RELATIONSHIP BETWEEN INFLATION AND BUDGET DEFICIT IN MYANMAR (1986 – 2016)

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Abstract

Many scholars believe that budget deficit is the main cause of inflation. This paper attempts to investigate the relationship between inflation and budget deficit in Myanmar from 1986 to 2016.This study applied time series data from CSO and World Bank. In the empirical analysis, *ADF unit-root test*, *co-integration test* and *Granger-causality test* are applied. According to the co-integration test, there was long run negative co-integration between inflation and budget deficit in Myanmar. The Granger Causality test's results show that budget deficit causes inflation in Myanmar.

1. Introduction

The relationship between the inflation and budget deficit from 1986 to 2016, is necessary to study for Myanmar development while the country is facing both budget deficit and inflation problems in long-term.

Alan Greenspan (2007) cited Professor Burns that "Excess government spending cause's inflation". Inflation is one of the important issues for a developing country to apply its monetary tools. Inflation can impact on the people by the rising of the price of services and products. And the budget deficit is the long term relationship with inflation in Myanmar. Indeed, in Myanmar the budget deficit has a root cause of inflation (Thein, 2009).

Comparing with ASEAN countries, Myanmar got highest inflation rate and long run budget deficit. According to Olivera-Tanzi Effect, budget deficit can cause inflation and vice versa, inflation can cause on budget deficit. This paper aims to examine the relationship between inflation and budget deficit.

Macroeconomic stabilization can support economic development. To control the inflation rate, Central Bank plays as a big role not only for low and steady stage on inflation but also for economic development. Professor Rajan (2018) suggested that as the central bank of a developing country, we have additional tools to generate growth – we can accelerate financial development and inclusion. The best way for the central bank to generate growth in the long run is for it to keep inflation low and steady. The above statement is a concept that attempts to be lower inflation rate encourage directly and indirectly to economic development.

1.1 Comparison of Inflation Rates between ASEAN Countries within 1986 to 2016

The Asian Financial Crisis occurred on 2 July 1997 when the Thailand government burdened with a huge foreign debt decided to float its Baht after currency speculators had been attacking the country's foreign exchange reserves. This monetary shift was aimed at stimulating export revenues but proved to be in vain. It soon led to a contagion effect in other Asian countries as foreign investors who had been pouring money into the "Asian Economic

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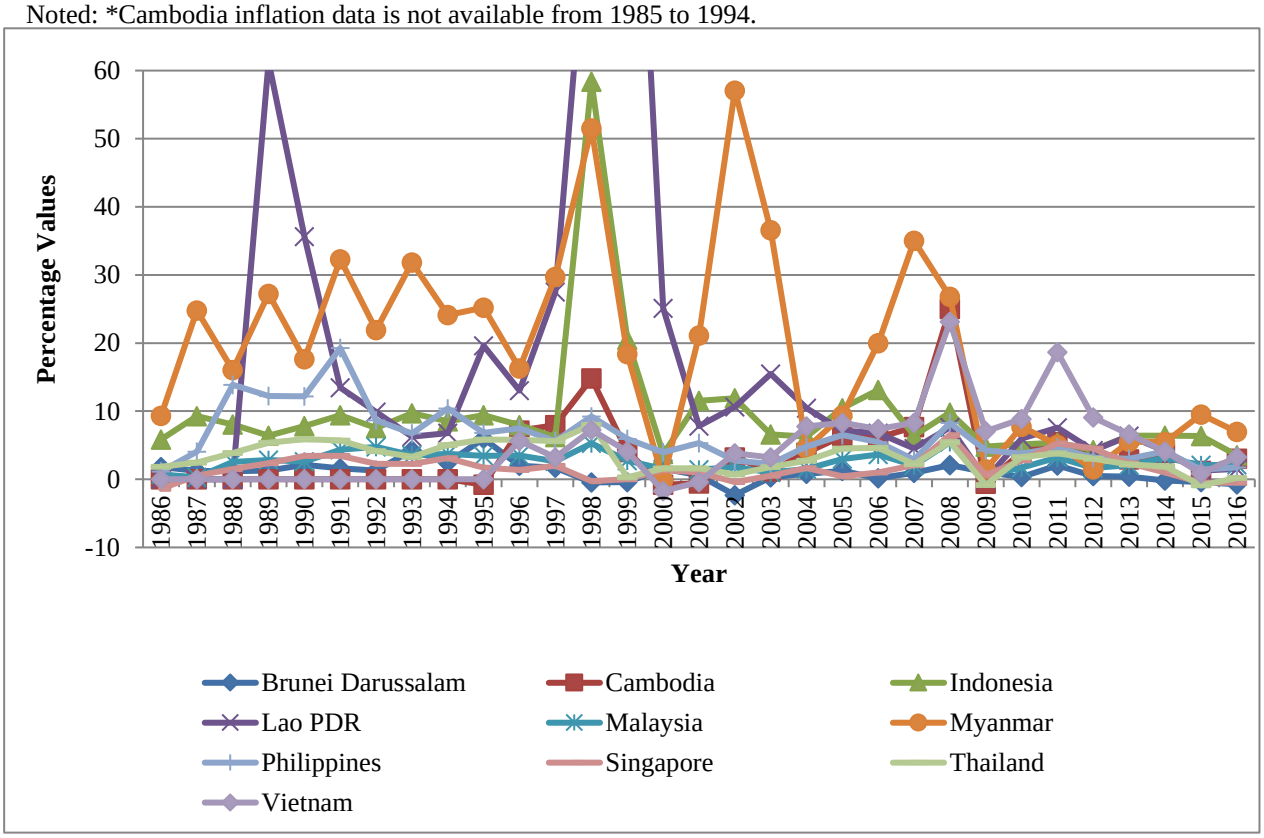
Miracle countries" since a decade prior to 1997 – lost confidence in Asian markets and dumped Asian currencies and assets as quickly as possible.

As show in figure (1), the period of 1997s, most of the ASEAN countries had high inflation because of the Asian Financial Crisis. Among them, Lao PDR had the highest inflation rate with 125% in 1999, Indonesia had 98%in 1998 and Myanmar had 51% in 1998. Other ASEAN countries each also faced their countries' highest rate in this period.

Zamorski, M. J., & Lee, M. (2015) suggested that one of the triggers for the Global Financial Crisis was the sudden cessation of interbank lending among large global banks. The requirements are that central banks, regulators and governmental officials need to act very quickly even if the situation is short of complete information. Some interventions proved to be quite controversial due to the moral hazard they posed and, in some cases, taxpayers' funds were put at substantial risk.

Figure (1) Comparison of Inflation (Consumer Prices) within ASEAN Countries, from 1986 to 2016(Annual %)

Noted: *Cambodia inflation data is not available from 1985 to 1994.



**Lao PDR inflation data is not available from1985 to 1988.

***Vietnam inflation data is not available from 1985 to 1995.

Source: World Bank Dataset (Various Countries)

The global financial crisis began in 2007 with a crisis in the subprime mortgage market in the United States. During the 2007 global financial crisis, Myanmar, Cambodia and Lao PDR had the highest inflation rate among ASEAN countries.

According to the table (1), Myanmar still has highest inflation rate of 9.5percent among ASEAN countries and Indonesia has the second highest inflation rate of 6.4percent in 2015. Cambodia, Lao, Malaysia and Philippines are second lowest group of inflation rates with an

average 1.5 percent in 2015. Brunei Darussalam, Singapore, Thailand and Vietnam countries are lowest in inflation rate, among ASEAN countries in 2015.

Table (1) Inflation, Consumer Prices (Annual %Change) in ASEAN Countries 2015 and 2016

Year	Brunei Darussalam	Cam-bodia	Indo-nesia	Lao PDR	Malaysia	Myanmar	Philip-pines	Singa pore	Thai-land	Vietnam
2015	-0.4	1.2	6.4	1.3	2.1	9.5	1.4	-0.5	-0.9	0.9
2016	-0.7	3.0	3.5	1.5	2.1	7.0	1.8	-0.5	0.2	3.2

Source: World Bank (2017)

Myanmar experienced the highest inflation rate (7 percent) in ASEAN in 2016. Cambodia, Indonesia and Vietnam followed with the second highest inflation rate with average 3.2 percent. At the time Lao, Malaysia and Philippines faced second lowest inflation rate in ASEAN in average 1.8 percent at 2016. And Brunei Darussalam, Singapore and Thailand had lowest inflation rate group in ASEAN in 2016.

