

# Myanmar's Economic policy in Transition: Comparative Assessment & Empirical Analysis



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# Declaration

I, hereby, declare that this thesis contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution and to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except where due references is made in the text of the thesis.

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# Abstract

This paper comparatively examines the economic policies of Myanmar in transition with other Asian countries' experiences and test the credibility of the policies with econometric methodology. Comparative studies with other emerging economies and transitional stages offer the opportunity to examine Myanmar's transitional policies clearly and found out that Myanmar is at the cross road and not focusing on the old pattern of developments of other's success stories. Myanmar is definitely not focusing on the productivity of agriculture for the surplus transfer to industrialization.

It assesses the development pattern of Myanmar from the theoretical perspective. Growth models mainly address the importance of saving and capitals, human capital, openness to the trade, macroeconomic stability, political stability, technological change and most importantly the surpluses transfer from agriculture to industrialization as key drivers to economic growth.

Based on the Cobb-Douglas production function, this paper tests the credibility whether the economic policy reform of Myanmar is contributing much to the growth and development. It employs the time series data set from IMF staff estimates, World Bank, ADB, MOFA, and the technique of cointegration test within an Autoregressive Distributed Lag Framework (ARDL ) proposed by Pesaran (1997) . The empirical results show that the economic policies of new Myanmar government are not focusing on the right direction to realize the potential gains and last but not least, the paper shades lights on the policy recommendations.

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# Chapter 1: Introduction

## 1.1 Overview of Current Myanmar's Economic Transition

For many decades, Myanmar/Burma's economy has been crippled by its institutional failures and mismanagements. However, after the election of 2011, the sudden change of the political outlook in Myanmar invites, if not confusion, more critics than advocates. While there are voices of disbeliefs if it were a genuine change and fears for the havoc caused in the name of progress (Turnell 2011, 88), there are also researchers who bestow faith in the quasi-democratic government which is vigorously casting off the military personality restraints (Stiglitz 2012). However, Myanmar's recent economic reform is not new to Asia as China started its process of transformation of economy in 1978 as well as Vietnam in 1986, India in 1992, Cambodia in 1999 and Timor-Leste in 2002. Other examples outside Asia might be of Eastern Europe in 1989 and Mauritius in 2005. From the economic stand point, institutions like Asian Development Bank (ADB) (2012) and World Bank (2012) have acknowledged that Myanmar has already made a giant step towards economic reform and re-engagement. Within 18 months, Myanmar's new government has endeavoured to, float the currency for the first time in the economic history of Myanmar, and make initial steps towards banking reform, legislating foreign investment laws and form trade unions as well as to reform taxation system.

However, legacy of six decades, if not a century, of poor governance, stagnation, economic repression and negligence in Myanmar has deeply wounded the economy which cannot easily be healed by 'elusive freedom' (Taylor 2011, 119). Chronic disease of monopolistic economy ruled by cronies, deeply rooted corruption, poverty stricken rural areas and ethnic minorities, crumbling infrastructures, electricity and water shortage, suffering agricultural sector and failure of banking system are just few obvious problems of the economy that make Myanmar fallen behind its counterparts and neighbouring economies by any measure of economic instruments. One implicit reason of Myanmar's overdue closed-door economy was that of 'resource curse' factor as it provided the financial backup to the inefficient ruling bodies (Pick and Thein 2010, 271).

Yet, notwithstanding the precarious state of Myanmar's political change that is controversial, any economist would instantly agree upon the needs in Myanmar (Fukuyama 2012) to

revitalize, the weak economic efficiency and macroeconomic framework devoid of market mechanisms, the shortage of human capital, the deficiency in mobilizing domestic funds and the infrastructure problems. Since, how is the economic policy composed today would determine the future of Myanmar, it is very important that the economic policies adopted are the most suitable for Myanmar (Takhun 2012).

## **1.2 Objective of the Study**

The main purpose of this study is to comparatively assess the detail relationship of economic policies and economic performance in Myanmar and other Asian countries. It analyses the impact of economic policies, its variables on the overall economic performance in Myanmar. It focuses on the long term trend and comparatively examines with the experiences of other Asian developing and developed countries. It aims to answer the questions of whether Myanmar's new transition economic policy is contributing to sustainable development and if not, how should Myanmar approach economic policies.

Its aims are also to underline the perennial problems of Myanmar economy relating to the economic policy and to recommend possible sustainable economic development policies. First, this paper reviews and discusses the Myanmar's recent economic development experiences. Second, it delves into the implicit and explicit factors that drive and shape the economy of Myanmar with the perspective of comparative analysis; third, it recites the empirical studies and sheds light on the details of the actual and potential challenges as well as opportunities that lies ahead by readjusting with economic growth models. Fourth, it evaluates the possible policy options with the help of econometric analytical approaches and makes recommendations that Myanmar government could pursue in order to achieve sustainable economic growth.

The study is significant for Myanmar. First, it has time relevancy as Myanmar needs real good way of conducting economic policies now. Second, this study will provide further insights into the feasibility of economic policy with comparative evidences. Third, the result will hopefully contribute new perspectives in making economic policies.

## **1.3 The Structure**

The structure of this dissertation is as follows. Chapter two provides information of the economic policy and where it is leading in Myanmar. It includes cross country analysis of its

rationale, the implicit and explicit trends, and the current issues from the economic policy. Chapter three addresses the literature reviews of the empirical methodologies and reconciliation of different growth models. The research was concerned with exploring the policy process with data from the key players, or stakeholders, policy implemented before as well as comparisons with other countries involved in each of the three aspects of the policy process, to generate the meanings that will lead to better economic future. The data were then analysed to construct conceptualisations about the policy process, which in turn increased the knowledge of the process. In addition, in the meta-analysis, a critical perspective is brought to the meta-level themes that emerged from the research. Chapter four outlines the Data and Methodology employ in this study. Comments are made to the limits of the data available for empirical studies. For this reason, this dissertation will undertake a quantitative approach using data from the 1998 to 2017 UN (The United Nation), IMF, the World Bank, IMF (International monetary Fund) estimates , Asian Development Bank (ADB), The United Nation Educational Council, Central Intelligent Agency (CIA) , Myanmar statistical department and Census tailored to the Myanmar's economic trends. Chapter five addresses the empirical results found in this study. Economic development in terms of growth of GDP and other development indicators are considered in the analysis. By analysing the results of these estimates, the likely implications of economic policies on economic performance in Myanmar are then evaluated and made the recommendations. This includes a discussion on the limitations and the accuracy of the results.

## **Chapter 2: Economic Policy Issues in Myanmar and Comparative analysis**

### **2.1 Myanmar's Overcentralised Economic Reform**

Just as 'Burmese way to Socialism' has taken place for the reforms in Politics and Economy of Myanmar in 1962, a prominent gradual approach to 'Myanmar way to Democratization' was recently introduced in March, 2011 (Kundu 2012). The reform-minded President Thein Sein led the new quasi-democratic government and has started to eliminate the repressive economic policies that has crippled Myanmar's economy for many decades and brought out the policies of broad-based and sustainable economic growth. Firstly, Myanmar's new government started to adopt the floating exchange rate that helps the terms of trade improvement and helps also to eliminate the large informal sector which was operating in the black market exchange rate (Park et al. 2012, 6). In the beginning of the reform, researcher like Kubo (2011) worries that the distorted effect on the fiscal deficit might need the technical sterilization since it would increase the supply of money and lead to an unwanted inflationary pressure imposed on the market which is still not happening in 2013. There are also policy reforms on taxation systems, foreign investment laws and anti-corruption laws. The new foreign investment laws that favours more on the foreign investor were introduced in 2012 as well as new agricultural laws have also been passed (Government of the Republic of the Union of Myanmar 2013). A new banking reform with greater autonomy of central bank of Myanmar to execute monetary policy is being considered. For the first time in history of Myanmar, the budget distribution was discussed openly in the parliament and significantly increased the amount of Health and Education budgets which was the lowest in Asia before. For the aim of more industrialized nation, a new labour law has been passed.

In such an transition phase, building an international image for Foreign Direct Investment (FDI) as well as favourable social and economic conditions are necessary (Clark 2012, 178). Successful integration of market Mechanism from the centrally planned economy such as in Myanmar needs an active policy based on the feasibility and implementation. This facet would require the broad based program of legislations aimed at creating market mechanism and promote the growth of private enterprises. For such enterprises to emerge, access to the

medium amount of loans are necessary. However, access to the loans in Myanmar is still very difficult (Park et al. 2012, 6). On the other hand, in the absence of the targeted programs of activity aimed at the development of an informed market system, the result would be the decline in production and deterioration in living standards. According to neo classic theory, private property and competition is needed to provoke market economy and therefore private interest and private property are very important. Ronald Coase (1937, 395) has pointed out that market mechanism and creation are the purely the task of entrepreneurs. The market intermediaries are the one who provides financial support such as commercial banks, established links with industrial and agricultural producers and final consumers and thereby creating the network of market mechanism.

On the negative side, Myanmar's weakness in the economic policy reform process was of being negligent of measures in the agriculture sector to raise farmer incomes, an essential step largely forgotten in a country which has 70 percent of the population in the rural area. On the other hand, Myanmar's GDP is still relying on the natural resource extraction and it continues at an unsustainable and even counterproductive rate (Rieffel 2013).

From the political stand point, IBAHRI (The International Bar Association's Human Rights Institute) (2012) has criticised that policy decisions in Myanmar are being made largely in a non-transparent, top-down, discretionary manner as was the practice in previous governments. Most of the comments made by Myanmar people and researchers are that Myanmar is now stuck in the step of implementation. In fact, restructuring of the industrial enterprises and start a new phase of economy in order to improve efficiency and competitiveness turned out to be the most difficult aspect in any transition (Stiglitz 1996, 160). According to CGA's (Crisis Group Asia 2012) report, in the case of Myanmar, although the handful amount of policy makers at the top may initiate the changes, forms of restructuring at the basic level has not taken place yet. Therefore, those who are vested with the authority at the government and enterprises, the dictator's norm are still prevalent and they are still making every effort to preserve their authority and privileges as was with former military government (Jagan 2013). So the business regulations are still kept with red tapes and different forms of corruptions. The serious setback in Myanmar is that of the delegation of rights and responsibilities, probably hardest part of the whole transformation, are not properly regulated. The new inexperienced government of Myanmar could easily derail the economy by the wrong approaches of implementation of new economic policies.

## 2.2 Macroeconomic Framework in Myanmar

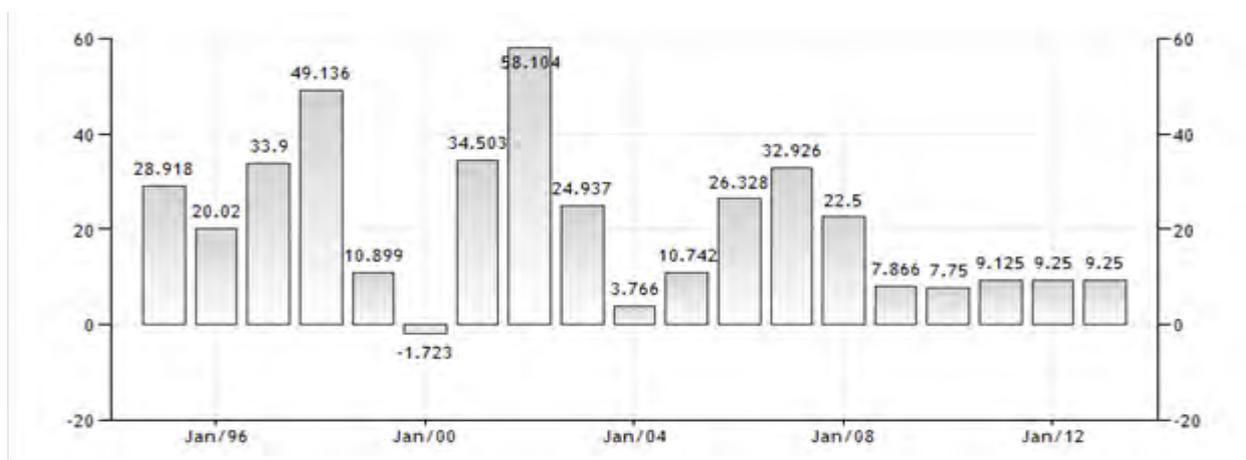
Myanmar has experienced severe inflation instability and extremely fluctuated exchange rates for the last two decades. In the last decade, as shown in the figure (1) and (2) money printing syndrome and other mismanaged factors of economy has caused the inflation to go up to 5\*% in 2002 and until 2008 inflation was above 20%. This in turn has triggered exchange rate instability as reflected in the movement in the unofficial or parallel exchange rate (Turnell 2011, 140). However, in recent years 2012 and 2013, the government has managed to lower inflation to single digit figures on the back of lower money supply growth from less deficit financing by the Central Bank of Myanmar (CBM).

