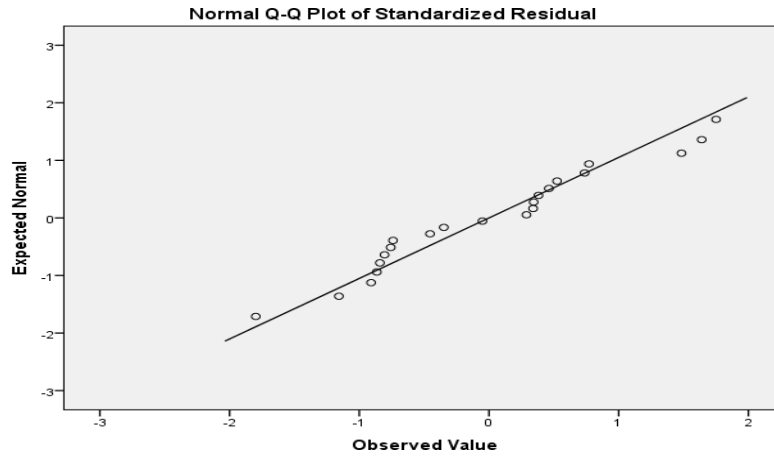
Figure B 4: Fuels & Mining

Figure B 5: Iron & Steel

Figure B 6: Machinery

Figure B 7: Other Manufacturing

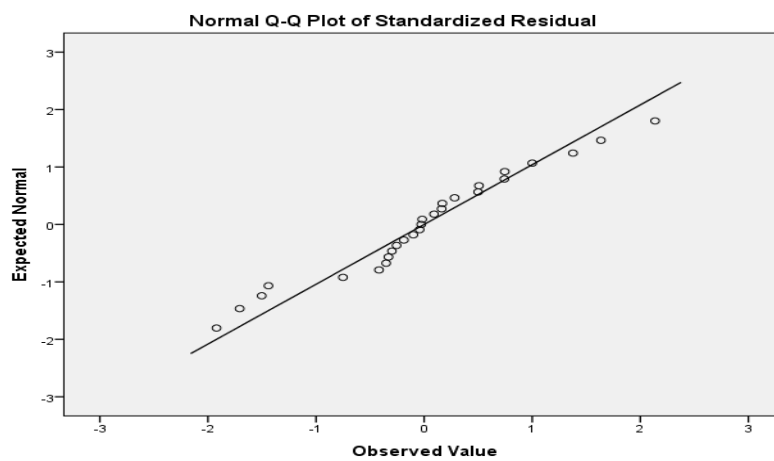**Figure B 8: Textiles**

Imports
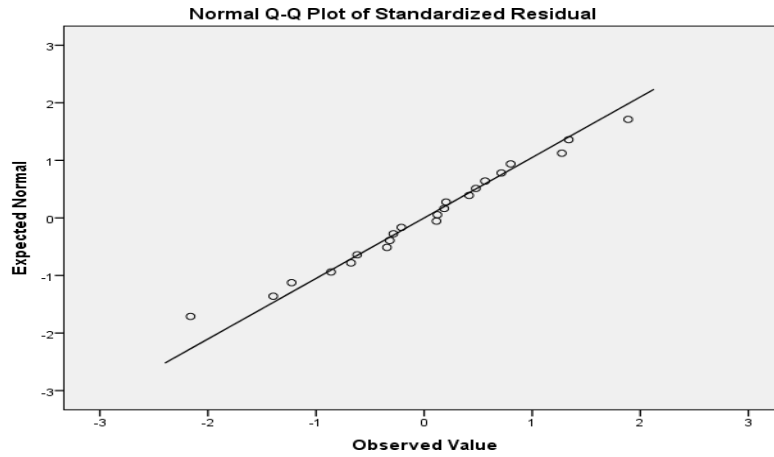

Figure B 9: Agriculture
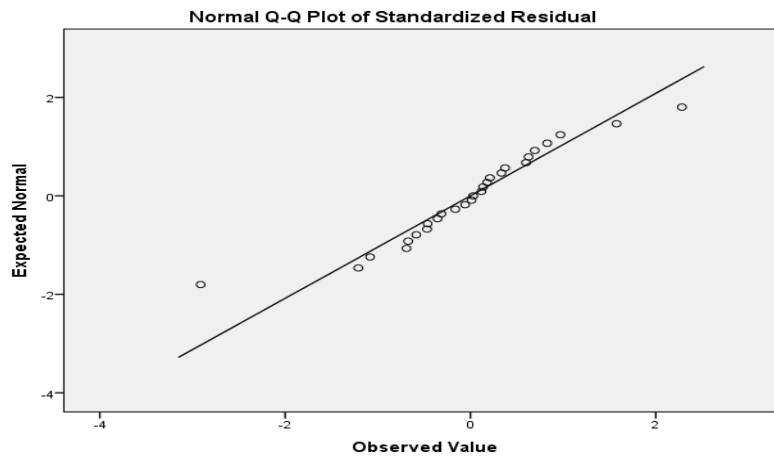
Figure B 10: Chemicals
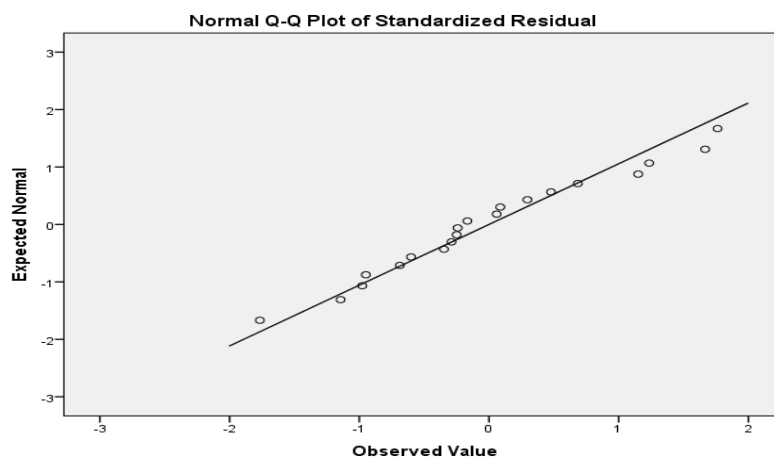

Figure B 11: Clothing

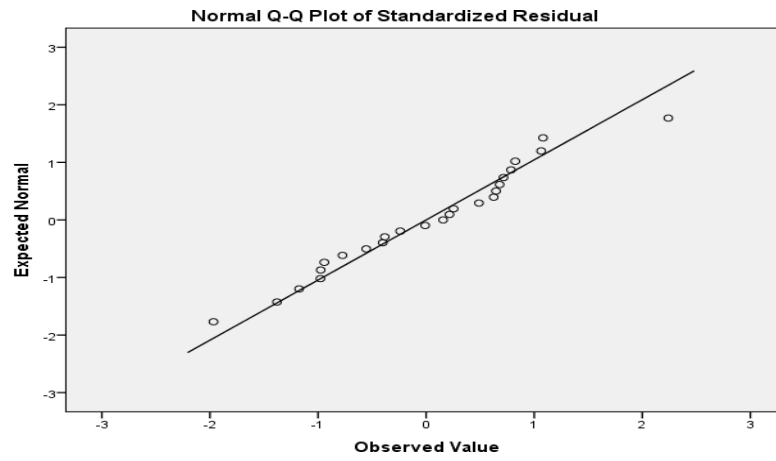**Figure B 12: Fuels & Mining**

Figure B 13: Iron & Steel

Figure B 14: Machinery

Figure B 15: Other Manufacturing

Figure B 16: Textiles