1.1 An Overview on Relationship of Inflation and Budget Deficit in Myanmar

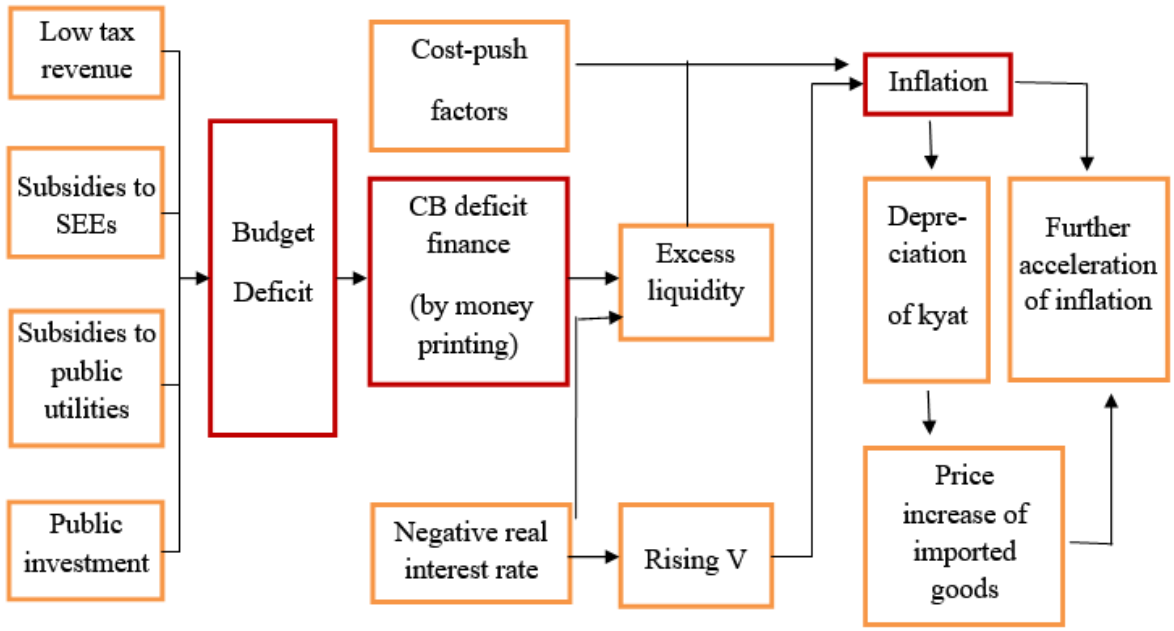
1.1.1 Periods of Political System and Economic System (1986 to 2016)

The political system in Myanmar during the period of 1974 – 1988 was depicted as the Burmese way to socialism under military rule with one party system (Burma Socialist Programme Party) and the economic system of Command economy, Self-reliance and isolation. (Myat Thein, 2001). After taking power in September 1988, the State Law and Order Restoration Council adopted new economic policies that moved Myanmar away from its traditional closed economy. Following the years 1974 to 1988, the political system of Myanmar in the period of 1988-2010 was driven by the military regime called the State Law and Order Restoration Council (SLORC)/State Peace and Development Council (SPDC) and the economic system was based on transition market – oriented economy. During the military regime, the Constitution of the Republic of the Union of Myanmar was formulated on 3rd September, 2007 and this came into force on 29th May, 2008. Under the 2008 constitution the political system of the state is based on multi-party democracy and its economic system is based on market economy. As the Union Solidarity and Development Party(USDP) won the general election held in 2010, a former top-general U Thein Sein became the president of the state until 2015. After his presidency, U Htin Kyaw from the National League for Democracy (NLD) took the office with a landslide victory in the 2015 multi-party general election.

1.1.2 The Inflationary Mechanism in Myanmar

According to the figure 2, budget deficit is mainly caused by four kinds of factors in Myanmar, (i) Low tax revenue, (ii) Subsidies to State Economic Enterprises (State Owned Enterprises), (iii) Subsidies to public utilities and (iv) Public investment.

Figure (2) The Inflationary Mechanism in Myanmar



Source: Myat Thein (2009), Money Matters Essays on Money and Banking
Note: CB = Central Bank, V = Velocity

(i) Low tax revenues

Myanmar has the lowest tax revenues in ASEAN countries. Low tax revenues can be the cause of budget deficit that lead to increase in inflation rate because government has to borrow money from Central Bank of Myanmar to expend. The Budget department in Myanmar practices the policy of maximizing the tax rate in order to minimize inflation if the budget deficit occurs. On the other hand, that policy directly increases the commodities prices in the market.

(ii) Subsidies to State Economic Enterprises (SEEs)

State Economic Enterprises (SEEs) is an additional cost in government expenditure. There is no need to transfer all SEEs to the private sector. Some SEEs are profitable and some are not. The government has to implement the maximizing of economics of scale for the state's vital manufacturing products.

(iii) Subsidies to Public Utilities

Public utilities are services provided to the people by the government, such as supply of electricity, and road. These costs of government expenditure are a kind of burden for budget deficit. On the other hand, the government has responsibility to provide vital public service.

(iv) Public Investment

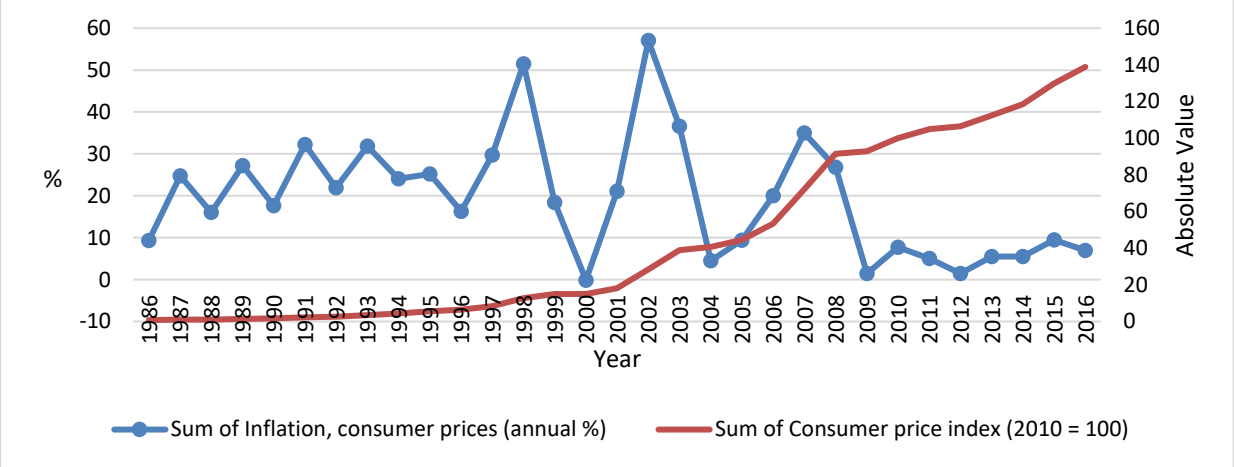
Public Investment is the money that government spends on public services and goods such as education and health for the long run. As Myanmar is a developing country, it must

invest in such services. Which however may not have direct impacts in the short run. Thus this depends on the government policy.

1.1.3 Inflation Rate in Myanmar 1986 to 2016

Burma Socialist Programme Party government announced the demonetization of K45 and K90 at 1987[1] to cut inflation and black money in the market. According to the figure 3, the inflation rate from 1987 to 1995 averaged around 25 percent per year. The average inflation rate from 1994 to 2002 was 30.5 percent, mainly due to the monetization of the fiscal deficit. (Fumiharu Mieno, 2009). Between the period of 1996 to 1998, inflation rate increased 25 percent because of Asian Financial Crisis and dropped nearly 50 percent from 1998 to 2000. While the worsening fiscal conditions included chronic inflation through the monetization of the fiscal deficit, the mechanism was temporarily, in the late 1990s, when the emerging private banking sector started to absorb the treasury bonds in 1993. After 2001, inflation surged, the real exchange depreciated. The local asset markets appeared prosperous until 2002, but fell subject to panic during the banking crisis of February 2003[2]; the pausing of multiplier effect of banks and informal financial enterprises caused rapidly falling inflation in 2003 bank crisis. The period of 2004 to 2007 is recovery stage of the Myanmar economy but during 2008 the Global Financial Crisis, inflation decreased dramatically, average 30percent. Therefore, in the last part of 2009, inflation rate became both stable and low. The inflation rate in Myanmar, during the period of 2010s, is also both stable and low.

Figure (3) Inflation (consumer price, annual %) and Consumer Prices Index in Myanmar 1986 to 2016



Source: World Bank (2017)

[1] Many regarded the demonetization of 1964, 1985, and 1987 as having destroyed the "banking habits" of Myanmar households and arrested the development of banking in Myanmar (Myat Thein, 2001).