Figure (1) Myanmar’s Inflation Rate (2011 and 2012)



Source: Tradingeconomics (2013)

Figure (2) Myanmar’s Inflation rate (1996 to 2013)



Source: Tradingeconomics (2013)

For more than five decades Myanmar's economy has been isolated by extreme inward looking policies and economic sanctions from the world's major players such as the United States of America, and European Union. As a matter of fact, the benefits of globalization left Myanmar's economy untouched. So the main growth factors of a country such as FDI, increased investments, that comes along with technology transfer and acquisition of knowledge of good practices in a wide range of sectors of public governance are still not in place in Myanmar's economy. This disengagement has resulted in weak institutions, comparing to its peers, such as Thailand, Vietnam, and other emerging economies, relatively low economic growth and high incidence of poverty. According to ADB prediction the potential economic growth rate of Myanmar is 4.0% to 5.0% per annum (Park et al. 2012, 20).

Asian development bank (ADB) (2012) survey conveys that exports sector of Myanmar are starting to make differences and FDI has also increased. Fiscal deficits are controlled at the level of 4% to 6% and inflation is being handled and kept as low as 4.2% in 2011. The annual growth rate, during 2000-2010, comparing to other countries: Cambodia, PCR, Indonesia, Laos, Malaysia, Thailand and Vietnam, Myanmar has been the slowest with 4.7% in the real terms (see Table (1)). However, ADB states that they are confident that the economic growth will pick up in Myanmar starting from 2013 with 6.5% and more in the near future. Similar to Cambodia and Laos, while there are only few private banks, Myanmar's very weak banking systems is still administered by the central control, central bank of Myanmar (CBM) and there are no foreign banks in the country yet (IMF 2012, 23). Undervaluation of revenues and distorted historical exchange rates left Myanmar in 2011 with high public debt level at 47.6% of GDP. In 2004-2010, even though militia billion dollar gas reserves has been contributing to the GDP, there must have some moral hazard factors as one can see the average tax-to-GDP ratio is only at 3.6% which is the lowest in Asian countries (Kubo 2012, 218). The resource curse factor in Myanmar is still a problem, in the fiscal year, 2011, from April to March; Myanmar has accumulated from Gas revenue for US\$1.5 billion, US\$1.3 billion in mining and gems, and US\$ 600 million in teak and timber exports though more than 70% of the labour force is employed by agriculture which is seriously facing the issues of paddy and pulses production (Turnell 2012, 140). Overall Myanmar's macroeconomic framework urgently needs to have the proper management as to work well with market mechanism (Takhun2012).

<b>Table 1. Economic Growth and Poverty Reduction</b>					
			Poverty headcount ratios		
Average annual economic			(at \$1.25/day)		
Country	Period	growth rate	Earliest	Mid	Latest
Cambodia	1994 – 2010	7.8%	48.6 (1994)	37.7 (2004)	22.8 (2008)
PRC	1991 – 2010	10.4%	63.8 (1992)	28.4 (2002)	13.1 (2008)
Indonesia	1976 – 1990	6.6%	62.8 (1984)		54.3 (1990)
Lao PDR	1994 – 2010	6.8%	55.7 (1992)	44.0 (2002)	33.9 (2008)
Malaysia	1976 – 1990	7.2%	3.2 (1984)		1.9 (1989)
<b>Myanmar</b>	<b>2000 – 2010</b>	<b>12.2% (Gov est.)</b>	<b>32.1 (2005)<sup>a</sup></b>		<b>25.6 (2010)<sup>a</sup></b>
		<b>4.7% (IMF est.)</b>			
Thailand	1976 – 1990	8.0%	21.9 (1981)		11.6 (1990)
Viet Nam	1994 – 2010	7.4%	63.7 (1993)	40.1 (2002)	16.9 (2008)

PRC = People's Republic of China, Lao PDR = Lao People's Democratic Republic.  
<sup>a</sup> Figures for Myanmar are from IHLCS 2011 and based on its national poverty line.  
Sources: ADB 2012; IMF 2012

## 2.3 Comparative View of Economic Development in Asia and Myanmar

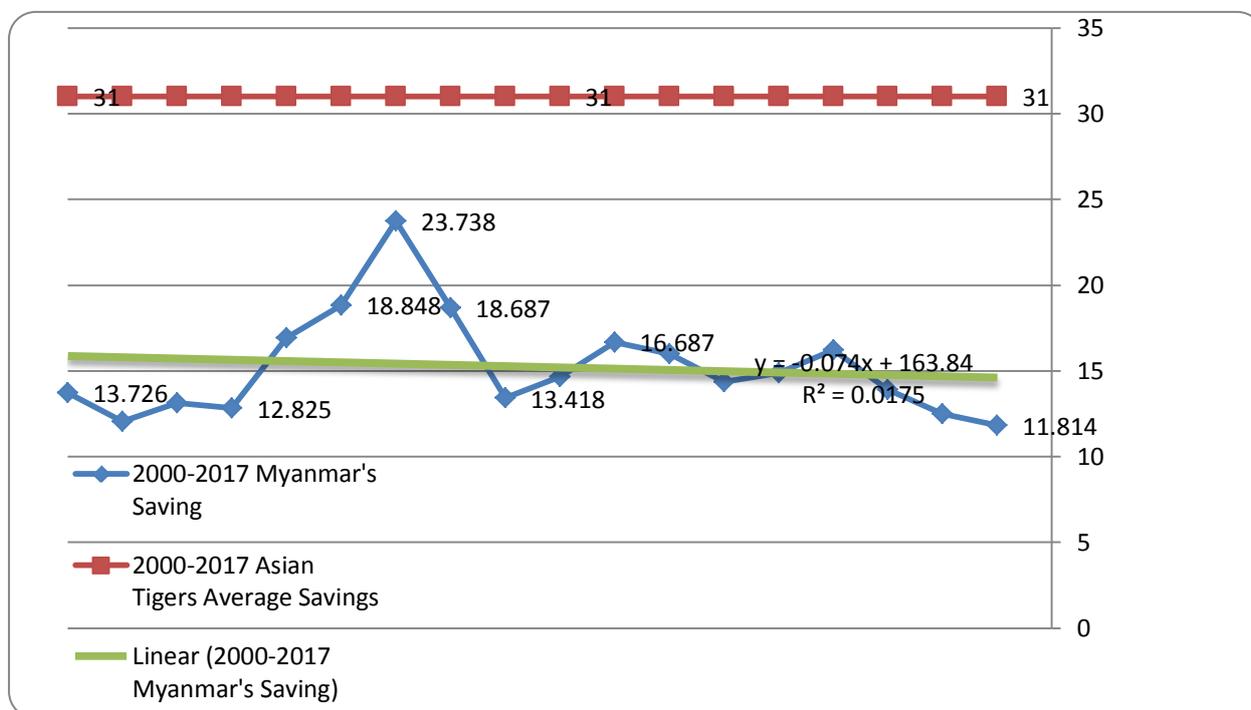
### 2.3.1 The first factor; Savings and Investments

For many decades, Myanmar's poor economic mismanagement led to the problems of domestic resource mobilization. Myanmar's official saving and investments rates<sup>1</sup> were lower when comparing to other Asian countries such as Thailand, Philippines, Malaysia, Korea and Indonesia. The Gross National Savings (% of GDP) for Myanmar in year 2010 was 15.376 % and Myanmar was ranked No. 113 in the world because the average saving rates of the world is 18.64 %, Myanmar is saving 3.26% less than the average (ADB 2013). The average rate of national saving rate is far lower even when comparing to emerging economies such as Thailand, Philippines, Malaysia and Indonesia in time of crisis as shown in the Table 2 (IMF 2013). When looking at the average national saving rate of Asian four tigers (Hong Kong, South Korea, Singapore, and Taiwan), they remained high at an average rate of 31% of GDP in the last decade (figure 3). According to the theory of saving and investment of Solow (1965), such a high level of savings could largely contribute as a key factor for long term development that in turn becomes high rate of economic growth,

.....  
1. The saving and Investment rates indicators here do not include the informal economic activities happened beyond the data estimations of ADB and IMF (2013). For instance; many Myanmar's business activities are still happening in the informal sector as Myanmar people do not save money in the banks and economic transactions are beyond measure.

and help prosper demography and the level of financial uncertainty faced by households.

Figure (3): Comparison saving rates of Myanmar and Asian Tigers



Source: IMF Country report (2013) and Author's own compilation

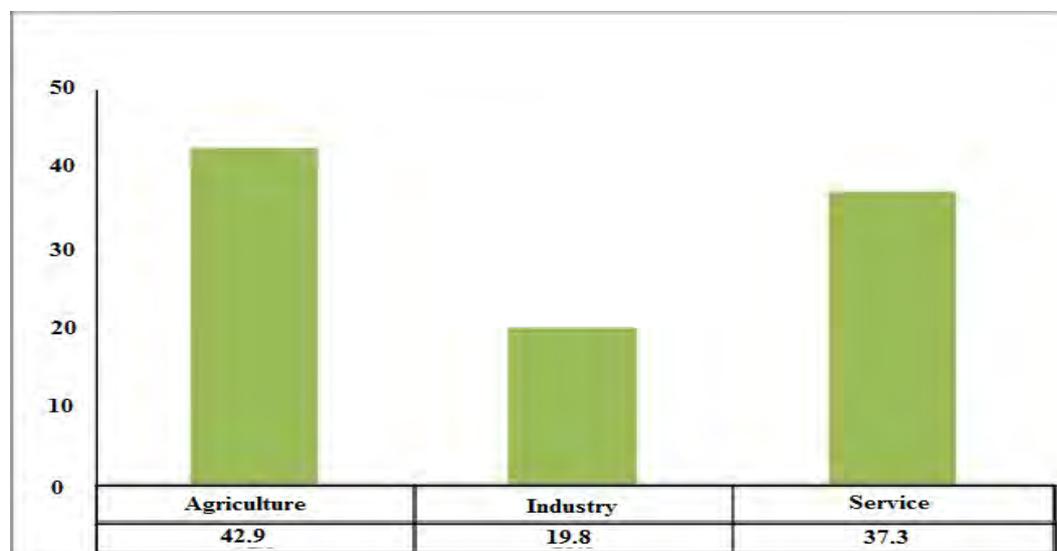
Table (2): Saving as a ratio to GDP of Selected East Asian Countries

Country/Year	Pre-crisis Period	Crisis-Period	Post-Crisis Period
	1992-96	1997-2001	2002-2008
<b>Thailand</b>	36.0	33.3	32.2
<b>Philippines</b>	14.5	15.1	20.2
<b>Malaysia</b>	39.6	45.6	42.6
<b>Korea</b>	36.4	34.4	31.6
<b>Indonesia</b>	32.1	27.8	27.0
<b>India</b>	22.9	23.6	32.1
<b>China</b>	38.3	38.6	46.4
<b>Japan</b>	30.3	26.6	23.7

Source: Asian Development Bank (ADB) 2010

### 2.3.2 Second factor: A Shift from Agriculture to Industrialization

Figure (4): Myanmar's Sectoral Distribution of GDP Employment as Percent of Labour Force in 2012



Source: Tradingeconomics (2013)

**Table (3) Sectoral Distribution of GDP Employment as Percent of Labour Force, Taiwan, 1955-1998**

	1955	1960	1965	1970	1975	1980	1985	1990	1995	1998
Agriculture	53.6	50.2	46.5	36.7	30.4	19.5	17.5	12.8	10.5	8.8
Industry	18.0	20.5	22.3	28.0	34.9	42.5	41.6	40.8	38.7	37.9
Services	28.4	29.3	31.2	35.3	34.7	38.0	41.0	46.3	50.7	53.2

Source: Taiwan Statistical Data Book (2001)

**Table (4) Myanmar's Export Quantity (Thousand Tons)**

	2001-02	2007-08	2008-09	2009-10
<b>Rice</b>	939	359	666	818
<b>Pulses</b>	1035	1141	1451	1141

Source: Myanmar Central Statistical Organization, 2011 and Statistical Yearbook Myanmar 2008

Most Asia economies were primarily dependent on Agriculture in their beginning phase of economic transition. It employed as high as 70 to 80 percent of the total labour force in

China, Vietnam, Thailand, and Malaysia after the Second World War. Detail of Taiwan's economy composition, shown in Table (3), depicts that the shares of employment by different sectors and their shifts as economy advanced towards more technology-oriented and service sector got more employment (Park 2002, 340). Analysing Myanmar's employment shares (as shown in the figure (4)) in comparison with Taiwan provides the clear figure of where Myanmar stands today in Asia's growth path. The agricultural sector in Myanmar still provided employment up to 70% of the country's work force in 2001 and 65% in 2012 as emerging economies had their time in the initial phase of economic transition. Rice was the only major agricultural produce, covering, and 60% of the total cultivated land area. Some other major agricultural products include beans, pulses, sugarcane, sesame, groundnut, teak, and fish (Park et al. 2012, 16).

