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Natural Gas Export Revenue, Fiscal Balance and Inflation in Myanmar

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Abstract

While natural gas exports have brought a large amount of foreign currency revenue to the Government of Myanmar, their contribution to reducing monetization of the fiscal deficit and disinflation has been obscure. The immediate reason is that under the country's dual exchange rate system, the revenue is converted at the grossly overvalued official rate which undervalues it in terms of the local currency by 1/200. However, devaluation would only improve the fiscal balance and not reduce the excess money supply since the central bank cannot sterilize the impact of the foreign reserve increase. As a policy reform to utilize the revenue for disinflation, this study proposes deregulation of the strict controls on foreign exchange.

Keywords: Myanmar, Disinflation, Natural Resource Exports, Dual Exchange Rates

JEL classification: O53, E31, Q33, F31

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Natural Gas Export Revenue, Fiscal Balance and Inflation in Myanmar¹

1. Introduction

Since 2002 natural gas exports have brought a large amount of foreign currency revenue to the Government of Myanmar. In fiscal year 2007-2008², natural gas exports amounted to USD 2.5 billion, which accounted for 40 percent of total exports. When converted into the local currency at the prevailing parallel market exchange rate, this revenue amounted to 12.4 percent of Myanmar's Gross Domestic Product (GDP)³.

The chronic fiscal deficit and high inflation due to monetization of the fiscal deficit have been ingrained problems in Myanmar. Monetization of the fiscal deficit as a percentage of GDP averaged over four percent in the early 2000s, and inflation ran as high as 58 percent per annum in 2002-2003. The large revenue from natural gas exports is expected to consolidate the fiscal balance and contribute to macroeconomic stabilization. However, there have been less pronounced changes in the monetization of the fiscal deficit, and the inflation rate for 2008-2009 remained 22.9 percent per annum.

Superficially, two things account for the scant impact of gas revenue on macroeconomic stabilization. First, as noted by the International Monetary Fund (IMF) (2007:8), under the dual exchange rate system the government applies the grossly overvalued official rate for the conversion of foreign currency revenues into the kyat local currency. As of the end of 2009, the official exchange rate was approximately 5 kyats per US dollar, whereas the prevailing parallel market rate was around 1,000 kyats per US dollar. Thus, valuating the foreign exchange surplus at the official exchange rate undervalues it by one to two hundred (1/200). Second, there is a considerable drain of gas revenue via two channels: one is payments to foreign stakeholders, and the other is unrecorded transactions that are represented by 'Net Errors and Omissions' in the balance of payments statistics. Still, the accumulation of foreign reserves has been robust, and the increase of foreign reserves in 2007-2008 amounted to over USD 1 billion, which was equivalent to 5 percent of GDP.

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² The fiscal year in Myanmar is from April 1 to March 31.

³ Official statistics report the value of exports in kyat. For the conversion here, the export value of natural gas was first converted into US dollar at the official exchange rate, then re-converted into kyat at the prevailing market exchange rate. As of the end of March 2008, the market exchange rate was 1,111 kyats/US dollar, and Myanmar's nominal GDP for 2007-2008 was Kyat 22,683.5 billion. As of writing this paper (March 2010), GDP data from fiscal year 2008-2009 were not available.

However, if the question is whether applying the market exchange rate resolves the obscure contribution of gas revenue to disinflation, the answer is no. Applying the market exchange rate for the conversion of gas revenue would certainly reduce the fiscal deficit. However, without complementary sterilization, it is accompanied by a proportional increase in the money supply, which in turn exerts inflationary pressure on the price level. With Myanmar's underdeveloped financial system, the monetary authority cannot conduct sterilization operations.

Furthermore, as will be described, the strict controls on foreign exchange aggravate the limited usage of gas revenue for stabilization. Such controls are a legacy from the period when the government was struggling with a shortage of foreign exchange. Their function has been to pool the foreign exchange available to the government; however, their side effects have been to increase the kyat expenditures of the government and hamper the absorption of kyat liquidity from the private sector. Given that natural gas exports have drastically improved the foreign exchange position of the government, strict controls on foreign exchange have become obsolete, and they do more harm than good even for the government in terms of macroeconomic management.

This paper explores measures for using the revenue from natural gas exports for macroeconomic stabilization, in particular, disinflation. It will be shown first that while devaluing the overvalued official exchange rate cuts the fiscal deficit and alleviates the monetization, it does not contain the excess money supply unless accompanied by sterilization of the large export revenue. The paper then points out where the strict controls on foreign exchange aggravate and limit the usage of gas revenue for disinflation. Lastly it will prescribe policy reform in order to make full use of gas revenue for disinflation. It is the contribution of this paper to synthesize the facts about the recent developments in natural gas exports, macroeconomic management, and foreign exchange regulations in Myanmar for policy analyses.