[2] The bank run was started by a rumour about a scandal in the largest private commercial bank the Asia Wealth Bank (*Asia Dana*), at the beginning of February 2003, and as early as 6 February, long queues for the withdrawal of deposits at AWB branches were reported. The rumour was preceded by the bankruptcy of several informal financial so-called "general service companies (GSCs)". The banks requested liquidity support from the Central Bank at the outset of the bank run. It was not until 21 February that the Central Bank announced private commercial banks, including AWB. However, this liquidity assistance amounted to less than 10 percent of the deposits of the AWB alone (250 billion kyats as the end of 2002). *(Koji Kubo, Ryu Fukui and FumiharuMieno, 2009)*

In the panic a flight to cash led to a rapidly and appropriately supplied by the Central Bank of Myanmar could have limited the contagion. Such liquidity support from the CBM, however, was too little and too late. Worse, the CBM's orders endorsing restrictions on withdrawals and the recalling of loans from borrowers greatly impaired trust – the indispensable ingredient of financial stability. *(Sean Turnell, 2009).*

[2] The contraction of the economy continued in 2004, but entered a recovery phase in 2005 (F. Mieno, 2009).

According to figure (3), Consumer Price Index (CPI) was stable in Myanmar and the period 1986 to1990s. But after the Asian Financial Crisis (1997) CPI started tremendously increasing till 1998 and significantly fell again till 2000. The 2000s showed instability because of bank crisis faced in Myanmar in 2003. The period of 2008 Global Financial Crisis, CPI rate was in the stage of slumpflation. During the fiscal year (FY) 2012-2013, CBM explained that the inflation rate had gradually climbed up, because of the price rise for imported items such as fuel, medicine etc. And during the FY 2013-2014, CBM summarized the average annual rate of inflation as having increased 5.72 percent due to exchange rate depreciation pressure, increase in electricity tariff and real estate price together with global oil price increase. CBM analyzed that the increasing 0.18 percent annual rate of inflation FY 2014-2015 that moderate due to the exchange rate depreciation, property price increased and increased in electricity charges.

The Governor of the CBM stated that the slowdown of economic growth in the first half of 2016 was mainly caused by the heavy flood in Mid-2015 which destroyed agricultural output and was depressed investment in oil and gas sector. Inflation had reached double digit in November 2015 caused by money supply growth resulting from Central Bank of Myanmar's purchase of government securities and the increase in food and rental prices (Kyaw Kyaw Maung, 2017).

With CPI increasing tremendously year by year, the question is why the inflation rate is fall. The possible answer is that price of food items, which account for 59 percent of the new CPI basket but non-food component of CPI items' price and services price are averagely stable. IMF (2016) also explained that the higher inflation rates appear to have mainly resulted from rising food prices, which represented more than two-thirds of the CPI basket. That is one of the reason, prices of foods in the market are high but low rate in the data. Therefore, it is case of problems in CPI calculation method and assumption of CPI basket items.

In fact, Myanmar may be facing both the Demand Pull Inflation and Cost Push Inflation occurs at the same time and other factors.

1.1.4 Budget Deficit in Myanmar 1986 to 2016

According to National Planning, Budget means what government has to expend to implement projects; how much revenue will be collected and how to expend (manage) the collected revenue in the upcoming fiscal year, through listing the finances.[3]

In Myanmar, the fiscal year includes twelve months starting from April 1stto March 31st. But U Htin Kyaw government changed the period budget year (April 1st to March 31st) to start October 1 and end September 30 so that construction of key infrastructure projects will not be hampered by the onset of the rainy season. The proposal to change the budget year was approved during a cabinet meeting on September 7, 2017.

In Myanmar, the State Budget is divided into six particulars with four main segments of Current Account, Capital Account, Financial Account and Receipts. All of these segments are divided into receipts and expenditures. The six main particulars are as follows;

(i) State Administrative Organizations (SAOs)
(ii) State Economic Enterprises (SEEs)

[3] This is translated from official Burmese version.

(iii) Development Committees (DCs)
(iv) Nay Pyi Taw Council
(v) Nay Pyi Taw Development Committee and
(vi) Social Security of Union Ministry and Department (Undertaken Outside the Union Fund).

Central Statistical Organization added new accounts of Nay Pyi Taw Council, Nay Pyi Taw Development Committee and Social Security of Union Ministry and Department (Undertaken Outside the Union Fund) in the State Budget in 2013 – 2014.

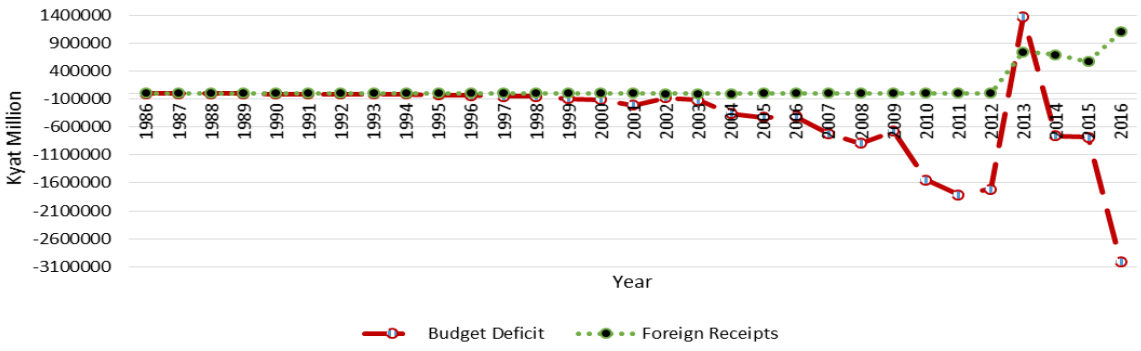
U Myat Thein (2009) pointed out that many scholars believe budget deficits to be root cause of inflation in developing countries. Myanmar faced long term budget deficit problem for many years. Fischer and Easterly (1990) has this to say. "Militon Friedman's famous statement that inflation is always and everywhere a monetary phenomenon is correct. However, governments does not print money at a rapid rate out of a clear blue sky. They generally print money to cover their budget deficit. Rapid money growth is conceivable without an underlying fiscal imbalance, but is unlikely. Thus rapid inflation is almost always a fiscal phenomenon.

The World Bank (1988) explained that "Excessive reliance on money creation is particularly risky if inflation worsens the deficits because expenditures keep pace with rising prices while revenues do not". This means that the more money creation becomes necessary the further the worsening of the inflationary spiral.

Professor Jeffrey Sachs (1997) pointed out with two examples on this issue, quasi-fiscal deficits are (1) extra-budgetary funds for social and regional spending, and (2) loans by the central bank and other state banks to state owned enterprises. Thus, the money supply may grow excessively as a result of three main factors: budget deficits, extra-budgetary expenditures and loans from the state banking system.

In Myanmar, these three kinds of factor effect growth of money supply. Between the years 1986 to 2016, most of the years experienced budget deficit. Government has to expend according to the country's situation, borrowing from the Central Bank which then has to print money. Looking at the following figure 3.4, Myanmar is seen to have budget deficit between the years 1986 and 2016, excepting the year of 2012-2013 had budget surpluses due to the high degree of international interests in democratic transition period. On that period of 2012-2013, Myanmar received a lot of foreign receipts as shown in figure (4).

Figure (4) Budget Deficit and Foreign Receipts in Myanmar 1986 to 2016 (Kyat Million)



Note: Foreign receipts includes foreign loans, foreign grants and foreign aids
Source: Statistical Year Book (Various Issues)

Compared to USDP government, the NLD government received foreign receipts more than USDP government did after it had taken the office officially on March, 2016. The main point is that NLD government faced high budget deficit in 2016. But budget deficit of the year 2015 (-782129.4) Kyats Million increased one digit number (284% Change) in 2016 to (-3005043) Kyat Million. That is marked as the highest budget deficit point in Myanmar during the years of 1986-2016.