From 2005 to 2010, per capita paddy and pulses production in Myanmar has significantly declined along with the price fall by half in real terms which makes many farmers worse off with diminishing incomes (Dapice et al. 2011, 4). Myanmar's rice and pulses export level has fallen sharply as shown in the Table (2). One may argue that increasing demand from increased population may also be the factor for falling exports because there were increasing rate of production (Table (3)) but it definitely did not contribute the country's GDP. After the exchange rate was floated in March 2012, rice exports ceased due to the lack of profitability as it is needed to undervalue the exchange rate for the favour of unproductive agricultural sector in Myanmar. Myanmar uses only 18% of land area for the crops and out of them only 18.5% is irrigated (Dapice et al. 2011, 17). Another factor was that of the farmer's difficulties of access to credit market. The government of Myanmar in 2009, provided the insufficient credits to farmers through the Myanmar Agricultural Development Bank (MADB) only 8000 kyat (Equivalent to 10 US\$) per acre which is only one tenth of the average cost of inputs for growing process while informal credit also costs 6% to 10% a month (The New Light of Myanmar 2012). As a matter of fact, instead of increasing productivity, farmers' incomes were reduced and have compounded more debt. On the other hand Myanmar's real export of rice and pulses are falling in 2011 as shown in the table (4) (Takhun 2012).

By looking at the data mentioned above, if we assume that Myanmar is still trapped in the agriculture-oriented economy, Myanmar really needs to gain surplus from Agriculture sector so that it can transit into industrialization. The other Asian countries experiences have pointed out that the new technology, be it higher yielding varieties or new methods of crop rotation and cropping systems, or improvement in irrigation and fertilization, controlling waste or the

waste management which accounts for more than 20% of the product, are the main factors to increase productivity in agriculture and gain the surplus. Consequently, labour intensive process of transplanting and weeding must be taken out from the process of production because of the lower crop prices and affected the labour market of farmers. The state of transition in Myanmar with such a large agricultural based economy needs surpluses to support the industry sectors with investment and labour. However, surpluses will be gained mainly from the higher productivity level with the help of technology and internal savings generated primarily from agriculture (Park et al. 2012, 30). It seems that Myanmar's economic policies are favouring more on the other side of the development and lacking the research and development for the higher yielding crops and causing the stagnation not to move to the industrialization.

### **2.3.3 Third Factor: Myanmar's Industry Sector**

All the growth theories and empirical studies have pointed out that Industrial revolution is necessary for any economic reform and if Myanmar is to achieve a high rate of GDP growth it is important that Myanmar will take necessary steps towards industrial reform. In 1960s and 1980s Taiwan and South Korea experienced double digit GDP growth primarily by improving their industrial sector. Similarly, the industrial sector lesson can be learnt from all countries from Asian Economies such as four tigers and Thailand, Vietnam, Malaysia and countries such as England in the eighteenth century as well as Japan in the early twentieth century and China today (Dowling and Valenzuela 2009, 70). They all have gained momentum in economic growth from low to middle income which then improved to high income status by focusing on industrial sector during their first decades of economic transition.

By looking at the figure (4) the ratio of industrial sector employment in Myanmar shows that Myanmar's industrial sectors need a lot of improvement to catch up with its peers. ADB (2012) suggested that since Myanmar has advantage of labour (high rate of unemployment), Myanmar should start with labour intensive industries. Concerning with manufacturing and industrial experiences, in 2000 Myanmar's garments briefly became the top export item, until U.S. sanctions imposed in 2003 caused a major decline in the garment industry (Turnell 2012, 65). According to IMF (2012) data, GDP in Myanmar is contributed largely by resource sector on the export of natural resource products, notably oil and gas but also gems and teak. The main problem derived from the natural-resource driven export is that when

those resources are sold and earn a large amount of foreign exchange and local currency is appreciated and difficulties encountered for both factories and farms to compete with foreign exports (Nehru 2012). These circumstances at least formed a barrier to the improvement of industrial sector as well as it lowers the income of farmers. On the other hand, to drive up the process of industrial revolution, it virtually needs to have many small and medium businesses as well as large scale factories established. In order to have new businesses entered into the market, banking sector's help or the access to loans must be easily available. However, Myanmar is now ranked the second-lowest in the world for the access to loans after North Korea (Vincent 2012). These factors are seriously deterring for start-up businesses or expanding the businesses, as well as making it hard for farmers to invest in inputs or to increase mechanisation. Another factor that crippled Myanmar's Industrial sector is the serious shortage of infrastructure. In fact, infrastructure is critical to a successful industrialization transformation, however, Myanmar is facing with transport infrastructure problems, electricity and water supply shortages (Park et al. 2012, 48).

Lewis-Fei-Ranis model (Ranis 2004, 545) suggests that when the productivity has increased from the agriculture because of the application of new technique and technologies as discussed above, the surplus labor and capital movement into industrial sector provides a net gain to the society. If the output of agriculture does not fall the food production will be unchanged and transferred workers will be fed by the agricultural sector that will in turn contribute to the output of industrial sector. Currently Myanmar government is focusing more on the improvement of foreign direct investment rather than investing more in agriculture to become more productive. In fact, if terms of trade move too strongly against the agricultural sector, industrialists will choke to death in the long run. The Asian industrialized economies started their process of economic transition firstly with import substitution but later focused more on the exports in labor intensive industries, such as leather, clothing, and textiles. These industries still have the linkages with agricultural sector. At the later stage of industrialization, these countries moved into more skill- and capital intensive industries (Dowling and Valenzuela 2009, 78).

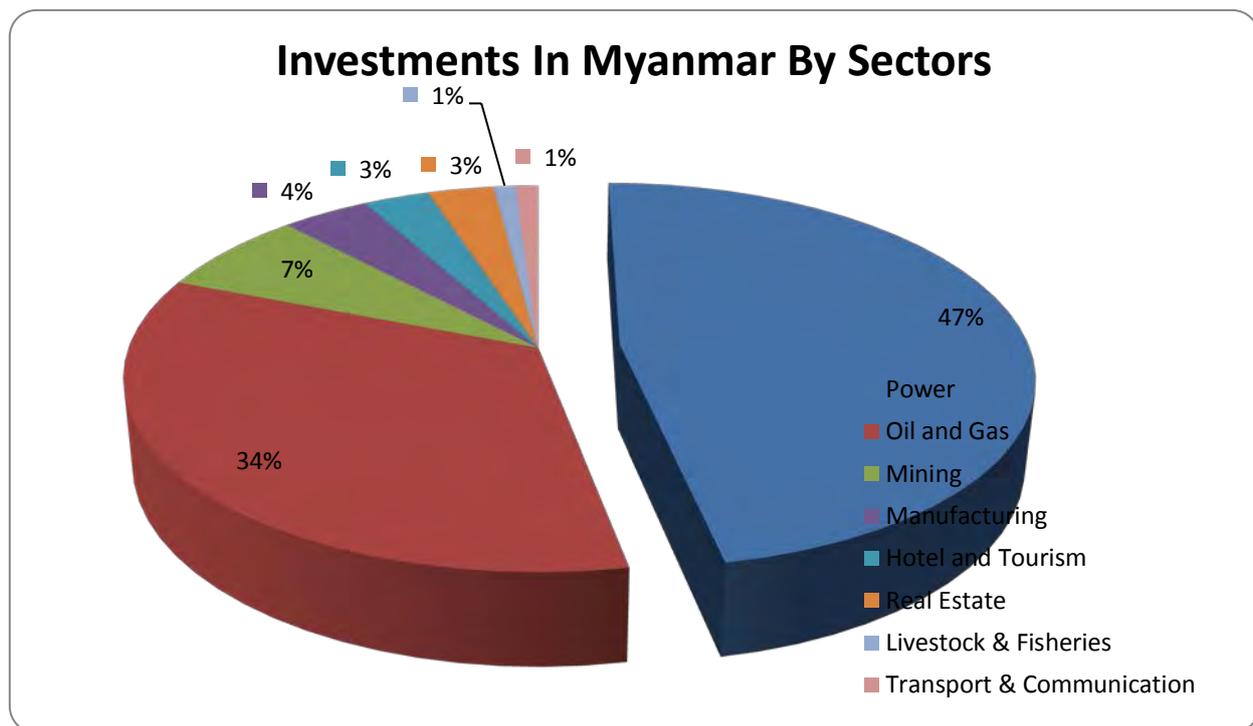
## 2.4 Reviewing Foreign Investment Law and FDI

Table (5) Foreign Investment in Myanmar in 2013.

No.	Country	No. of Enterprises	Approved Amount (US \$ Million)	% of FDI
1	China	33	13947.146	34.50
2	Thailand	61	9568.093	23.66
3	Hong Kong	38	6308.495	15.604
4	Republic of Korea	49	2941.289	7.27
5	U.K *	51	2660.588	6.586
6	Singapore	72	1804.013	4.467
7	Malaysia	39	977.461	2.428
8	France	2	469.000	1.169
9	U.S.A	15	243.565	0.6010
10	Indonesia	12	241.497	0.6011
11	The Netherlands	5	238.835	0.5912
12	Japan	24	216.220	0.5313
13	India	5	189.000	0.4714
14	Philippines	2	146.667	0.3615
15	Russia Federation	2	94.000	0.2316
16	Australia	14	82.080	0.2017
17	Austria	2	72.500	0.1818
18	United Arab Emirates	1	41.000	0.1019
19	Canada	14	39.781	0.1020
20	Mauritius	2	30.575	0.0821
21	Panama	1	29.101	0.0722
22	Viet Nam	2	23.649	0.0623
23	Germany	2	17.500	0.0424
24	Denmark	1	13.370	0.0325
25	Cyprus	1	5.250	0.0126
26	Macau	2	4.400	0.0127
27	Switzerland	1	3.382	0.0128
28	Bangladesh	2	2.957	0.0129
29	Israel	1	2.400	0.0130
30	Brunei Darussalam	1	2.040	0.0131
31	Sri Lanka	1	1.000	0.00
	Republic of Liberia**	2	14.600	0.04
Total		460	40431.454	100.00*

Sources: Myanmar's Federation of Chambers of Commerce and Industry (MFCCI), Statistical Data, 2013.

Figure (5) Investments in Myanmar by Sectors 2013



Source: Oo, Aung Naing. 2013 (Deputy Director General, Directorate of Investment and Company Registration.) Myanmar's Federation of Chambers of Commerce and Industry (MFCCI).

Myanmar's Federation of Chambers of Commerce and Industry (MFCCI) released an announcement that China's investment was 34 percent of the approved FDI in Myanmar as of the end of January 2013 which was followed by Thailand at 23 percent, Hong Kong at 15 percent and South Korea at 7.1 percent (Table (5)). While 34 Japanese firms have had their investment plans approved, they together account only for 0.64 percent of the total FDI amount (Oo, 2013). In 2<sup>nd</sup> November 2012, Myanmar's new Foreign Investment Law (FIL) has been enacted. New FIL guarantees that foreign companies investing in Myanmar within its restrictions will receive tax and other benefits. FIL allows that an entity may be 100% foreign own but may also form a joint venture between a foreigner and state owned organization or a Myanmar citizen. The new FIL now announces that no foreign investment will be nationalized during the term of, including the extension of, the Myanmar Investment Commission (MIC). Even in the United States of America, a foreign investment could be nationalized with subject to market value compensation under the name of eminent domain. Notwithstanding the fact that new FIL in Myanmar lift certain barriers and bestowed with

incentives to the foreign investors, there still remains few questions such as in the investment approval process and the extent to which investments will be allowed in the restricted area (The President Office 2012). ADB (2012) states that, Myanmar's economy is now trying to catch up with Bangladesh. Myanmar still lacks sound regulatory environment and trained workforce to attract FDI. However Myanmar biggest barrier to FDI and foreign investments is of poor infrastructure. Currently Myanmar still faces the serious shortage of electricity. On the other hand lacking the proper transport systems and high cost of logistics is also enforcing the transaction costs for any trades (Ferrarini 2013, 20). Myanmar's new FIL is great from the perspective of foreign investors but still needs the law enforcement for the regulations to become effective. Floating exchange rate brought the stabilization of the exchange rate and inflation however as foreign currencies are flowing in, which hurts exporters, especially rice exporters. Kubo (2012) pointed out that Myanmar kyat was trading at about 1,300 kyats per US dollar per unit in 2007 which made farmers great for export but now it is trading at 860 kyats per US dollar unit in 2013 January (IMF 2013). However one may argue that in the transition process, there is short term tradeoff between developments of economy, which is based on the stabilization of inflation and exchange rates, and lagging sectors such as export but in the long run self-correcting mechanism will come into play if Myanmar is really heading towards free market mechanism.