The structure of the paper is as follows. Section 2 assesses the impact of natural gas export revenue on the monetization of the fiscal deficit and inflation. Section 3 describes the interrelationship of export revenues, fiscal balance, and the money supply with the accounting identities of the government and the central bank. The section will show that since sterilization is not an available policy option, the excess money supply remains regardless of official exchange rate devaluation. Section 4 argues that the strict controls on foreign exchange, while pooling foreign exchange to the government, limits the capacity of the government to use the gas revenue for containing the excess supply of money. Section 5 sets forth prescriptions for policy reform to make use of the gas

revenue for macroeconomic stabilization. Such policy reform includes a change in the budget allocation system of the public sector and current account liberalization. Section 6 will summarize the analyses of this study and offer some concluding remarks.

2. Impact of Natural Gas Revenue on Fiscal Balance and Inflation

2.1 Export revenues, *drainage*, and foreign reserves

Full-scale production and export of natural gas was achieved by 2002, and it has become Myanmar's largest export item. The rise in natural gas exports has been impressive. It was virtually nil in 1998-1999, and rose to account for 40 percent of total exports within ten years, with an export value of USD 2.5 billion in 2007-2008. When converted into the local currency at the prevailing market exchange rate, this natural gas export revenue amounted to 12.4 percent of GDP in 2007-2008⁴.

FIGURE 1 summarizes the indices of Myanmar's balance of payments. The country used to suffer from trade deficits in the 1990s which led the government to opt for strict controls on foreign exchange. Natural gas exports have significantly improved the trade balance. Since the public sector monopolizes natural gas exports, the expectation would be that these exports have also contributed to fiscal revenues and improved the fiscal balance.

FIGURE 1

However, not all of the foreign currency revenue from natural gas exports is reckoned into the fiscal budget. There are two channels of *drainage*. One is the repatriation of natural gas revenues to foreign stakeholders. Such outflows have amounted to between 50 and 70 percent of export revenues in some years (IMF 2006:8). Balance of payments statistics categorize such expenditure as income (debit) in the current account. In fact, income (debit) has soared from USD 169 million in 2000 to USD 1.3 billion in 2006. As can be seen in FIGURE 1, compared with the large surplus in the trade balance, the surpluses in the current account and overall balances are not so

⁴ While natural gas exports have had a substantial impact on Myanmar's economy, its proved reserves and production are not prominent in Southeast Asia. According to the *BP Statistical Review of World Energy*, June 2009, Myanmar's proved reserves and production are 17.5 trillion cubic ft. (as of the end of 2008) and 43.8 billion cft. (for 2008), respectively. For Indonesia the same figures are 112.5 trillion cft. and 2.46 trillion cft., and for Malaysia 84.3 trillion cft. and 2.2 trillion cft.. This comparison suggests that Myanmar's relatively small-sized economy and poor export performance magnify the economic impact of natural gas exports.

remarkable.

The other channel of *drainage* is unrecorded outflows of foreign exchange, represented as 'Net Errors and Omissions' (NEO) in the balance of payments statistics. FIGURE 2 summarizes the development of NEO along with the changes in foreign reserves. NEO has soared considerably since the rise in natural gas exports. It used to be around -30 million US dollars, or within three percent of export values from 1996 through 2002. It jumped to -149 million US dollars (or 4.9 percent of total export) in 2004, -610 million (16.1 percent) in 2005, and -632 million (13.9 percent) in 2006. The negative value of NEO indicates unrecorded outflows of foreign exchange. The coincidence of the surge in NEO with the rise in natural gas exports implies that some portion of natural gas revenue has been directed to unrecorded imports by the government, or it was transferred to the private sector through unrecorded transactions⁵.

FIGURE 2

Notwithstanding the drainage of foreign exchange through the two above-mentioned channels, foreign reserve accumulation has been robust. In 2007-2008 foreign reserves rose from USD 2.35 billion to USD 3.52 billion, an increase of USD 1.07 billion. This growth of foreign reserves, if converted at the parallel market exchange rate, was equivalent to 5.2 percent of GDP for that fiscal year.