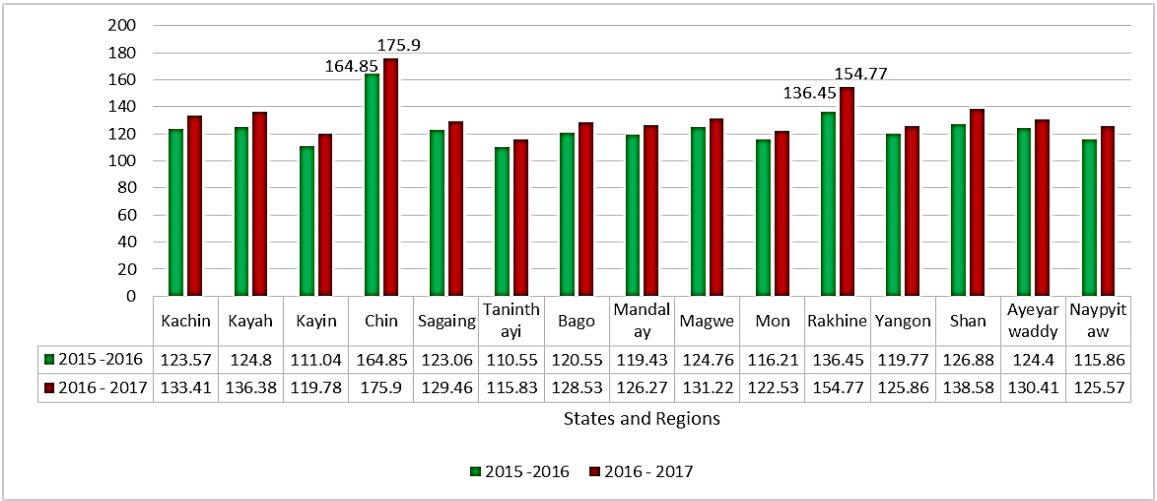
1.1.5 Political Pressure on Inflation in Myanmar (1986 – 2016)

Myanmar adopted the "Burmese Way to Socialism" from 1960 to 1988. In the period 1989 -90, the rice price rose because of the liberalization of domestic rice market resulting in dynamic inflation (Fujita and Okamoto 2006).

The 1987 demonetization was indeed the catalyst for the political upheaval of 1988. In 1988, the uprisings and strikes took place because of the stagnation of the economy during Burma Socialist Programme Party era and the absence of significant economic development in Myanmar (Myat Thein, 2001, p.121). Some scholars see "a clear correlation between economic growth, money and political unrest" (Collignon 2001, p.88). After the demonstrations, the military took power and the situation of economy became one of slow down. At that time, the amount of budget deficit increased because of the mostly long-term borrowing of money from other countries. Therefore, the military government tend to control to for economic stability by printing money process.

When the State Law and Order Restoration Council (SLORC) took over the reins of government, the country was for all practical purposes almost bankrupt. U Myat Thein(2001) pointed out that they did a great job in that endeavor although some of the measures might have done irreparable damage such as the institution authorized to issue notes and currency was put under the control of the army may be regarded as an ill-advised decision that perhaps has done irreparable damage to Myanmar. Those effects caused decreasing amount of GDP growth and the government faced with the budget deficit. The long term high inflation and fiscal deficit because of monetization of fiscal deficit had been root problem in Myanmar.

Figure (5) Comparison of Consumer Price Index of States and Regions from 2015-2016 to 2016 – 2017



	Kachin	Kayah	Kayin	Chin	Sagaing	Taninthayi	Bago	Mandalay	Magwe	Mon	Rakhine	Yangon	Shan	Ayeyarwaddy	Naypyitaw
2015 -2016	123.57	124.8	111.04	164.85	123.06	110.55	120.55	119.43	124.76	116.21	136.45	119.77	126.88	124.4	115.86
2016 - 2017	133.41	136.38	119.78	175.9	129.46	115.83	128.53	126.27	131.22	122.53	154.77	125.86	138.58	130.41	125.57

Note: CPI Base year 2012 = 100

Source: Statistical Year Book (2016)

According to the figure (5), Rakhine state became the second highest inflation state during 2015 -2016; the highest inflation state in the Chin State in 2015 -2016 with infrastructure and development at the lowest level among the States and Regions. Rakhine State again followed with the second highest inflation rate among others areas during the 2016 – 2017 year with immigration crisis and political pressure which eventually affected the inflation rate. Travelling cost and consumption cost in Rakhine state is also significantly higher than in any other States and Regions.

On the political front, transparency is an indispensable attribute of central banks accountability (Ortiz, 2009), especially where central banks are independent and monetary policy implementation is not subject to democratic scrutiny by the legislature. Correcting this "democratic deficit" is important for securing public support for policy actions which may entail short-run costs for longer-run gain (Minegishi & Cournède, 2009). The Deputy Governor of the CBM presented that the Central Bank's independency is the degree of freedom given to the Central Bank on the monetary policy without political interference. Independence from the fiscal authority is particularly important as a protection against monetization of debt. Political control can lead to higher inflation. Politicians often have a short-term perspective driven by the need to impress voters before the next election. This may mean sacrificing a stable price level to achieve immediate improvements in unemployment, growth or house mortgage rates. The populace, also often short-sighted sees the immediate improvement not knowing the long terms impacts. It is only a year or so later that people suffer the effects of economic stability. Politically insulated Central Bank is more likely to take decisions which are beneficial over the long term even if they cause a little pain now. (Soe Thein, 2018)

Actually, under the Central Bank of Myanmar Law (2013)[4], CBM can provide loans as follows:

The Central Bank may provide loans and advances to the Union Government with the approval of Pyidaungsu Hluttaw. Such provision of loans and advances shall be in accordance with the following conditions:

(a) The terms and conditions for loan and advance shall be prescribed from time to time by consultation between the Ministry and Central Bank;

(b) Such loans and advances shall be guaranteed by interest-bearing negotiable instruments of government securities with a maximum term of 92 days delivered by the Ministry to the Central Bank (section 91)

According to the CBM law (2013), the Union Government needs Union Budget Bill proposal approval by the Union Parliament (Pyidaungsu Hluttaw). On the other hand, the determinations of submission process of the Union Budget Bill by the Constitution of the Republic of the Union of Myanmar (2008) is following objectives:-

(a) The President or the person assigned by him, on behalf of the Union Government, shall submit the Union Budget Bill to the Pyidaungsu Hluttaw.

(b) The following matters included in the Union Budget Bill shall be discussed at the Pyidaungsu Hluttaw but not refused or curtailed:

[4] The English language of the Central Bank of Myanmar Law (2013) uploaded at CBM website and that is unofficial translation version.

(i) Salary and allowance of Heads and Members of the Union level organizations formed under the Constitution and expenditures of those organizations;
(ii) Debts for which the Union is liable and expenses relating to the debts, and other expenses relating to the loans taken out by the Union;
(iii) Expenditures required to satisfy judgment, order, decree of any Court or Tribunal;
(iv) Other expenditures which are to be charged by any existing law or any international treaty (section 103)[5].

According the law (section 103), union government can pass the submitting process of the Union Budget Bill without Pyidaungsu Hluttaw approval. Thus, even in the Central Bank of Myanmar Law (2013) giving more power to Central Bank of Myanmar than 1990 CBM Law, the union government still has power to get loans from CBM through Union Parliament because of the 2008 Constitution.

1.1.6 Effect of Hidden Factors on Inflation

Besides the fact that increase in budget deficit and money supply causes inflation, the expansions in the import cost and currency exchange rate are additional factors that lead to inflation for a country in which the economy mainly depends on imports. Furthermore, the issues on inflation may be very complex and it is difficult to give 100 percent reliable answer of which factors are the root causes of inflation. At the same time, printing money to solve the problems in huge budget deficit causes the informal inflation which also causes the Demand Pull Inflation, buying goods and services by using big amount of money. Apart from that, Cost Push Inflation can occur due to the unnecessary costs called indirect costs in Myanmar.

On the other hand, in legislating minimum wage in Myanmar, the government passes the legislation only for private sector but not for government sector because enterprises in Myanmar control of speculative motive while increasing wage for government (public) servants.

The impact of nature disasters such as Cyclone Nargis in 2008 and Komen 2015 are significantly increase the inflationary pressure.