## **2.5 The Role of Governance and Policy Implementation (A Barrier to the Development?)**

When looking at economic development pattern of the country, the role of the good governance is the primary source for the great process of transition in any economy (Boeva 2002, 15). Myanmar is now facing a tremendous change, a shift in the dimension of governance from a centrally controlled system, a military dictatorship to a democratic system. IMF (2013) pointed out in their report that there are reasons for continued hope in Myanmar. If Myanmar can manage to overcome some hurdles, its potential for growth in social and economic is undeniable. The new government has departed from the Myanmar's decades-long bad governance pattern which was known as repressive and over centralized. It brings out the hope of many that the political stalemate that has portrayed Myanmar's image, political system and economy as bad as one of the World's lowest is eventually making a progress towards more constructive mechanism.

However, the new democratic government has inherited the problems of ethnic conflicts and poverty, inequalities, infrastructure shortages and an economy that is stagnate and distorted. Decades of poor governance that could not stimulate economy and investment as well as human resource capacity building has somehow formed the deficiency in assessing the problems and challenges. Most of the economists agree that economic growth will not be sustainable without increased national cohesion that is constructed on the widely shared platform of equality and peace (CGA 2012, 35). Notwithstanding the goodwill of the 2008 Constitution in Myanmar ; article 21 which imply that ‘every citizen shall enjoy the right of equality, the right of liberty and the right of justice’, the Report of the International Bar Association’s Human Rights Institute (IBAHRI 2012) found out that most people in Myanmar think their justice system as a failure. It is still remain very much in doubt that the administration of justice is independently operated according to law; and the matter of the dispensation of justice in open court unless otherwise prohibited by law. Moreover people are still in doubt of the article 19 which mentioned that a guarantee in all cases of the right of defence and the right of appeal under law. When government is making a positive change towards free market system and better political outlook, it is very important to maintain that all the implementation steps are smoothly undertaken. While polices and Judges in Myanmar are still considered corrupt and too close to the cronies and officials, the law enforcement bodies are generally viewed as unfriendly and the judicial process as costly and daunting.

In fact, in this transitional stage, ‘Myanmar’s political landscape has done too little as yet to change the lives of ordinary people’ (IBAHRI 2012). For economic development of any country, the proper law enforcement and established rights are necessary. According to the Bangkok Post (2013), Myanmar’s political landscape has changed the headlines towards the economic development and poverty reduction; however all the government officials are still tied to the old habits of bureaucratic red tape system and corruption is still in practice. It implies that Myanmar is still stuck in the implementation steps of the political, social and economic changes.

In this case, regulations not only for effective checks and balances, that reduce the corruption and power accountability that are contrary to the national interest, are essential but also the evaluation of the policy implementation is necessary.

## 2.6 Economic Development Paradigm

In general, development strategy of East Asia was much more of the state-led and top-down economic policies with reluctant steps to trade liberalization until 1990s. Countries like Singapore and Taiwan also acquire foreign technology by promoting FDI, foreign licensing and liberalization of foreign direct investment (Park 2002, 348). After 1960s, reform minded Asian countries started to adopt import-substitution strategy which was, in 1970s, developed into export oriented strategy. Manufacturing sector has given a head start to Japan and Korea in 1970s with the share of GDP above 30% while ASEAN countries such as Thailand and Malaysia were catching up slowly. However in 1970s sleeping dragon 'China' has emerged into the one of the labor-intensive industrial, export-led country. The time coincide with the comparative advantage movement and by 1980s china's high speed industrialization absorb a lot of foreign direct investment as well as the large share of export to the world. There was a paradigm shift in the industrialization process in most Asian countries in mid 1980s as comparative advantage moves along with the wages, educational level and availability of labor as Japan, Taiwan, Singapore, Korea moved into technology and knowledge intensive industries as automobile, high quality electronics and machinery (Dowling and Valenzuela 2009, 180). The second tier industrialized east Asian countries; Malaysia, Philippines, Vietnam, Thailand have also transformed their low wages advantages into becoming a spill over industrialization such as producing electrical appliances such as television, refrigerator, washing machine, car parts, and electronics while China compete with the wage and availability in the labor intensive market.

Ironically, against the conventional economic development theories that countries such as Japan, South Korea, Asian Tigers did not firstly formulate economic strategy to rely on the international investments and did not reduce barriers to trade and capital flows (Chow 2010, 125). In the very first phase, most of the economic development theories that focus mainly on agricultural surplus transfer to industrialization are proving difficult in implementation because of the low profitability of agriculture and costly to build infrastructure such as proper irrigation systems well as research and development, and excessively complex nature of improving productivity of agriculture (Park 2002, 350).

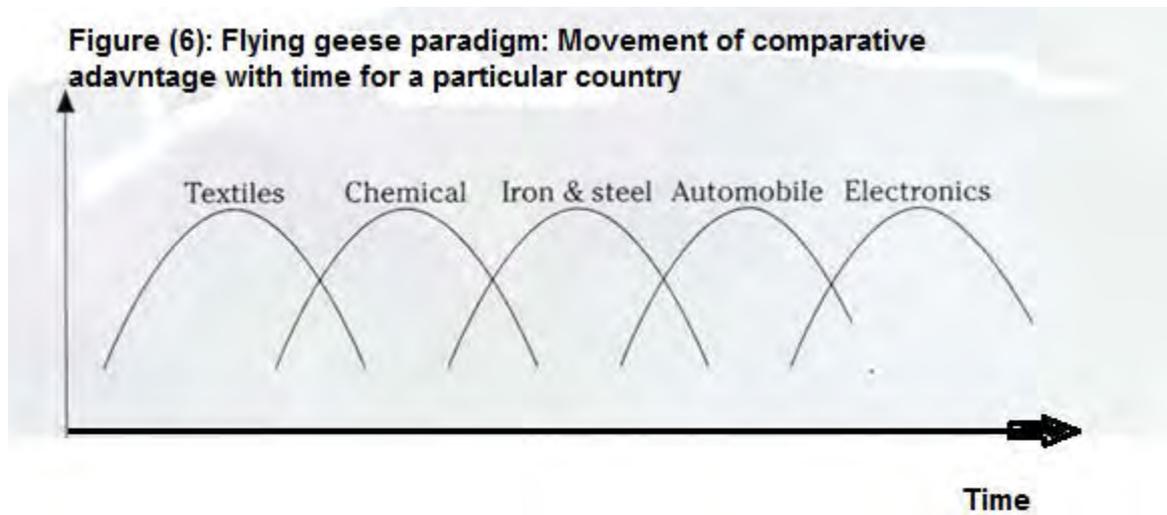
During 1980 to 1996 East Asian Countries, including some ASEAN countries and China have increased the world's share of manufactured products from 18% to 29%. Further shift from the foreign direct investment from Korea, Taiwan and Japan also help improved the terms of trade in these regions (Dowling and Valenzuela 2009, 79). Most Asian economies

advance towards next level and shift their comparative advantages from agriculture to labour intensive industrialization and then transform them to value added industries and technological oriented industries.

In fact, the governments of these countries were the key drivers of the economic growth (Stiglitz 1996, 151). There were some common themes in the economic transformation and the success stories of these countries such as having high rates of saving and investments, export oriented development policies, suitable industrial policies, human capital enhancement by investing in the education for the technological advancement. However, Park (2002, 345) argued that there is no one-size-fit-it-all formula for economic development of different countries with different culture, belief, region and people. He differentiated in five different categories such as Japan's pattern of industrialization closely followed by South Korea and Taiwan mainly focus on exports and completely opened free ports of Singapore and Hong Kong, FDI led export growth in Thailand and Malaysia and China's open door policy with combination of labour intensive and capital intensive industrialization.

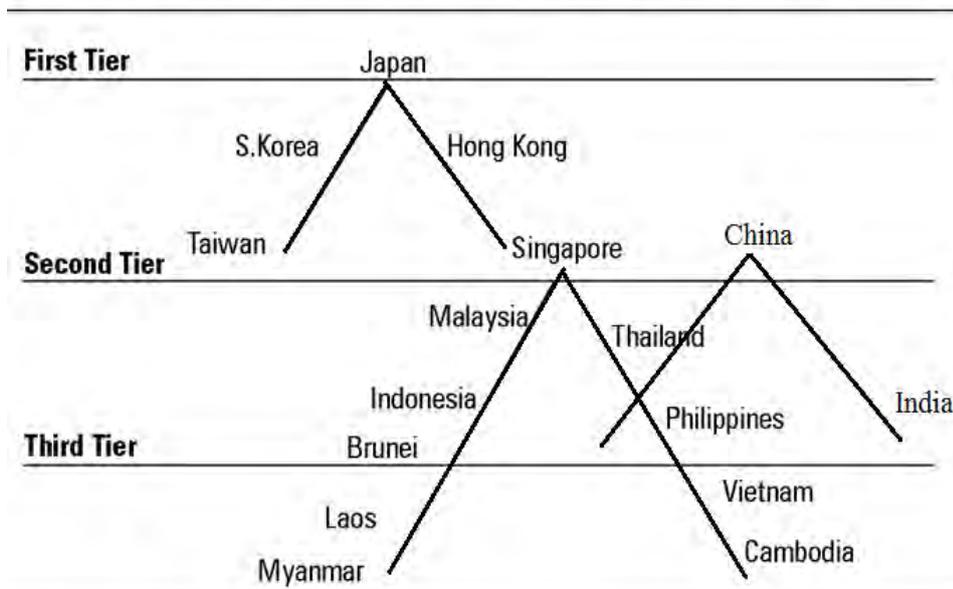
Figure (6) is showing the infamous work of Akamatsu's (1962) flying geese paradigm which was later developed into East Asia pattern of industrialization and the movement of comparative advantages from one country to another starting. In the first stage, domestic imitations cannot compete with foreign imports, therefore imports remain high. With effective protective policies, domestic industries start to facilitate the acquisition of necessary technology know-how and produce the better quality consumer goods and products. As a result domestic demand will grow and start to engage in the large scale industries. Then exports begin in the next phase. Then FDI increases as the infrastructure, and the overall economy improves towards next level with better education of the workers. In this stage, the country will become ready to go to next level as comparative advantage of the advanced economies began to lose. With proper outward looking policies, industries begin to gain global access and gain maturity and again began to increase the production costs and intensified the competition from late comers. As in Japan, economy slows down at this stage as exports decrease, costs of production become very high and industries relocate to another country in order to survive (Dowling and Valenzuela 2009, 201). As shown in the figure(7) from Japan, to Hong Kong, Taiwan, South Korea, and Singapore through the establishment of local production facilities to the emergence and growth of exports and which later their comparative advantages moved to second tier, Malaysia, Thailand, Indonesia, Philippines and Brunei. In the last tier there is Vietnam is at the lead and Cambodia, Laos and Myanmar are following behind. For Myanmar, however, is clearly at the stage of beginning phase of

industrialization which needs to gain surpluses from agriculture as well as from intra-regional trade and labor intensive industries such as textile, pulps, beans, rice, and rubber and so on. Being at the bottom line of the flying geese pattern, Myanmar government needs some effective policies to encourage the domestic industries and agriculture.



*Source:* Yamazawa's framework as presented by Dowling and Valenzuela 2009,70.

**Figure (7): Flying Geese pattern, Comparative Advantage Movements of Selected Asian Countries**



**Source:** Different tiers from Dowling and Valenzuela 2009 & Author's own compilation

## Chapter (3): Empirical and Theoretical Review

### 3.1 Overview

Most of the economic policy analysis for economic growth of a country rely on the growth models such as the work of the Harrod-Domar Growth Model or the exogenous growth model (Domar 1946), Lewis-Fei-Ranis model (Lewis 1954; Fei and Ranis 1961), Solow-Swan model (1956), the endogenous growth theory by Romer (1986) and Lucas (1988) and Cobb–Douglas production function (1927–1947). According to Todaro & Smith (2003), they are analysed into four different groups; (1) the linear-stages of-growth model, (2) theories and patterns of structural change, (3) the international- dependence revolution, and (4) the neoclassical, free-market counterrevolution. In this section, they are explained and briefly analysed in the context of Myanmar and suitable methodology for this paper is chosen.

### 3.2 The linear-stages of-growth model

Among the linear stages of growth models, the Harrod–Domar model explains the rate of economic growth by the level of saving and productivity of capital. The main theme of Harrod–Domar model (Domar 1946) is that the output growth rate is equal to the savings rate multiply by marginal product of capital minus the depreciation rate as shown by mathematical formulation below.