2.2 Developments in the fiscal balance and inflation

Although the sharp accumulation of foreign reserve implies the foreign currency budget of the government has achieved a large surplus, the aggregated fiscal balance in nominal terms has remained in deficit. FIGURE 3 summarizes the developments in the fiscal balance and financing methods. The fiscal deficit as a percentage of GDP has to some extent improved from around 4 to 5 percent in the early 2000s to 3 to 4 percent in 2005-2007⁶. The improvement in the fiscal balance is less pronounced in comparison with the robust accumulation of foreign reserve. The immediate reason, as noted by the

⁵ For public entities with the foreign exchange rationing at the official exchange rate, putting the rationing on the parallel market gives substantial private gains. This might be a rationale for the government to maintain the dual exchange rate system. In fact, since 2006 kyat has strengthened considerably against US dollar in the parallel market. While it is still a subject of a minute investigation in the future, the development of the parallel market rate implies an increase in the supply of foreign exchange to the market via such an informal channel.

⁶ On the basis of an implausible double digit growth rate of GDP for consecutive years, Mya Than and Myat Thein (2007) argue that the government has overestimated GDP in recent years. Overestimation of GDP would reduce the fiscal deficit as a percentage of GDP.

IMF (2007:8), is that the government values the foreign currency surplus at the overvalued official exchange rate, which grossly undervalues the gas revenue. Meanwhile, the government has financed most of the fiscal deficit by compelling the central bank to print money.

FIGURE 3

One can see in the balance sheet of the central bank some traces of the valuation of foreign currency at the official exchange rate. TABLE 1 summarizes the balance sheet of the central bank. It is due to the valuation of foreign exchange at the overvalued official exchange rate that foreign assets are disproportionately small. If foreign assets are evaluated at the prevailing market exchange rate as in Line (B) in TABLE 1, these assets become the largest item in the assets as of the end 2008. Furthermore, the increase in foreign assets surpassed the disbursement of loans to the government in 2008. Assuming that the increase in the foreign reserves of the central bank matched the foreign currency budget surplus of the government and the bulk of the fiscal deficit was financed by the central bank loans with printing money, then changing the valuation of foreign currency revenues would have eliminated the fiscal deficit completely in 2008. In other words, the fiscal balance would have actually been in surplus.

TABLE 1

Turning to the developments in the money supply and inflation, these are summarized in FIGURE 4. The growth of the currency in circulation rate has shifted around 20 percent per annum. This chronically high growth rate of money is resulted from the monetization of the fiscal deficit.

FIGURE 4

On the other hand, inflation has exhibited an unsteady trend, and no stable relationship can be observed between inflation and money supply in the short run. Rather the short-run movement of inflation may be affected by shocks such as the collapse of the rice price in 2000, and the banking crisis⁷ and the subsequent economic downturn from 2003. Nonetheless, judging from the experiences of many developing countries summarized by Fischer *et al.* (2002), the present study considers the excess

⁷ See Turnell (2003) for the chronology of the banking crisis.

supply of money as one of the causes for high inflation in the medium to long run in Myanmar. In fact, the annual inflation rate exceeded 20 percent in 2007 and 2008 after the successive years of high growth in money supply. Thus it can be argued that containing the excess money supply is imperative for disinflation in Myanmar.

3. Irrelevance of Exchange Rate in the Relationship of Export Revenue to Money

Using the accounting identities of the government and the central bank, this section will show that while valuating foreign currency revenue at the parallel market exchange rate would cut the fiscal deficit, it would not add to containing the excess money supply and to disinflation. As shown below, such inability to make use the natural gas revenue for disinflation is due to Myanmar's underdeveloped financial market where the monetary authority cannot conduct open market operations for sterilization of the large export revenue.

As the premise of analysis, three macroeconomic conditions in Myanmar are highlighted. First, under the strict controls on foreign exchange, the government compels the ministries and State Economic Enterprises (SEEs) with foreign exchange revenue to surrender it, and allocates foreign exchange rationing within the public sector at the official exchange rate. Thus, the budget of each public entity has been effectively separated into a local currency account and a local currency account, and they are not interchangeable.

Second, the underdeveloped financial market does not allow the central bank to conduct open market operations. Although the government issues treasury bonds, there is no secondary market. Commercial banks purchase the bulk of the treasury bonds and hold them until the date of maturity, whereas the central bank does not possess treasury bonds or any domestically-issued liquid securities. For the central bank, an alternative instrument to absorb excess liquidity is central bank bonds which were used in Thailand and Indonesia to cope with large capital flows in the mid 1990s (Corbo and Hernandez 1996). However, without sufficient demand for such securities from the financial market, its application for Myanmar is not feasible. Thus, at present there is scarcely any scope for open market operations to absorb kyat liquidity from the market.