1.1.7 Role of Treasury Bills, Treasury Bonds, and these Relation to Inflation in Myanmar

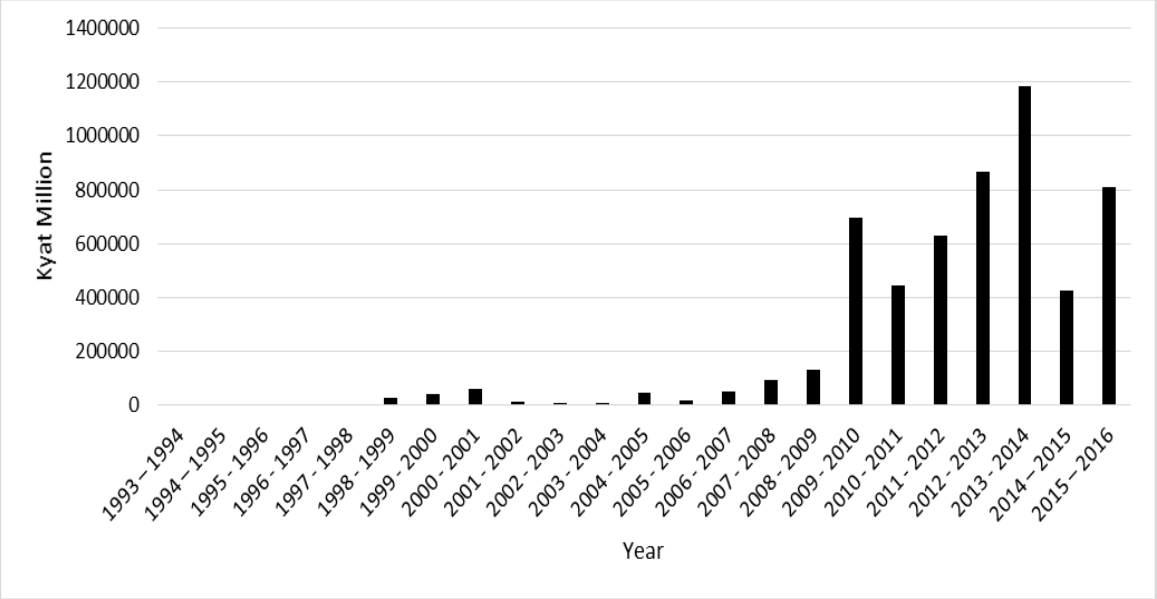
In order to invest for the public, Myanmar started selling Treasury Bonds since 1993. In 2012, it has also started selling the two-year treasury bonds. The role of treasury bonds is to solve the government's deficit by utilizing public's money through the method of selling the bonds. According to the following figures, there is increased selling and buying ponds since 2009.

To stabilize the inflation rate, CBM tries to put the total reserve money and the separate reserve money into their target-amount framework. The inflation rate in Myanmar averaged 9.99 percent in 2015-2016 financial year, 6.81 percent in 2016-2017 financial year, and dropped to 4.61 percent on December 2017. The Governor of the CBM stated that one of the

[5] Constitution of the Republic of the Union of Myanmar (2008), Chapter IV, Legislature, The Pyidaungsu Hluttaw, Submission of the Union Budget Bill, section 103.

main reasons for inflation is that CBM has to print more money to fill in the government spending. To reduce that, CBM and the Ministry of Planning and Finance have cooperated to hold monthly auctions for treasury bills and treasury bonds to private and state-owned banks. (Kyaw Kyaw Maung, 2018)

Figure (6) Government Treasury Bonds 1993 – 1994 to 2015 – 2016 (Kyat Million)

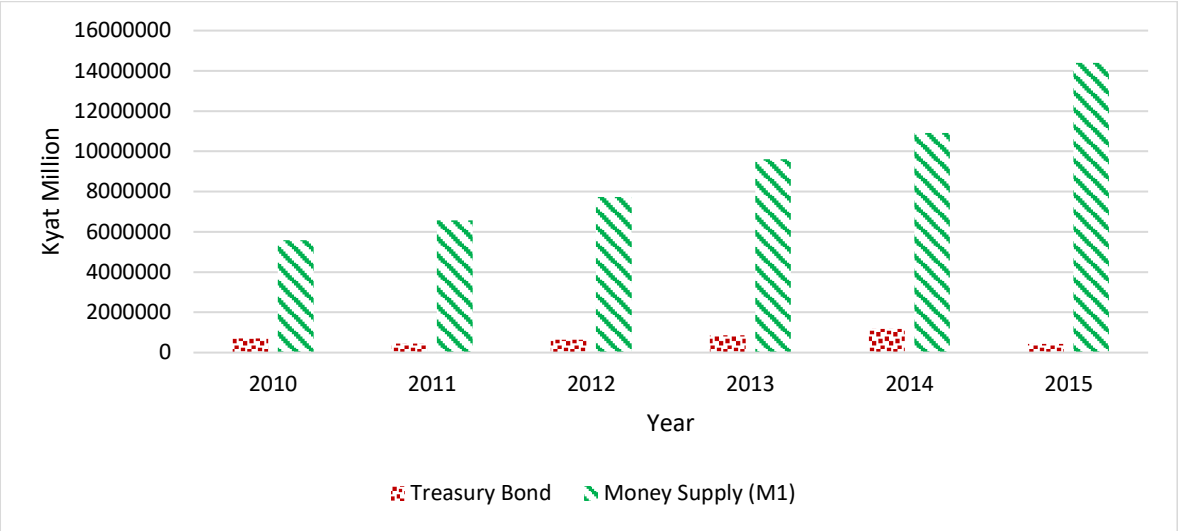


Note: Treasury Bonds include two-year, three-year and five year bonds.
Source: CSO (Various Issues)

Thus treasury bills and bonds play a big role in controlling the inflation rate. According to figures (6 and 7), the Treasury Bills and Treasury Bonds released by the Central Bank are not significantly strong enough in their use as the monetary tool. This occurs because their defined interest rate is lower than the average deposit interest rate in private banks. Private domestic banks mainly buy the treasury bonds and treasury bills more than the public because of the interest rate. Treasury bills and bonds are the one of the effective monetary tools but the difference of interest rate is the key problem. Central Bank of Myanmar published three months Treasury bills[6]interest rate is 4 percent, two year treasury bonds interest rate is 8.75 percent, Three Year Treasury bonds interest rate is 9 percent and five year Treasury bonds interest rate is 9.5 percent in 2017. The lending interest rate is 13 percent and saving account interest rate is 10 percent. People do not buy the certificates from the central bank or save money in private banks due to such big variance in interest rates. Thus, IMF (2015) also advised to allow the interest rate at Treasury-bill auction to rise.

[6] The name of three months Treasury bill is same old treasury bills.

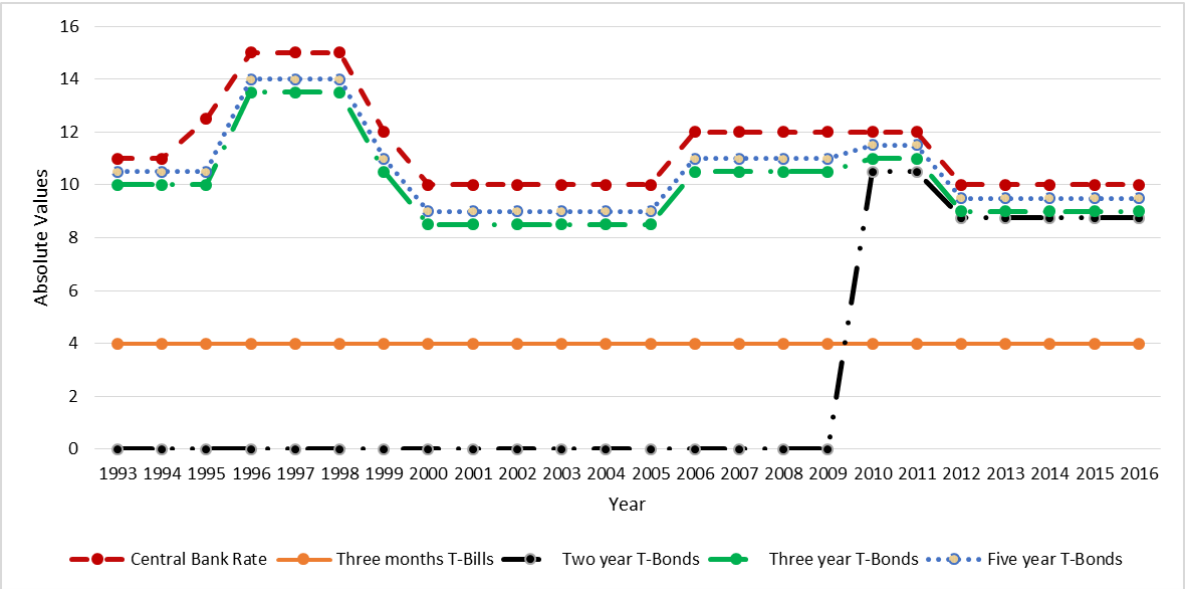
Figure (7) Comparison of Treasury Bonds and Money Supply (M1) (2010 to 2015)



Source: CSO Various Issues

Another possibility is that the public has not enough awareness to buy these treasury bills and treasury bonds. And there may be many difficulties in purchasing and selling them for the public because these activities can only be done in Myanmar Economic Bank.[7] Thus there are limitations in selling and purchasing treasury bonds and bills which are distributed by auction method in Inter-Bank market and public. This tool not working well means lack of a weapon to fight the inflation. The Governor of the CBM stated that the Central Bank will review its interest rate policy based on inflation and the fiscal deficit (Kyaw Kyaw Maung, 2018).

Figure (8) Interest Rates of Treasury Bills and Treasury Bonds 1986 to 2016 (Percent per annum)



Note: The Central Bank of Myanmar has issued two-years treasury bonds since 1st January 2010.
Source: CSO (Various Issues)

[7] Myanmar Economic Bank (MEB), was established on 2 April 1976. MEB opened 307 bank branches, 14 State and Divisional Banking Offices and 6 Head office Departments across the country.