$Y = f(K)$  = Output is a function of capital stock

$sY = S = I$  = The product of the savings rate and output equals saving, which equals investment

$\delta$  = depreciation

Therefore,

$$\Rightarrow \dot{Y} = sC - \delta$$

It means that in order to achieve growth, the country needs to increase the level of savings rate, the marginal product of capital, or decreasing the depreciation rate. The main criticism on this model is to form a constraint on the development because of the savings and low level of capital formation for the most underdeveloped countries, especially in Myanmar. Harrod-Domar model implicitly assumes that all the third world countries would be at the same institutional level and ability as in Europe (where Marshall plan in 1948 has worked to some

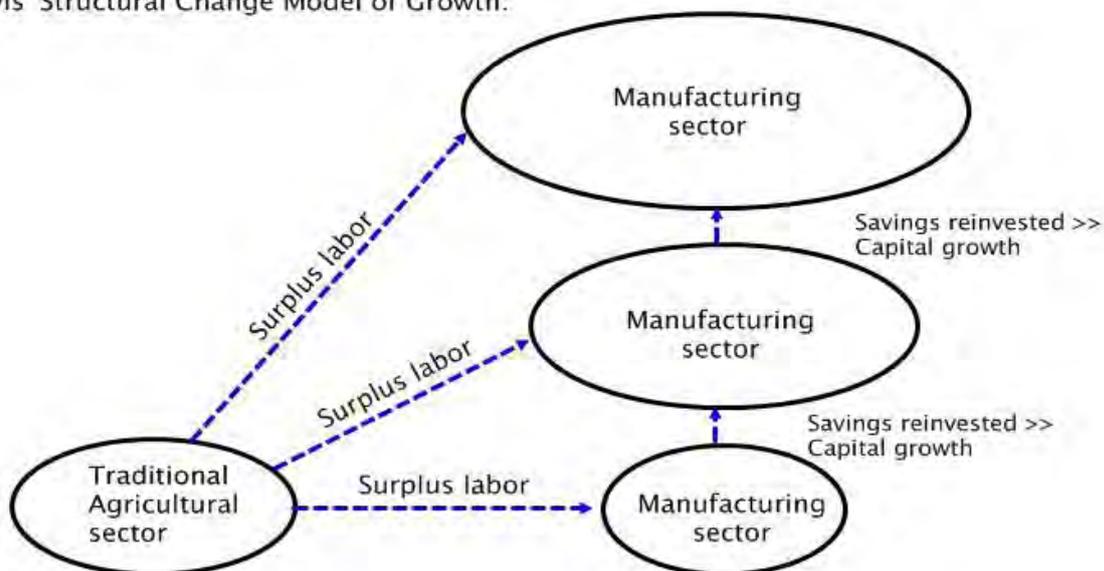
extent ), such as with well trained and educated workforce, workable infrastructure, mobilizing banking system and well integrated commodity market. However, it is not necessarily the case in Myanmar as the country is still lacking all the elements and drivers of economic growth.

### 3.3 Structural Change and Patterns of Development

Structuralist development pattern or Lewis-Fei-Ranis model (Lewis 1954; Fei and Ranis 1961) focuses on the shift of the surplus labour and capital from the agriculture and urban migration for the labour surplus. Starting from the point of transformation of production with a change of consumer demand, getting involved in the international trade, better management of resource allocation is the main theme of the pattern. In this pattern a strong shift from agriculture to industrialization with surpluses of agriculture and accumulation of physical and human capital, the change in the nature of consumer demand from the food and basic necessities to manufactured goods and services. It enhances the urban migration from rural to cities as well as a decline in population growth as economic growth rate begin to accelerate.

Figure (8) Lewis-Fei-Ranis’s Structural Change Model of Economic Growth

Lewis' Structural Change Model of Growth:



Source: Ranis and Fei (1961).

However, this model of development has been questioned by the critics. It assumes that the labour transfer and employment creation in the modern sector is proportional to modern sector capital accumulation. The question; if education of the rural workforce cannot cope with changes or if the profits of reinvested capital are more on technological-labour-saving

equipment, what would happen to the assumed surplus transfer, definitely shake the confidence of this model.

### **3.4 The international-dependence and false-paradigm model**

From another perspective of economic development history, perhaps of neo-Marxist view, international dependence theory holds much more a negative view of foreign influences on any country's economy. It states that in the process of transition to another stage of economic development from being underdevelopment needs the condition of trades that are influenced by other major players who often exploit the benefits of the third world countries opportunity for their own interest (Todaro and Smith 2003, 123). By extending this theory to Myanmar which still has the influence of landlords, military rulers, entrepreneurs, and cronies, salaried public officials who enjoy high income and power as well as a social status in the economic decision making. They are formed as an elite ruling class whose primary concern are mostly not in the benefits of the majority of Myanmar people and in the name of capitalism, they might exploit the economic development of others without sharing to the majority so that the inequality gap will grow over time. Moreover, multinational institutions and organizations, such as World Bank, International Monetary Fund, Asian Development Bank whose survival depend on the donation of major player countries are somehow tied to the elite group from the inside. According to this theory, activities and viewpoints of such stakeholders might not represent the genuine transition to a better state for majority of the population.

The false-paradigm model, stress more on the well-meaning but faulty advises or theories put forward by the educated advisors. Those theories are later turned into wrong policies in the economic development. Experts in economic normally formulate the growth models for the underdeveloped countries with the help of theories, complex econometric technique and concepts (Todaro and Smith 2003, 125). However, most of the advisors are trained in the developed countries setting and their way of thinking and the background of the economic structure are apparently very different. As Myanmar, where there has no proper banking system, is different with the problem of tribes, believe, cultural context, wide gap of inequality, unequal access to credit and form of governance which shape the of economic policies that favour more on the existing powerful elite as well as the benefit of international powers.

International dependence and false-paradigm models have some major weaknesses. They are mainly concerned with the explanation of why poor countries remain poor but do not care to explain how economies can grow over time and sustain development. The experiences of East Asian economies mentioned in chapter two is the opposite result of these theories. Moreover, in overcentralised countries such as in many Asian countries including China and Myanmar, most of the state run productions or industries are never up to the optimum level of the output and facing loss over time.

### **3.4 The Solow-Swan Growth model**

The Solow-Swan Growth model or otherwise known as the neoclassical growth model explain the growth of a country by factoring population growth, productivity, capital accumulation and technological progress. The Solow-Swan model approach is mainly focused on the constant returns to scale and diminishing returns to investment. It indicates that there is a steady-state growth path for a given rate of population growth and saving (Swan 1956). It implies that in the long run income per capita levels might converge and the differences in income levels of different countries will become narrow. Output per worker is due to the function of capital per worker (Solow 1956). The amount of per-capita capital in the current period depends on the per-capita capital in the last period, the saving rates of the past and the growth of population. Starting point of Solow Swan model is the  $Y/L = F(K/L)$ , which can be re-described as  $y = f(k)$ . This is shown in the diagram below with a blue curve. The production function assumes diminishing returns to capital in this model, as denoted by the slope of the production function.

$y$  = output/income per worker

$L$  = labour force

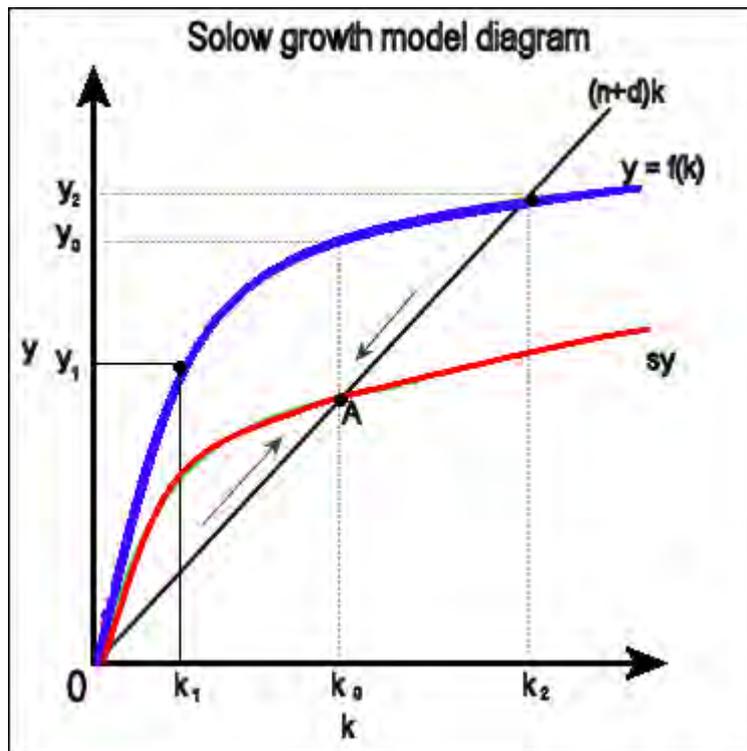
$n$  = population growth

$d$  = depreciation 'δ'

$k$  = capital per worker

$s$  = saving rate

Diagram (1) Solow Growth Model



- As was termed by Solow (1956), the ‘steady state’ in the diagram is the intersection point ‘A’ while total output growth is depending on the rate of ( $n$ ) population growth.
- For example (as shown in diagram (1)), at point  $k_1$ , capital per worker will increase because the saving per worker is greater than a steady state level of capital which makes the output increased and form the capital deepening from  $y_1$  to  $y_0$ . However, on the contrary, at point  $K_2$  for example, output per worker is falling from  $y_2$  to  $y_0$  because as the capital per worker is falling and investment cannot sustain population growth and depreciation.

The main defect of this model is that there is no empirical evidence for convergence and the existence of the large unexplained ‘residual’.

Because of this consideration that is lacking in Solow-Swan model, Romer (1986) and Lucas (1988) refreshed the theory in new perspective and called ‘the endogenous growth theory’. It includes the assumption of increasing or steady returns to a factor input especially of human capital. That is why it was able to explain the income convergence, the residual factor and the lack of growth in some cases.

### **3.5 Jalilian et al. (2007)' methods of Regulatory assessment**

International trade to the country and FDI, which is solely dependent on the conditions of regulations and institutional capacity other than the basic infrastructure, are the key factors to stimulate the economy. Therefore, the effects of the regulations, regulators largely contribute to the development of economy (Jalilian et al. 2007,92). If we are to presume that Myanmar is now having the a genuine transition led by the new democratic government and heading towards the genuine economic reform, and the only thing it makes lagging behind its anticipated development is probably the regulatory steps or regulations implemented by the officials. The empirical study done by Jacobs (2004, 30) mentioned that 80% of regulators of 13 Asian countries had received no proper training for their regulations. He also made a point that most officials from underdeveloped Asian countries are unsupported and under trained, ill-equipped for executions and implementations of the policies that are framed by the government. Since the quality of the governance structure of the country and its institutional ability define the amount of investment made on the economy as well as productivity (Stiglitz 1998,12), empirical studies with regression analysis have pointed that the improvement of regulatory steps in the governance structure will result on the higher per capita income in the long run.

### **3.6 The Cobb-Douglas production function**

When analyzing a country's economic growth, the Cobb-Douglas functional (1900-1928) form of production function is the key theory still in use by many researchers. It mainly describes the relationship of an output to inputs.

It can be expressed as  $Y = T * L^a * K^{(1-a)}$

where:

Y is real output

T is total factor productivity

L is a measure of the flow of labor input

K is a measure of the flow of capital input

“a” is a fractional exponent,  $0 < a < 1$ , representing labor's share of output (described below)If we add up land and energy to the above equation more general form of the function

would be  $Y = T * L^a * K^b * T^c$  where T is a third input (land, energy); and as for Cobb-Douglas function, the fractional exponents (a, b, and c) must sum to 1 (Douglas 1976).

### **Constant Returns to Scale**

The Cobb-Douglas production function assumes the constant returns to scale (CRS) which means that any proportional increase in both inputs results in an equal proportional increase in output. For example; if we have double increase in both L and K inputs will result in double the Y real output. In fact, the fractional exponents on the input variables might be (when added together) less than one which indicates the decreasing returns to scale or greater than one which means that economy is gaining increasing returns to scale or economies of scale. Because of this simplicity and clear indication, The Cobb-Douglas production function is often used with the log-linear transformation and employed to econometrically test for returns to scale to determine the economy of scale or the growth.

### **Total Factor Productivity**

If we re -write the above equation, we get

$$T = Y / L^a * K^{(1-a)}$$

This formula is a better measure of productivity than Y/L, Y/K, or Y/I which are measures of only partial productivity of the economy and they do not consider the possibility of differing contribution of other inputs used in production which might be greater or lesser productivity of as a single input.

Moreover, technology Growth and Efficiency are two main variables that contribute the Total Factor Productivity as a driver of economic growth. Many researchers agree that Total Factor Productivity is the real driver of growth within an economy. While labor and investment are important contributors, Total Factor Productivity may account for up to 60% of growth within economies (Dowling and Valenzuela 2009, 35).