Third, the government finances the fiscal deficit mostly by printing money. Some portion of the deficit used to be financed with treasury bonds in 1998 through 2000. However, since 2001 the increase in the net sales (sales minus discharged) of treasury bonds has been minimal (see FIGURE 3) as the demand for these assets appears to be

saturated. The amount of treasury bonds outstanding as of the end of 2007-2008 was Kyat 179.8 billion, or just 0.8 percent of GDP. Thus, in the following analysis, it is assumed that money printing is the only means for financing the fiscal deficit.

This analysis also leaves out changes in exchange rate within a period in order to concentrate on the impact that changing the valuation of foreign exchange poses on the money supply. It is assumed that the government can employ either the overvalued official exchange rate or the prevailing parallel market rate. The analysis corresponds to a sort of fixed exchange rate regime

Starting with the description of the government's fiscal deficit, FD , in terms of kyat, this can be expressed as follows:

$$FD \equiv (EXS - REV) + (EXS^f - REV^f) \cdot ex, \quad (1)$$

where REV and EXS refer to revenues and expenditures in the kyat account, while REV^f and EXS^f stand for those in the foreign currency account, respectively. ex is the exchange rate of kyat *vis-a-vis* foreign currency (i.e., US dollar), either the overvalued official exchange rate or the prevailing parallel market rate. A negative value of FD indicates fiscal surplus. Assuming that the foreign currency account is in surplus, i.e., $REV^f > EXS^f$, we can see that applying the parallel market rate for conversion of the foreign currency account cuts the fiscal deficit.

Next is a description of the accounting identity of the central bank, expressed as follows:

$$\Delta M \equiv \Delta R \cdot ex + \Delta B + \Delta L^g + \Delta L^b, \quad (2)$$

where the left-hand side of the identity refers to changes in liabilities; M denotes reserve money, and Δ stands for a change in each term. The right-hand side refers to changes in assets; R denotes foreign reserves and B local currency-denominated securities. L^g and L^b are credits (net) to the government and commercial banks. This is a standard accounting identity of the central bank, as in Agenor and Montiel (1999: 49), except that changes in the net worth of the central bank which come from changes in the exchange rate within a period and income from interest on assets are omitted.

In this equation, the sterilization of large export earnings can be seen as offsetting the increase in R with reduction in B , which leaves M unchanged. In the context of Myanmar, it may be approximated $\Delta B = \Delta L^b = 0$ since the central bank has no liquid securities and its credits to commercial banks are very limited. Thus, the conventional sterilization operation is not an available policy option in Myanmar.

Assuming that the government finances the whole fiscal deficit by printing money,

$\Delta L^g = FD$. Substituting this into Equation (2) and rearranging gives

$$\Delta M = FD + \Delta R \cdot ex + (\Delta B + \Delta L^b). \quad (2')$$

Given $\Delta B = \Delta L^b = 0$, changes in money depend entirely on two terms: the fiscal deficit and the changes in foreign reserve.

Applying the market exchange rate for valuation of the foreign currency account would reduce FD , which has the effect of containing monetary growth. However, that is offset by the amplified impact of ΔR on money. In other words, using the overvalued official exchange rate for valuation of the foreign currency account has a sterilization effect. While devaluation would cut the fiscal deficit, it eliminates this sterilization effect, and expands the money supply which comes from a valuation change in foreign reserves in terms of kyat local currency. This leaves the growth rate of money unchanged.

The irrelevance of the exchange rate with money growth can be demonstrated more clearly by substituting Equation (1) into Equation (2') which yields

$$\Delta M = (EXS - REV) + [\Delta R - (REV^f - EXS^f)] \cdot ex + (\Delta B + \Delta L^b). \quad (3)$$

Under Myanmar's current strict controls on foreign exchange, the private sector does not have access to foreign reserves. Changes in foreign reserves come entirely from the government's foreign currency account balance, so that $\Delta R = (REV^f - EXS^f)$. Along with the assumption that $\Delta B = \Delta L^b = 0$, Equation (3) can be reduced to

$$\Delta M = (EXS - REV). \quad (4)$$

Equation (4) is significant as it shows that whatever exchange rate is applied for valuation of foreign currency transactions, the money supply is solely determined by the kyat account balance of the government.

4. Foreign Exchange Policies Hampering Use of Natural Gas Revenue for Macroeconomic Stabilization

This section illustrates that Myanmar's strict controls on foreign exchange have had a negative impact on the limited usage of natural gas export revenue for macroeconomic stabilization. The government initially implemented the controls in order to secure scarce foreign exchange for targeted sectors. These controls have functioned to pool the foreign exchange available to the government while saving foreign currency

expenditures. Although natural gas exports have significantly improved the government's foreign exchange position, there has not been any conspicuous change in the controls.