Central Bank of Myanmar (CBM) stated that Government Treasury Bill Auction has been conducted since January 2015 in order to lessen inflationary pressure due to the bank's direct financing of budget deficit as well as to facilitate effective public debt management and market determined interest rate on government securities.

According to the figure (8), the interest rate for three months treasury bills did not change since 1993 of 4 percent. But interest rate of other kinds of treasury bonds' increased in average 4 percent in 1996, decreased average 4 percent in 1999 after the period of Asian Financial Crisis. It continued to decrease by average 2 percent in 2000. During the recovery stage of bank crisis in Myanmar, CBM raised average 4 percent of treasury bonds' interest rate and reduced it in average 2 percent again from 2012 till 2016.

1.1.8 Deficit Account of State Budget in Myanmar

Generally, the balance of payment includes three accounts, namely (a) Current Account, (b) Capital Account and (c) Financial Account.

(a) The Current Account[8] can be categorized into two types such as the Current Revenue and Current Expenditure. The Current Revenue is as following;

1. Revenues gained from sales and services, fines and other current revenue,
2. Revenues collected by certain governmental departments and organizations in accordance with existing laws,
3. Interests gained from domestic or international firms and
4. International Assistance Fund for the Current Expenditure.

Whereas the Current Expenditure is as following;

1. Costs of annual payments, transportation costs, costs of maintenance and services, transfers of expenditure, and hosting costs and other expenditures,
2. Costs for pensions and bonus
3. Costs of buying raw materials for State Owned Enterprises, Costs of production, costs of administration and research, costs of distribution, costs of commercial tax and income tax or fund transferred to State's Budget,
4. Costs subscribed annually to international associations and organizations and general grants to domestic or inter-governmental organizations such as to states and regions and municipalities and
5. Interests for Treasury Bills and Treasury Bonds and interests for external debt.

(b) Capital Account can be divided into Capital Revenue and Capital Expenditure.

The Capital Revenue is as following;

1. Revenue gained by selling capital goods, other fund received from the dissolved departments and revenue rewarded from capital expenditure

Whereas the Capital Expenditure is as following;

1. Expenditures for planning projects (e.g. factory, school, hospital, building infrastructure, roads and dams)
2. Maintenance costs for existing roads, buildings and dams
3. Costs for buying machinery materials such as cars, airplanes, ships, trains

[8] This is translated from official Burmese version.

4. Costs of office materials, furniture, cars and other office expenses and
5. Costs of service charge, compensation costs for land and other expense.

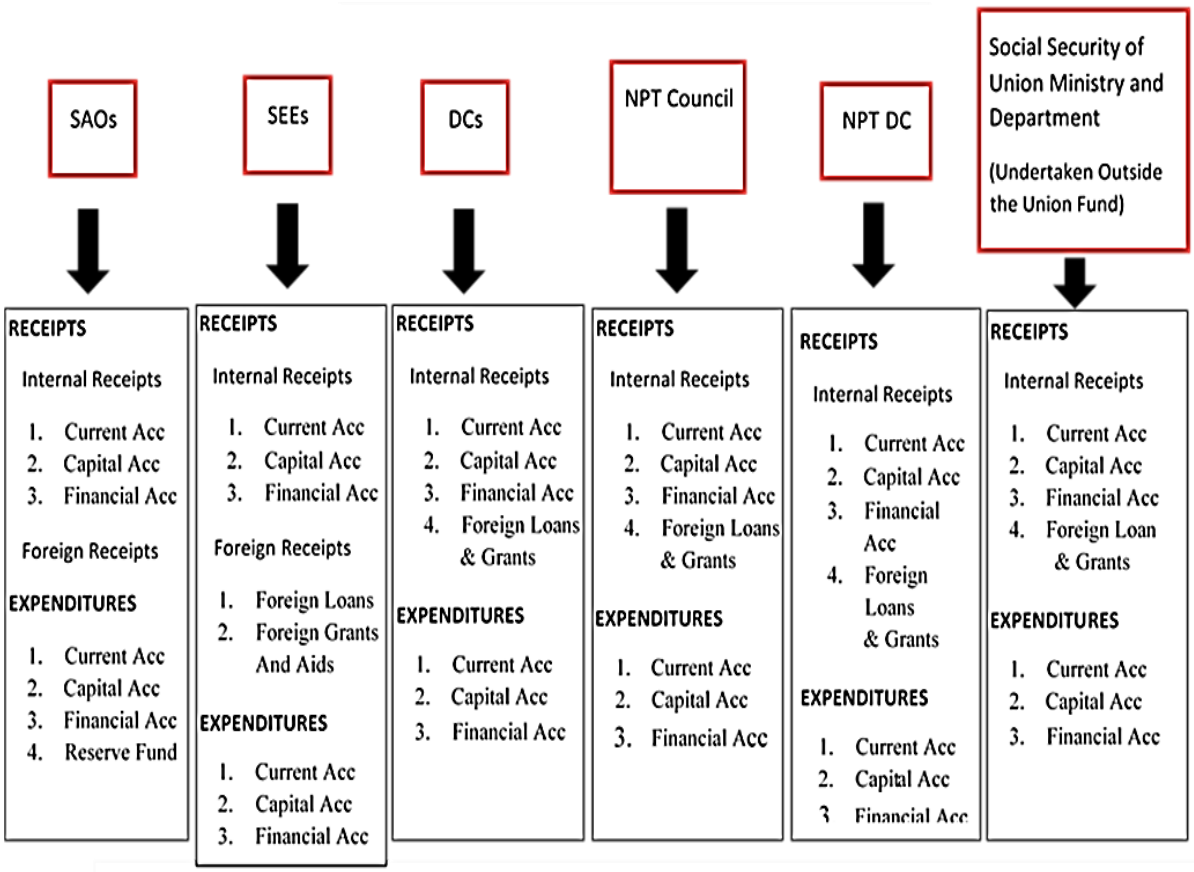
(c) The Financial Account includes the Financial Revenue and Financial Expenditure.
The Financial Revenue is as following;

1. Revenue gained from Interest and investment of domestic firms
2. Revenue gained from Interest and investment of international firms
3. Revenue gained from capital investment in organizations and
4. Savings.

The Financial Expenditure is as following;

1. Expenditure for redeeming domestic debts,
2. Expenditure for redeeming international debts,
3. Expenditure for Capital Investment in Financial Organizations and
4. Expenditure for payment on savings through saving note.

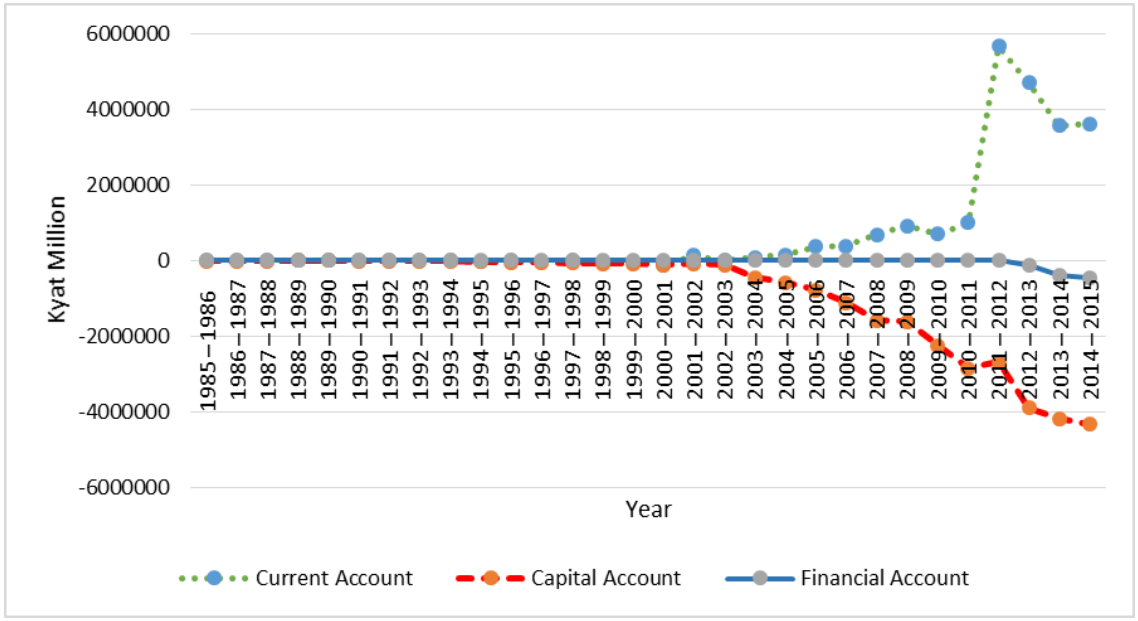
Figure (9) Organization structure of summary of the State Budget