## **3.7 Reconciliation of the Different Methods**

Different models mentioned above represent different time frame and different situations for the development of an economy. For example, the linear-stages model focus more on the sustainable long run economic growth decided by the factors of saving and investments. Structuralist view of sectoral shift from agricultural to industrialization and modernization

emphasis more on the linkages of the sectors and the surpluses transfer which is also a proven factor in China (Park 2002, 345). The international-dependence and false-paradigm model also address the different point of view that we should be carefully examine about the growth models proposed by the intellectuals and power elite as the gains or the economic development achieved may not be shared by the majority of the people in the country. Solow-Swan Growth model or otherwise known as the neoclassical growth model gives more attention to the population growth, productivity, capital accumulation and technological progress for economic growth. If we can add up some more variables to this model such as mobilizing market, functioning price system, income distribution factors, it may become a theory of development close to perfect. Researchers like Jalilian et al. (2007) has differently criticize the government's economic policy by methods of Regulatory assessment and rightfully pointed out that regulation implementation improvements can attract a lot of foreign investments as well as enhance the efficiency in the market.

The Cobb-Douglas production function underlines a country's economic growth with relationship of an output to inputs. It is probably the most simple and useful theory among economic growth Theories. To analyse the empirical research data and multiple exponential error, Cobb-Douglas function can be used as linear function in logarithmic form and the result can point out either decreasing or increasing or the constant returns of scale. It can also determine the amount of output by the variables of inputs and capital. It also mentions the importance of total factor productivity.

In the accredited paper of Jalilian et al (2007), titled, 'The Impact of Regulation on Economic Growth in Developing Countries: A Cross-Country Analysis', seeks the answer of the role of the state regulation with an econometric model of the impact of regulation on growth. In their paper the simple model they employed was Cobb–Douglas production with each country's production possibility set. Another country specific economic growth study in Fiji, done by Narayan & Smyth (2010), also employed the Cobb-Douglas production function as the core model to underline the effect of trade liberalization and the economic growth in Fiji.

### **3.8 Empirical Test Methodology of Narayan & Smyth (2010)**

Narayan and Smyth (2005) examined the economic performance of Fiji by employing Cobb–Douglas production function as a main theory. In their study, the trade liberalization which was the key factor of their paper was tested with econometric methodology. The Cobb–

Douglas production function was also in consistent with other previous studies such as with the studies of Abhayaratne, 1996; Chuang, 2000; Hossain & Chung, 1999; and Ramirez, 2000. They used the bond testing approach to cointegration of Persaran & Persaran (1997). The method is called Autoregressive Distributed Lag (ARDL) framework. The ARDL cointegration test analyses the comparison of the F-statistics against the critical values, which is generated for specific sample sizes. It can also be employed with a small sample size. They also employed the time series annual data to carry out the test. They have estimated the three different models for Fiji's trade liberalization and economic growth. The models were tested in the form of log in order to have the linear outcome. The variables they tested were  $\ln$  GDP for real gross domestic income,  $\ln$  Lab, for the labour force,  $\ln$  Exp for exports,  $\ln$  Edu for the secondary school enrolment rate.  $\ln$  Inv for the ratio of total investment to GDP,  $\ln$  Tax for tax .

In order to know the changes and effectiveness of the economic policy in Fiji, they employed dummy variables; D84 for the date Fiji officially signed the IMF structural adjustment policies (representing year 1984). It takes the value of one from 1984 onwards and zero Otherwise. Another dummy variable is D86 to test the changes after 1986 after the implementation of the policy and there is also another dummy Coup for the political coup happened in 1987 and 2000 and  $\epsilon$  is an error term. They also employed the data from (IMF) International Monetary Fund, World Bank; the Reserve Bank of Fiji and Fiji Bureau of Statistics.

Their result after the test implies that trade liberalization in Fiji has not contributed much for economic growth. They have mentioned that it was the expected answer as Fiji has experienced the political coups and hardships.

## **Chapter 4: Data and Methodology**

### **4.1 Introduction**

This chapter is composed in three different sections as follows. In the section 4.2, sources of data are addressed while section 4.3 is reserved for methodology. Section 4.4 explains meanings and the hypothesis of the variables employed in the models. Section 4.5 outlines the econometric model and empirical specifications as well as the procedures of estimation, which is consistent with several previous studies (Narayan 2010, Abhayaratne 1996; Chuang, 2000; Hossain & Chung 1999; and Ramirez 2000), on the effects of changes of economic policy since U Thein Sein Government has sworn in. Employing the frame work initiated by Narayan 2010, this section explicitly examines the question whether the economic policy of Myanmar is heading towards the right direction

### **4.2 Data**

Whenever it comes to research in the topic of Myanmar economy, researchers are confronted with the problems of scarcity of reliable data as the country's has long been governed by the negligent dictatorship (Turnell 2011, 95). Two of the three central methods of data collection in mixed method research, namely secondary data and document analysis were utilised in this study. The retrospective nature of the analysis and short time frame precluded the use of the third central technique, field observation. In this paper, the main emphasis is given on the economic policy effectiveness of the new government rather than other variables. The suitable variables used for this research are the real GDP (gross domestic income), the labour force, real exports, the ratio of total investment to GDP, secondary school enrolment rate, government revenue (Tax). The sources of time series data set are from the World Bank, IMF (International monetary Fund) and Asian Development Bank (ADB), The United Nation Educational Council, Central Intelligent Agency (CIA) world fact book are the main sources that most data are collected from. In order to get linear function, the data set is put into the logarithmic form and analysed by the econometric regression method.

### **4.3 Methodology**

Narayan and Smyth (2010) proposed a test for the trade liberalization and economic growth using Cobb-Douglas function which is consistent with the purpose of this paper when changing the variables. Explanatory variables to measure the effectiveness of economic liberalization in Myanmar are the labour force, real exports, the ratio of total investment to

GDP, secondary school enrolment. In this paper two different versions of models are composed using time series data for the period of 1998 – 2017. The models are

Model 1:

$$\ln \text{GDP}_t = \alpha_0 + \alpha_1 \ln \text{Lab}_t + \alpha_2 \ln \text{Exp}_t + \alpha_3 \ln \text{Edu}_t + \alpha_4 \ln \text{Inv}_t + \alpha_5 \ln \text{Tax}_t + \varepsilon_{1t} \quad (1)$$

Model 2:

$$\ln \text{GDP}_t = \beta_0 + \beta_1 \ln \text{Lab}_t + \beta_2 \ln \text{Exp}_t + \beta_3 \ln \text{Edu}_t + \beta_4 \ln \text{Inv}_t + \beta_5 \ln \text{Tax}_t + \beta_6 Y_{11t} + \varepsilon_{2t} \quad (2)$$

Where,

$\ln \text{GDP}$  is the natural log of real gross domestic income

$\ln \text{Lab}$  is the natural log of labor force

$\ln \text{Exp}$  is the natural log of real exports

$\ln \text{Edu}$  is the natural log of secondary school enrolment rate

$\ln \text{Inv}$  is the natural log of the ratio of total investment to GDP

$\ln \text{Tax}$  is the natural log of tax revenue

$Y_{11}$  is a dummy variable of the year on which new democratic government has started the economic reform. It assumes the value of one from 2011 onwards and zero otherwise.

And  $\varepsilon$  is the error term.

The main strength of the model adopted from Narayan and Smyth (2010) is the modification of the Cobb-Douglas production function and including the variables such as real exports, tax, and investment that explain the growth of economy and development of the country and the human development index is explained in the model by the education factor.

#### **4.4 Hypothesis**

This study is about the economic policy and its effectiveness focus mainly on the GDP and education, standard of living, poverty reduction and other proxies. The proxy for the change of the economy of Myanmar used in this paper is the  $Y_{11}$ , a dummy variable which investigate the change of the economic policy of the country along with the new government. However, given the short time frame of 2011-2017, the impact of the policy change may or may not yet be felt by the economy. Many of the papers from IMF and World Bank as well as

ADB bank generally mentioned Myanmar as it is now heading towards the right direction for its economy. That is why; this particular year, 2011, is used as a proxy variable. Tax on international trade is also another variable measuring the policy effectiveness. If the new economic policy of Myanmar has a positive impact on economy, In Tax will result in negative sign and  $Y_{11}$  will have a positive sign.

Other coefficients in the models; In Edu, In Lab., In Exp and In Inv are expected to be positive because labor (human capital) or trade is the key factor of economic growth as pointed out by endogenous growth theory and most of the empirical studies. In fact, most of the studies have pointed out the correlation in with the labour growth and economic growth. However, export and economic growth are not very significantly related as some researchers found out (Narayan and Smyth 2010). Another factor relating to this variable is foreign aid and which clearly have the positive effect on the economy where export factor does not clearly contribute.

## **4.5 Econometric Methodology**

Following the research method of Narayan 2010, this paper conducts an approach to cointegration within an Autoregressive Distributed Lag Framework (ARDL). With a conditional unrestricted equilibrium correction model (UECM), ARDL technique tests significance of lagged variables. The advantages of ADRL method are that the regression might be of I (1), I (0) purely or mutually cointegrated, however ARDL method can still be applied. It does not pre-test the variables for the order of integration so it doesn't involve the risk of uncertainty. Contrary to Engle–Granger method, UECM method implied by ADRL approach does not push the short run dynamics into the residual terms. This method can also work with small sample size while the Engle and Granger (1987) and Johansen methods of co-integration are not completely accountable with the small samples. Narayan (2010) empirically tested the growth hypothesis with small sample size employing ADRL approach. ADRL method needs to establish the long run relationship and carried out the two step procedure. First using the model (1) and (2), the estimation of short and long run parameters is carried out and the test for the existence of the long term relationship predicted by the theory follows. Hypothetically, theory predicts that there is a long run relationship among the variables among  $\ln GDP_t$ ,  $\ln Lab_t$ ,  $\ln Expt$ ,  $\ln Edu_t$ ,  $\ln Invt$  and  $\ln Tax_t$ . Then, by taking all the variables turn by turn as dependent variables, unrestricted error correction regressions are estimated for model 1. Likewise, model 2 is also tested and unrestricted error correction

regressions are estimated. For testing the existence of the long run relationships, F test, which indicates that which variable should be normalized, is employed.

The null hypothesis

( $H_0 : \lambda_1GDP = \lambda_2GDP = \lambda_3GDP = \lambda_4GDP = \lambda_5GDP = \lambda_6GDP = 0$ ) against the alternative ( $H_1 : \lambda_1GDP$  or  $\lambda_2GDP$  or  $\lambda_3GDP$  or  $\lambda_4GDP$  or  $\lambda_5GDP$  or  $\lambda_6GDP \neq 0$ ).

As Narayan and Smyth (2010) has pointed out, the F test which has nonstandard distribution depends on

- (1) Whether the variables are I(0) or I(1).
- (2) The number of regressors
- (3) Whether ADRL model includes a trend.

The independent variables of I(d) (where  $0 \leq d \leq 1$ ) ; by assuming for lower value of the regressors as I(0) and an upper value as purely I(1) regressors. Then F statistic is computed in the excel data analysis and if we find that F statistic is less than lower bound critical value, then the null hypothesis of no co-integration is not rejected. However, if F statistic turns out to be greater than upper bound critical value, and then the null hypothesis is rejected and concludes that there is the cointegration between two models and the relationship between the dummy variable and the other variables. I(0) is referred to as upper bound critical values and I(1) is as lower bound critical values. If F test results show outside the critical bounds, an assumption can be made about the cointegration without knowing the order of integration of the regressors .

## Chapter 5: Empirical Results

### 5.1 Overview

First, test the presence of long run relationships in model (1) and (2). As all the data are annual time series data, the maximum number of lags in the ARDL was assumed equal to 2. For the result of calculated F- statistics, it is shown in the table (6).

<b>Table 6. F-statistics for cointegration relationship</b>					
Critical value bounds of the F statistic					
Model	5% level		10% level		Calculated F Statistic
	I (0)	I (1)	I (0)	I (1)	
1	2.217	3.130	1.854	3.158	4.225 (k = 5)
2	2.476	3.439	2.141	3.987	3.389 (k = 6)
<i>Notes:</i> The critical value bounds are from Table F in Pesaran&Pesaran (1997, p. 484). k is the number of regressors.					

As reported above, the calculated F- statistics, in both models F (GDP) is higher than upper bond critical value. The calculated F-statistics are reported in Table 1. In model F (GDP) is found higher in model (1) at 5% level and model (2) at 10% level. These result implies that the null hypothesis of no cointegration is rejected and there is conintegration relation existing among all the variables  $\ln GDP_t$ ,  $\ln Lab_t$ ,  $\ln Expt_t$ ,  $\ln Edu_t$ ,  $\ln Inv_t$  and  $\ln Tax_t$ , and  $Y_{11}$ .

### 5.2 Error Correction Model

As for second step, after the establishment of long run cointegration relationship, errors are estimated for both models by error correction model. The empirical results are shown in the tables 2 and 3.

<b>Table 7.</b> Long-run results of Model (1), 1998-2017 $\ln GDP_t = \alpha_0 + \ln Lab_t + \ln Expt_t + \ln Edu_t + \ln Inv_t + \ln Tax_t$		
Variables (dependent variable is $\ln GDP$ )	Coefficients	t-Statistic
Constant	7.2954	0.7365
$\ln Lab_t$	10.0724*	3.8689
$\ln Expt_t$	0.5090*	2.3675
$\ln Edu_t$	-3.5033**	-1.6254
$\ln Inv_t$	1.0101**	1.6369
$\ln Tax_t$	0.0959***	0.2076

*Note :* (\*) indicates that the significant level at 5% and (\*\*) indicates that significance at the 20% and however (\*\*\*) indicates that P value is too high for the significant level even at 20% respectively.

**Table 8.** Long-run results of Model (2), 1998-2017  $\ln GDP_t = \beta_0 + \beta_1 \ln Lab_t + \beta_2 \ln Expt + \beta_3 \ln Edu_t + \beta_4 \ln Invt + \beta_5 \ln Tax_t + \beta_6 Y_{1t} + \epsilon_{2t}$

Variables (dependent variable is $\ln GDP$ )	Coefficients	t-Statistic
Constant	11.9572	1.2048
$\ln Lab_t$	10.7210*	3.8689
$\ln Expt$	0.4057 **	2.3675
$\ln Edu_t$	-4.3814 **	-1.6254
$\ln Invt$	0.9361 ***	1.6369
$\ln Tax_t$	0.1353 ****	0.2076
$\ln Y_{1t}$	0.112175***	1.540401

Note :(\*) indicates that the significant level at 5% and (\*\*) indicates that significance at the 10% and (\*\*\*) is significant at 20%. However (\*\*\*\*) indicates that P value is too high for the significant level even at 20% respectively.

For the short run, according to the error term  $EC_{t-1}$ , UECM is statistically significant at 1 percent for each of the models with a negative sign except two variables ( $\ln EDU$  and  $\ln TAX$ ), so it is confirming that a long run equilibrium relationship exists between the variables except Education and Tax. For error correction coefficients, model 1 is - 0.0754 and -0.0719 for the model 2. In the fit of the model, the residuals, autocorrelation test and function forms for each case, two variable of the model (Education and Tax) fails to fit in and others variables are mostly fitting in.

### 5.3 Interpretations of the Variables

The first variable, the labour force and real GDP has a strong relationship. In Lab have positive signs in both models. They are also significant at 5% in both models. The positive coefficient of the labour force can be assumed the relative significant of GDP, in another word, the labour force of Myanmar is the significant factor contributing GDP. This factor is realistic in Myanmar as Myanmar's GDP is still relying on the Agriculture, as its main component of GDP, trying to switch towards labour intensive industrialization which consumes a lot of labour.

For the second variable, the export, it is significant at 5% level in the first model and 10% level at the second model. In both models  $\ln EXP$  has positive signs that show the correlation with GDP. The results show that coefficients are statistically significant and the relationship with GDP is strong. It is consistent with the Myanmar's gas export revenue and other resource exports. However Myanmar's export sector is not contributing to the sustainable economic growth and has to be careful.

The third variable, human development or the human capital variable is the worst and have negative signs on both models. It is statistically insignificant at 5% level on both models unexpectedly. One might wonder why is it not contributing to the GDP but in the case of Myanmar education sector is lagging behind and it does not yet contribute much to the total factor productivity. In fact, it is consistent with the conditions of Myanmar which has labour intensive workforce rather than technology driven workforce. Myanmar definitely needs to build up human capital along with the modernization of the country.

Forth variable, the investment factor of GDP has a positive sign and showing the correlation. However, it is significant only at 20% at both models. So the weak result is pointing out that Myanmar's GDP is not yet largely contributed by Investment factor. It is , in fact, correct as Myanmar still is one of the lowest FDI receiving country in Asia and domestic investment is not mobilizing yet with a lot of barriers such as difficulties of assess to the loans.

The TAX variable is insignificant in both models although it does have a positive sign. Normally one would expect that when GDP is going up as projected to 2017, the revenue should also go up although they are not the correlated variable as components. Myanmar seriously needs the strong tax reform. TAX variable in both models is not significant which means that economic growth and total tax received still have the weak relationship.

The dummy variable, Y11, in the model (2), representing the year that has started the economic reform is only significant at 20% level. It does have a positive sign and pointing that policies are contributing to economic growth and they are correlated. However, the weak relationship of P value means that changes of Myanmar economic policies do not have the strong effects and momentum on the economy of Myanmar until 2017. It might also literally be interpreted as the direction of economic reform or the economic policies of Myanmar are not yet bringing out the potential gains.

## **5.4 Discussion of the Findings**

This paper has addressed the question of whether the economic policies of new government of Myanmar are heading towards sustainable growth. It employed the ARDL approach to cointegration to test the relationship of economic performance and the effect of new policies. Cobb–Douglas production function was the key model and framed to develop the effect of changes of economic policy and economic development. It appears that Myanmar's economy is going in the right direction when looking at the focus of the GDP that is showing some

growth since 2011 the time the new government commenced and all the recommendations from World Bank (2012) and IMF reports (2013). However, the findings of this paper show that it is not so.

This research shows that the labour force is the main contribution factor of GDP growth in Myanmar. So Myanmar should focus on the labour's capacity building such as investing in education and health care more. Second variable export is also one of the key contributors of growth as was expected. However, as shown in the figure (5), Myanmar's export is mainly contributed by gas, sesame seeds, gems, rice, teak, beans, pulses, fish and shrimps and not yet by any manufacturing or production that it cannot sustain the economic growth in the long run (ITC 2013). Education factor of Myanmar in the result marks a striking difference with expectations because it does not relate to the improvement of GDP. The standard of education in Myanmar was degraded by the malpractice and corruption for more than three decades and is lagging far behind its peers and neighbours (Soe 2008, 115).

Only when there is capacity building or investment in labour, the productivity of labour will improve. Tax variable and investment variables were found insignificant and not contributed much to GDP in Myanmar. The proxy for the economic reform date predicts that there is no significant change in economic growth because of the current policy changes.

On the whole the result of this research indicates that Myanmar's current economic policies are not enabling the country to realise the potential gains until 2017. This paper is apparently consistent with other growth policy test methodologies, however, we still need to realise why we have this result. Overall main focus of the policy should be the balanced growth of entire country. In another word, it should emphasise more on the agriculture and rural development other than focusing only on the central area development. Secondly, Myanmar's overall policy is still not favouring the production and manufacturing which need proper banking sector and adequate infrastructure. Since the new democratic government came up, Myanmar is overwhelmed by the policy suggestions from all over the world IMF, World Bank, Institutions, Major players and world famous researchers. In fact, the focus of the policy, implementations and its enforcement, evaluation, research and development and applications of the findings are what matter to improve the entire policy making process. The policy making may be however great, if the implementation is lagging behind because of the corruption and the bureaucratic system, Myanmar's economic policies will never realise its potential gains.

## **5.5 Limitations and credibility of the research**

All the time series data used in this study are from secondary sources and might be subject to biases and other measurement errors. The time period is limited to 1998 to 2017 because of the limited data availability. From 2013 to 2017 data are of IMF staff estimates. Due to lack of data and short time frame, variables such as openness to the trade, regulatory efficiency index that would have given much more accurate estimates of productivity were not possible employed in the test. Given the short time frame of 2011-2017, the impact of the policy change of new government may or may not yet be felt by the economy. Analysis of Myanmar's economy would be needed for further studies. However, several procedures were used to enhance credibility of the data and findings .First, transferability was strengthened by having three phases that make consensus decisions regarding categories. Second, dependability was augmented by writing memos in which decisions and conclusions were documented. Third, conformability was enhanced by documenting feelings and potential biases in reflexive journals for discussion.

## Chapter 6: Recommendation

Myanmar's new government is endeavouring hard to change the economic policies towards better reform. However, Myanmar's current economic reform seems to be focusing on every aspect of economy rather than trying to gain the surpluses transfer from agriculture to industrialization. Notwithstanding the changes of the policies by the top-down reform, there are barriers to economic development such as the old habits of the bureaucratic red tapes, lagging in the implementation, corruption, lacking the transparency and rule of law as well as checks and balances as soft policy measures. There are also soft and hard infrastructure needs in Myanmar's economy starting from electricity and water supply, transporting system, communication channels, proper banking system, creating access to the loans. Joseph Stiglitz (2012) also pointed out the importance of financial reform and creating a competitive business environment along with infrastructure. To carry out the proposed two polar economic improvement strategies, Myanmar still needs to balance the target the enhancement of institutional and physical infrastructure.

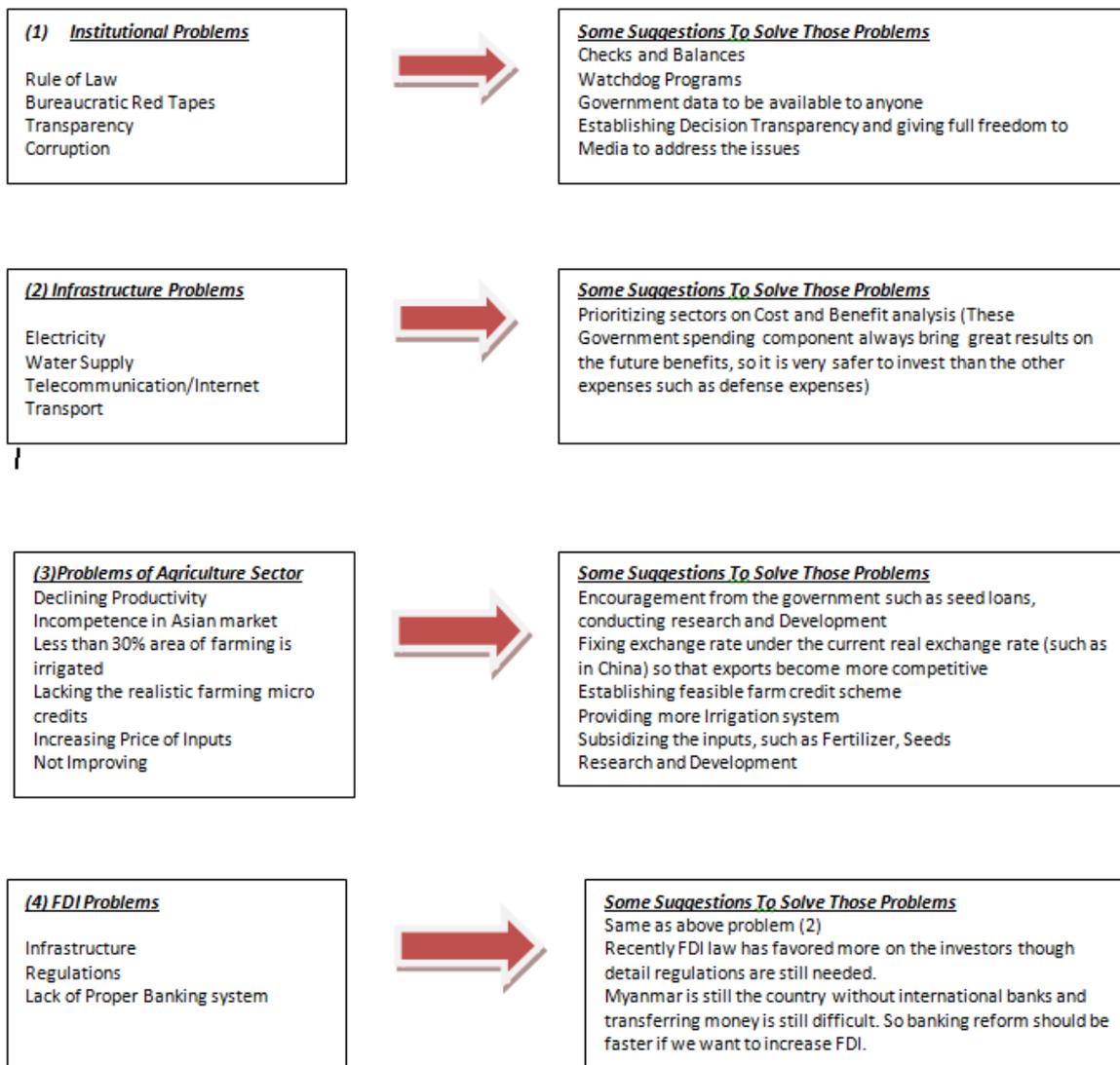
Myanmar will need to invest more in education for the coming generation to build up human capital which is one of the most important factors while its peers use more than 5% of the budget on education, it should also consider allocating more.