Note: SEEs include under taken outside the union fund, NPT = Nay Pyi Taw, DC = Development Committee, Acc = Account

Source: CSO 2017

Figure (10) Balance of SAOs, SEEs and DCs (Current Account, Capital Account and Financial Account)

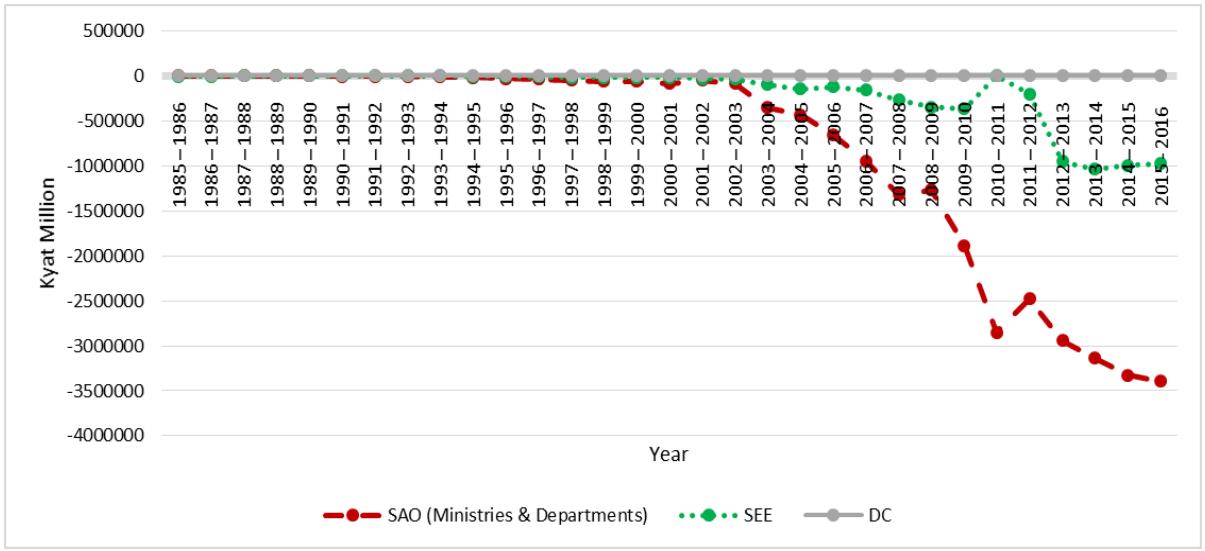


Source: CSO various issues

According to figure (10), there are six particular accounts in Summary of State Budget issued by the Central Statistic Organization mainly the Current Account, Capital Account and Financial Account. The nature and definition over these accounts are different. The Capital Account, one of the main accounts, in Myanmar faces Deficit. In the Account, budget deficits increased from the years of 2003-2004 to 2008-2009. And it increase tremendously from the years of 2012-2013 to 2015-2016.

During the fiscal year of 2012-2013, the budget surpluses occurred in the Current Account because Myanmar received international assistance as a reward for having successfully held the Multi-party Democratic General Election in 2010. However, in Current Account, Budget Surpluses significantly decreased in the year 2015-2016 while Budget Deficit dramatically increased in the Capital Account.

Figure (11) Capital Accounts Balance of SAOs, SEEs and DCs



Source: CSO Various Issues

As shown above figure (11) in according to CSO statistics, Budget deficit mainly occurs in Capital Account. To study the three main particular accounts namely SAOs, SEEs and DCs is crucial. According to in this study, budget deficits mainly occur in capital account of SAOs. The meaning of capital account can be described that the government expenses too much in building infrastructure, maintenance in existing infrastructures and office costs that lead to budget deficit in capital account.

2. Literature Review on Previous Evidences

Hondroyiannis and Papapetrou (1994) used bivariate cointegratedsystems to test the relationship between the government budget deficit and inflation by using annual data for Greece for the period 1960-2002. The Error Correction Model (ECM) points out that an increase of budget deficit results in an increase of the inflation rate.

Metin (1998) analysed the inflationary process in Turkey covering the period from 1950 -1988, using a general framework of sectoral relationships. He examined the relationship between the public sector deficit and inflation using single-equation model for inflation. He found that budget deficits significantly affect inflation in Turkey.

Darrat (2000) used an ECM to investigate that high budget deficits and inflationary consequences in Greece over the period 1957 – 1993. Empirical results found that deficit variable cause positive and statistically significant impact upon inflation in Greece.

S. O. Oladipo and T. O. Akinbobola (2011) investigated on Budget Deficit and Inflation in Nigeria: A Causal Relationship. This study provided empirical evidence on budget deficit operation in stimulating economic growth through inflation in Nigeria. Secondary data were used in this study. Granger Causality pair wise test was conducted in determining the causal relationship among the variables. The result showed those budget deficits haveeffects on inflation directly and indirectly through fluctuations in exchange rate in the Nigerian economy.

Erkam and Cetinkaya (2014) investigated the causality between budget deficits and inflation rate. Granger-causality tests are employed on monthly budget deficit and inflation data of Turkey which covers two sub-periods namely, 1987 – 2003 and 2005 – 2013. The results showed that positive significant causality running from budget deficits to inflation rate during the high inflation period (1987- 2003). But this causal link disappears during the low inflation period (2005-2013).

Oseni I. O and Ohunmuyiwa, M.S (2016) examined the direction of causality between fiscal policy and inflation volatility in Nigeria for the periods 1981 to 2014. This study used secondary quarterly time series data on fiscal deficit and consumer price index (measure of inflation rate). The data collected was analyzed using the Pairwise Granger Causality Test. This study showed that there is bi-directional causality between fiscal deficit and inflation volatility.

Table (2) Summary of Literature Reviews

Author	Country	Methods	Major Finding
Hondroyiannis and Papapetrou (1994)	Greece	Error Correction Model(ECM)	An increase of budget deficit results an increase of the inflation rate.
Metin (1998)	Turkey	Single-equation model	Budget deficit significantly effects on inflation.
Darrat (2000)	Greece	Error Correction Model (ECM)	Deficit variable cause positive and statistically significant impact upon inflation.
S. O. Oladipo and T. O. Akinbobola (2011)	Nigeria	Granger Causality	Budget deficits have effects on inflation directly and indirectly.
Erkam and Cetinkaya	Turkey	Granger Causality	Positive significant causality running from budget deficits to inflation rate during the high inflation period
Oseni I. O and Ogunmuyiwa, M. S (2016)	Nigeria	Granger Causality	There is bi-directional causality between fiscal deficit and inflation volatility.

3. METHODOLOGY

This paper investigates the relationship between inflation and budget deficit from 1986 to 2016 in Myanmar. The following time series econometric techniques are applied, Augmented Dickey-Fuller (ADF) unit root test, Cointegration test and Granger Causality test.

3.1 Summary of Empirical Analysis

Summary of Empirical Analysis are as follows;

1- Unit Root Test
2- Cointegration test (OLS Estimation)
3- Granger Causality Test

The assumption of the model is that variables are stationary at first difference. Inflation (INF) and Budget Deficit (BD) are tested whether stationary or not. The result is not stationary and then the residual should be tested that stationary or not. If the residual ADF test is greater than critical value, residual is stationary. So we can use this model. Regression of a non-stationary time series on another non-stationary time series may cause a spurious regression or non-sense regression. A spurious model is not desirable.

The ADF test is conducted first to know the data stationary property. After testing for the stationary of each variable, the author used the Ordinary Least Square estimation and residual test is investigated based cointegration test. We need to use here Engle-Granger critical values for unit root testing. Engle-Granger 5 percent and 10 percent critical values are -3.34 and -3.04 respectively. The cointegration equation can be described as following;

INF= β_0 + β_1BD+μ (eq.1)

(BD) refers to budget deficit, (INF) refers to inflation,β_0 is constant, β_1 is coefficient of BD and μ is error term. If the residual of the equation1 is found to be stationary, we can accept the model. It also means that variables in the equation 1 such as (BD) and (INF) are co-integrated or they have long run relationship between them. In other words, equation1 is a long run model. The symptom of a spurious regression is R-square value would be greater than Durbin Watson statistics. A finding of the cointegration means that even though the variables are non-stationary, they have a long-run equilibrium, or in other words, the set of variables never drift apart in the long term.

The last test is Granger causality and the purpose is to examine the causality between inflation and budget deficit using time series data. In this test, optimal lags are determined, furthermore, the objective of lags selection being to trace the relationship between the changes of present year and previous years.

4. Empirical Results and Discussion

Summary of empirical results are as follows;

1- Unit Root Testing all variables and they are stationary at 1st difference
2- Ordinary Least Square Estimation (OLS) showed long run negative co-integration between two variables.
3- Granger Causality Test showed that budget deficit cause inflation. In contrast, inflation does not cause budget deficit.

Table 3. Unit Root Test (Augmented Dickey-Fuller)

Variables	Level	Model	Critical values (CV)	ADF			Results
			5 %	T-Statistic	P value	DR	
BD	I(0)	Model (1)	-2.998064	-1.140953	0.6812	T<CV	Not Stationary
		Model (2)	-3.622033	-1.431521	0.8233	T<CV	Not Stationary
		Model (3)	-1.956406	-1.153535	0.2191	T<CV	Not Stationary
	I (1)	Model (1)	-2.991878	-0.802304	0.8004	T<CV	Not Stationary
		Model (2)	**-3.603202***	**-6.583043***	**0.0001***	**T>CV**	**Stationary**
		Model (3)	-1.955681	-0.380381	0.5365	T<CV	Not Stationary
INF	I(0)	Model (1)	-2.976263	-0.705597	0.8289	T<CV	Not Stationary
		Model (2)	**-3.574244**	**-5.185272**	**0.0012**	**T>CV**	**Stationary**
		Model (3)	-1.953858	-0.847551	0.3395	T<CV	Not Stationary
	I (1)	**Model (1)**	**-2.976263**	**-8.006794**	**0.0000**	**T>CV**	**Stationary**
		Model (2)	**-3.587527***	**-8.062618***	**0.0000***	**T>CV**	**Stationary**
		Model (3)	**-1.953858**	**-8.088477**	**0.0000**	**T>CV**	**Stationary**

Note: Model (1) = Intercept, Model (2) = Trend and Intercept and Model (3) = None of trend and intercept. I (0) = level and I(1) = first difference. BD = budget deficit and INF = inflation, DR = Decision Rule *All variables are selected under 5 percent critical value. Neither positive nor negative sign include in decision process.

According to the results (table 3) of Augmented Dickey-Fuller unit root test (ADF test) for budget deficit variable, Trace-statistics (T-statistics) value is greater than critical value, therefore, the variable is stationary at first difference [I(1)] in model 2, meaning budget deficit data has trend and intercept.

For inflation variable, all the T-statistics values are greater than all the critical values and the variable is stationary at first difference [I(1)] in all model, it is expressed that variable has trend and intercept.

The meaning of stationary variable is that there is trend and intercept in data. Stationary means there is no unit root (or) unit root means non stationary. Nonstationary refers to data is no long-run association among time period. The decision rule for the unit root test is that when the T-statistics value is greater than critical value, the variables are stationary. Therefore, both variables are integrated at first difference.

Table 4. Result of Least Squares (NLS and ARMA)

Dependent Variable: INF
Method: Least Squares
Date: 04/29/18 Time: 13:15
Sample: 1986 2016
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	24.03327	2.787015	8.623300	**0.0000**
BD	-9.46E-06	3.23E-06	-2.928936	**0.0066**

R-squared	**0.228286**	Mean dependent var	19.35007
Adjusted R-squared	0.201675	S.D. dependent var	14.22475
S.E. of regression	12.70968	Akaike info criterion	7.984945
Sum squared resid	4684.539	Schwarz criterion	8.077460
Log likelihood	-121.7666	Hannan-Quinn criter.	8.015103
F-statistic	8.578664	**Durbin-Watson stat**	**1.710418**
Prob(F-statistic)	0.006561		

According to the Ordinary Least Squares OLS regression results (table 4), the independent variable which is budget deficit (BD) is less than 5 percent, meaning that the variable is significant in explaining the dependent variable of inflation (INF). Moreover, according to the decision rule, the value of R- squared should be less than in Durbin-Watson statistics. In addition, if probability value (p-value) is less than 5 percent, the variable will be significant to explain the dependent variable. It indicates that the model is nonspurious or nonsense model. Therefore, the conclusion is that the variables which are budget deficit (BD) and inflation (INF) are co-integrated in the long run. But as the coefficient of the budget deficit showed negative sign, it means that there is negative relationship between the two variables.

Table 5. Result of Augmented Dickey-Fuller Unit Root Test on Residuals

Null Hypothesis: U has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.578351	**0.0000**
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

The study defined null hypothesis is residuals has unit root; the contrary alternative hypothesis is residuals does not has unit root.

According to the ADF unit root test for residuals (table 5), probability value (P-value = 0.0000) is less than 5% and critical value of Engle and Granger 10% is (-3.04) and it is less than the critical value of t-statistics (-6.578351). Therefore, the model can be concluded as a nonspurious or nonsense model, according to the decision rule which is p-value is less than 5% and t-statistics value is greater than Engle and Granger critical value. Therefore, both variables are co-integrated in long run.

4.1 Granger Causality Test

The study-defined null hypothesis is budget deficit does not cause inflation and inflation does not cause budget deficit. Vice versa, alternative hypothesis is budget deficit does cause inflation and inflation does cause budget deficit. According to table (5), the probability value (p-value) is less than 5%. So the deciding rule is that if the probability value is less than 5%, we can reject null hypothesis and accept the alternative hypothesis. The results showed that variables have unidirectional relation, meaning that budget deficit does cause inflation but inflation does not cause budget deficit.

Table 6. Granger Causality Tests

Pairwise Granger Causality Tests
Date: 04/29/18 Time: 13:36
Sample: 1986 2016

Null Hypothesis	Observation	F-Statistic	Probability	Lag
BD does not Granger Cause INF	29	9.17035	**0.0011**	2
INF does not Granger Cause BD		0.30928	0.7369	
BD does not Granger Cause INF	28	10.3692	**0.0002**	3
INF does not Granger Cause BD		0.28602	0.8349	
BD does not Granger Cause INF	27	5.02425	**0.0257**	4
INF does not Granger Cause BD		0.26929	0.8939	
BD does not Granger Cause INF	26	5.52897	**0.0044**	5
INF does not Granger Cause BD		0.25001	0.9333	

In the Granger Causality, the optimal lags are tested to find the robust causality among the variables. The author attempts to select various optimal lags, those two to five years. The results of the probability are same when the lags are two to five maximum. Moreover, P value is still less than 5 percent during two to five years. It means that optimal lags can be selected from two to five lags for with significant causality. In economic explanation, budget deficit does cause inflation within five years.

5. CONCLUSION

5.1 Findings

As mentioned above, inflation can be caused by variables other than budget deficits such as exchange rate and broad money. It is not sure inflation will decrease even if the budget deficit is low because of other variables.

In this study, there is seen to be long run co-integration between inflation and budget deficit and according to the Granger Causality Test, budget deficits cause inflation in Myanmar. In the real economy, budget deficit can affect inflation in the long run.

Inflation is not always caused by budget deficit; it can be caused by other factors. According to the Olivera-Tanzi effect, not only budget deficit through its impact on money and expectations produces inflationary pressure, but also high inflation itself has a feedback effect pushing up budget deficit.

Also expectations play big role in controlling inflation rate with different age groups having different expectations on change in inflation rate according to their lifelong experiences (U.Malmendier & S.Nagel, 2016). Therefore, the policy makers should manage the budget deficit and inflation not only to come under the control, but also to create appropriate policy environment.

When inflation rates of the states and regions are compared, the highest inflation rate is seen occurring in Chin and Rakhine states. Therefore, the government should take into account this issue in making appropriate inflation-combatting policy and implementation.

5.2 Policy Recommendations

CBM is trying to reduce inflation rate through absorption of money, using treasury bills and bonds in the market to reach its target. But it has not been enough to control the inflation rate. CBM thus needs to reform role of treasury bills and bonds to control inflation as monetary tool.

CBM should change monetary rules and system to collect diverse information for making right decisions, such as inflation-targeting.

CBM should change the period year of board of directors to make it different from the government period year to prevent political intervention and become more independent.

Another requirement is an announcement by the Minister of Planning and Finance and the Governor of CBM to negotiate and make public a Policy Targets Agreement (PTA), to reduce the inflation expectations of the public.

National League for Democracy (NLD) government started to change the centralized budget allocation system to a system of decentralization, with head to states and regions. That

might reduce budget expenditures, reducing the budget deficit and improving effectiveness of the expenditure of budget. It is important to build good budget allocation system because of facing complexity of statistic data between union government, states and regional governments.

Deficit occurs in capital account of SAOs in Myanmar. On the other hand, the government should expend the revenue appropriately, effectively and correctly and plan to increase the income of as well.

Final point is that to adopt the inflation-targeting policy, there is need to reconcile the real economy[9] and statistical economy.

[9] Real economy includes formal and informal sectors.

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