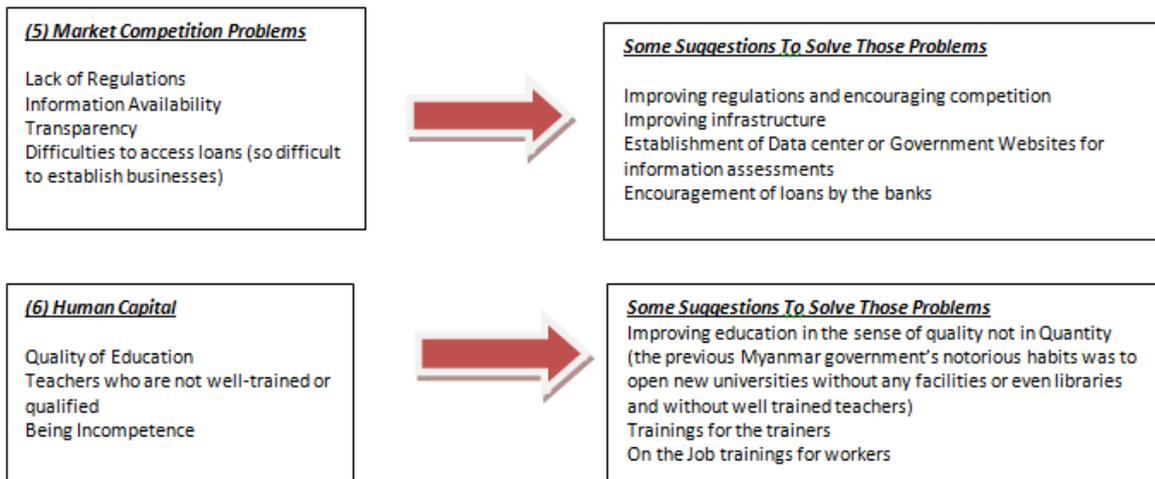
For the agricultural sector to become more productive and have surplus to transfer to the industrialization, farm credit program are needed along with the reliable and reasonably priced fertilizer and inputs. Agriculture sector should also be supported by an exchange rate supporting profitable production, proper irrigation systems, investments in water control and rural electrification, and most importantly with better research, development services. By looking at the success stories of China, Vietnam, and Thailand, Myanmar should have taken agriculture and price reform as a first step to reduce poverty instead of opening up everything from the top-down model. Following Southeast Asia economic development model, low-cost manufacturing and labour intensive industries can be the engine of economic take-off in Myanmar. However, the dominance of Chinese manufacturing in the region is undermining Myanmar's competitive advantage of labour that Myanmar should focus more on the Agriculture first.

Given the population's rising expectations, if results do not come quickly or if economic policies are difficult to execute, political shocks could result. In order to have sustainable

economic development manufacturing is the key to the transformation as was shown in the comparative analysis chapter (2), and there is now very little in Myanmar. First, it needs to have the openness to the trade and outward looking policy to the relative level of its peers. Secondly macroeconomic stability is a key to mobilize the market. Third, Myanmar needs to consider investing more on its people to create human capital. Fourth, social and physical infrastructure should be given priority to attract investments and reduce transaction costs. From the political economic point of view, Myanmar needs to adopt full transparency and accountability to fight corruption. Other than that, in the medium term strategy, important sectors such as agriculture, banking and industries that urgently require the attention for improvement should not be overlooked for its sustainable economic growth.

### **Summary of Recommendation**





## Conclusion

Myanmar is now taking its turn for the economic development after decades of stagnation and mismanagement, however with a legacy of economic repression cannot easily be eradicated. This paper in the chapter (2) examines the Myanmar's new government movements and economic policies. The top down economic policies that is adopted has a lot of positive effects on economy however; there are limitations such as not focusing on the development of rural area. The reform pattern is somehow stuck in the step of implementation with old habits of former government and bureaucratic red tapes. The history of Myanmar's macroeconomic conditions did not favour to flourish the economy on its own as the economy suffered from the extreme inflations in recent years until 2010. Myanmar's potential of FDI and economic growth can be realized when policies are correctly directed. The biggest gap and defect is the banking sector of Myanmar which is still lagging behind all the movements of policies and still manage by the central control. To stimulate the economy, the access to the loans must be available but in Myanmar, it is still a problem. Myanmar's export figures are picking and supporting the revenues of Myanmar government. However, the main exports of Myanmar are much more of eco-hazard type such as teak and hard woods as well as minerals, Gems and precious stones. Overall Myanmar's macroeconomic framework is still devoid of market mechanism and much more of centrally plan and needs mending.

Comparative study result shows that Myanmar's saving and investment is one of the lowest in the world. Most of the economic transition happened in Southeast Asia were based on the agricultural transformation but Myanmar's development pattern does not seem to focus on Agriculture as the productivity is not improving. Among the other sector, Myanmar's manufacturing and industrial sector is lagging behind and saw only 7% in 2001 and 0.2% in 2009 improvement. The top export earners are Petroleum, liquefied natural gas (LNG), and minerals such as gold, jade and gems, copper, tin and zinc. Some other industries include food and beverages, electronics, electrical products, steel processing, chemicals, garment, metal and machine products.

On the other hand, Myanmar's governance structure is still considered a failure by its citizens as most police and Judges in Myanmar are corrupted and too close to the cronies and officials. The law enforcement bodies are generally viewed as unfriendly and the judicial process as costly and daunting. The pattern of development suggests that Myanmar is at the stage of beginning phase of industrialization which needs to gain surpluses from agriculture as well as from intra-regional trade and labour intensive industries such as textile, pulps, beans, rice, and rubber and so on.

Growth models, such as Harrod-Domar, Solow model, new growth theory, Cobb-Douglas production function, have been formulated from different perspective and have different variables: however they address the importance of saving and capitals, human capital, openness to the trade, macroeconomic stability, political stability, technological change and most importantly the surpluses transfer from agriculture to industrialization as key drivers to economic growth.

Employing the frame work initiated by Narayan 2010, using Cobb-Douglas function as a base theory and the cointegration within an Autoregressive Distributed Lag Framework (ARDL), this paper tested whether the economic reform of Myanmar is heading towards the right direction. The empirical results show that Myanmar economic policies are still lacking the accountability and the economic policies of Myanmar are not yet realizing the potential gains.

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# Appendix

## Error Correction Models

$$\begin{aligned}\Delta \ln GDP_t &= a_{0GDP} + \sum_{i=1}^n b_{iGDP} \Delta \ln GDP_{t-i} + \sum_{i=0}^n c_{iGDP} \Delta \ln Lab_{t-i} \\ &+ \sum_{i=0}^n d_{iGDP} \Delta \ln Exp_{t-i} + \sum_{i=0}^n e_{iGDP} \Delta \ln Edu_{t-i} + \sum_{i=0}^n f_{iGDP} \Delta \ln Inv_{t-i} \\ &+ \sum_{i=0}^n \Delta_{iGDP} \Delta \ln Tax_{t-i} + \lambda_{1GDP} \ln GDP_{t-i} + \lambda_{2GDP} \ln Lab_{t-i} \\ &+ \lambda_{3GDP} \ln Exp_{t-i} + \lambda_{4GDP} \ln Edu_{t-i} + \lambda_{5GDP} \ln Inv_{t-i} \\ &+ \lambda_{6GDP} \ln Tax_{t-i} + \varepsilon_{1t}\end{aligned}\tag{A1}$$

$$\begin{aligned}\Delta \ln Lab_t &= a_{0Lab} + \sum_{i=1}^n b_{iLab} \Delta \ln Lab_{t-i} + \sum_{i=0}^n c_{iLab} \Delta GDP_{t-i} \\ &+ \sum_{i=0}^n d_{iLab} \Delta \ln Exp_{t-i} + \sum_{i=0}^n e_{iLab} \Delta \ln Edu_{t-i} + \sum_{i=0}^n f_{iLab} \Delta \ln Inv_{t-i} \\ &+ \sum_{i=0}^n g_{iLab} \Delta \ln Tax_{t-i} + \lambda_{1Lab} \ln GDP_{t-i} + \lambda_{2Lab} \ln Lab_{t-i} \\ &+ \lambda_{3Lab} \ln Exp_{t-i} + \lambda_{4Lab} \ln Edu_{t-i} + \lambda_{5Lab} \ln Inv_{t-i} \\ &+ \lambda_{6Lab} \ln Tax_{t-i} + \varepsilon_{2t}\end{aligned}\tag{A2}$$

$$\begin{aligned}\Delta \ln Exp_t &= a_{0Exp} + \sum_{i=1}^n b_{iExp} \Delta \ln Exp_{t-i} + \sum_{i=0}^n c_{iExp} \Delta \ln Lab_{t-i} \\ &+ \sum_{i=0}^n d_{iExp} \Delta \ln GDP_{t-i} + \sum_{i=0}^n e_{iExp} \Delta \ln Edu_{t-i} + \sum_{i=0}^n f_{iExp} \Delta \ln Inv_{t-i} \\ &+ \sum_{i=0}^n g_{iExp} \Delta \ln Tax_{t-i} + \lambda_{1Exp} \ln GDP_{t-i} + \lambda_{2Exp} \ln Lab_{t-i} \\ &+ \lambda_{3Exp} \ln Exp_{t-i} + \lambda_{4Exp} \ln Edu_{t-i} + \lambda_{5Exp} \ln Inv_{t-i} \\ &+ \lambda_{6Exp} \ln Tax_{t-i} + \varepsilon_{3t}\end{aligned}\tag{A3}$$

$$\begin{aligned}
\Delta \ln Edu_t &= a_{0Edu} + \sum_{i=1}^n b_{iEdu} \Delta \ln Edu_{t-i} + \sum_{i=0}^n c_{iEdu} \Delta \ln Lab_{t-i} \\
&+ \sum_{i=0}^n d_{iEdu} \Delta \ln GDP_{t-i} + \sum_{i=0}^n e_{iEdu} \Delta \ln Exp_{t-i} + \sum_{i=0}^n f_{iEdu} \Delta \ln Inv_{t-i} \\
&+ \sum_{i=0}^n g_{iEdu} \Delta \ln Tax_{t-i} + \lambda_{1Edu} \ln GDP_{t-i} + \lambda_{2Edu} \ln Lab_{t-i} \\
&+ \lambda_{3Edu} \ln Exp_{t-i} + \lambda_{4Edu} \ln Edu_{t-i} + \lambda_{5Edu} \ln Inv_{t-i} \\
&+ \lambda_{6Edu} \ln Tax_{t-i} + \varepsilon_{4t}
\end{aligned} \tag{A4}$$

$$\begin{aligned}
\Delta \ln Inv_t &= a_{0Inv} + \sum_{i=1}^n b_{iInv} \Delta \ln Inv_{t-i} + \sum_{i=0}^n c_{iInv} \Delta \ln Lab_{t-i} \\
&+ \sum_{i=0}^n d_{iInv} \Delta \ln GDP_{t-i} + \sum_{i=0}^n e_{iInv} \Delta \ln Exp_{t-i} + \sum_{i=0}^n f_{iInv} \Delta \ln Edu_{t-i} \\
&+ \sum_{i=0}^n g_{iInv} \Delta \ln Tax_{t-i} + \lambda_{1Inv} \ln GDP_{t-i} + \lambda_{2Inv} \ln Lab_{t-i} \\
&+ \lambda_{3Inv} \ln Exp_{t-i} + \lambda_{4Inv} \ln Edu_{t-i} + \lambda_{5Inv} \ln Inv_{t-i} \\
&+ \lambda_{6Inv} \ln Tax_{t-i} + \varepsilon_{5t}
\end{aligned} \tag{A5}$$

$$\begin{aligned}
\Delta \ln Tax_t &= a_{0Tax} + \sum_{i=1}^n b_{iTax} \Delta \ln Tax_{t-i} + \sum_{i=0}^n c_{iTax} \Delta \ln Lab_{t-i} \\
&+ \sum_{i=0}^n d_{iTax} \Delta \ln GDP_{t-i} + \sum_{i=0}^n e_{iTax} \Delta \ln Exp_{t-i} + \sum_{i=0}^n f_{iTax} \Delta \ln Edu_{t-i} \\
&+ \sum_{i=0}^n g_{iTax} \Delta \ln Inv_{t-i} + \lambda_{1Tax} \ln GDP_{t-i} + \lambda_{2Tax} \ln Lab_{t-i} \\
&+ \lambda_{3Tax} \ln Exp_{t-i} + \lambda_{4Tax} \ln Edu_{t-i} + \lambda_{5Tax} \ln Inv_{t-i} \\
&+ \lambda_{6Tax} \ln Tax_{t-i} + \varepsilon_{6t}
\end{aligned} \tag{A6}$$