There are two features in the controls on foreign exchange. First, within the public sector the government rations the foreign exchange budget to ministries and State Economic Enterprises (SEEs) at the grossly overvalued official exchange rate. At the same time, public entities having foreign currency revenues are compelled to surrender them to the Treasury, and they are not allowed to spend their foreign exchange earnings. Thus, the budget for each public entity is divided into a kyat account and a foreign currency account.

Accordingly, even though the public sector as a whole has a surplus in the foreign currency account, SEEs with insufficient rations from the foreign currency budget have no choice but to procure import goods through domestic private importers using the kyat budget. Additional allocations of foreign exchange to such SEEs would save kyat expenditures and reduce the excess money supply, but this is inhibited in the current budget system.

The second feature is that the controls do not permit private sector access to foreign reserves even for the purpose of current account transactions, not to mention capital account transactions. At the same time, private exporters are not compelled to surrender their foreign exchange to the government at the official exchange rate. While they have to deposit their foreign exchange in foreign currency accounts at state banks where a 10 percent export tax is levied, there is *de facto* government recognition that private exporters can dispose of their foreign currency deposits on their own imports or transfer them to others at the competitive parallel market rate. As a result, there is a segmentation of the foreign exchange market between the public and private sectors⁸.

Due to this segmentation of the foreign exchange market, the government cannot sell its foreign exchange to the private sector to absorb kyat liquidity. Assuming that there would be latent demand in the private sector for imports, and a proportional demand for foreign exchange, releasing a part of the government's foreign reserves for private sector imports would help absorb kyat liquidity from the market.

5. Policy Reform to Make Use of Natural Gas Revenue for Stabilization

⁸ The segmentation of the foreign exchange market between private and public sectors is well documented in Kubo (2007) and Hori and Wong (2008).

When considering policy reforms to make full use of natural gas revenue for disinflation, reforming the foreign exchange rationing system within the public sector would be relatively easy since adjustments would take place within the public sector. By replacing the procurement of imports using kyat with procurement using the foreign currency budget, the public sector as a whole could cut kyat expenditures which would help contain the excess money supply. In terms of Equation (3), an increase in foreign currency expenditures does not affect the money supply since $\Delta R - (REV^f - EXS^f) = 0$. On the other hand, a cut in kyat expenditures EXS accompanies a reduction in ΔM . Given the current prevailing market exchange rate, replacing one dollar's worth of imports procured from the kyat budget with the procurement from the foreign currency budget would reduce 1,000 kyat worth of money growth.

Are there any side effects of such a reform in foreign exchange rationing within the public sector? One of the focal points is whether the reform provides incentives for SEEs to demand excessive foreign exchange allocation given the gross disparities between the overvalued official rate and the prevailing market exchange rate. Two points indicate that the reform probably would not provide such incentives. First, even under the current foreign exchange rationing system, the government assesses the profit-and-loss performance of the SEEs' foreign currency transactions not with the standard of the overvalued official rate, but with a reference exchange rate close to the prevailing market rate⁹. The government uses the official exchange rate mostly for nominal bookkeeping purposes. Second, the SEEs are not operating on a self-paying basis; their budgets are integrated under the central government in the State Fund Account (SFA). The government introduced the SFA in 1990 to cope with the accumulating non-performing loans of the SEEs which were then operating on a self-paying basis. Currently the budget deficits of individual SEEs are aggregated in the SFA, and the deficit in the SFA is financed through the fiscal budget which in turn is financed by printing money. Thus, the profit orientation of the SEEs is not necessarily high.

Permitting private sector access to foreign reserves would be another significant reform in order to use natural gas export revenue for macroeconomic stabilization. In terms of Equation (3), a reduction in ΔR through sales of foreign reserves to the private sector would translate into a proportional reduction in ΔM . By permitting private sector access, it would no longer hold that $\Delta R = (REV^f - EXS^f)$. Currently, a large portion of the natural gas export revenue that is lying idle as foreign reserves at the central bank could be allocated to the private sector where it is needed which would absorb kyat

⁹ Based on author's interviews with senior staff of SEEs in Yangon, in August 2009.

liquidity and thereby help achieve disinflation. However, this reform would require thorough consideration of the side effects.

One practical issue would be the extent of deregulating controls on foreign exchange: whether to restrict the access to foreign reserves to current account transactions or to also permit capital account transactions. The more comprehensive the deregulation of controls, the more would be the demand for foreign reserves, and the more the absorption of kyat liquidity from the private sector. However, a more comprehensive deregulation might bring about more extensive side effects.

Lifting the ban on the use of foreign reserves for current account transactions must come with deregulation of controls on private imports. Since 1998 the private sector has remained subject to a kind of cash budget control on imports. This control, sometimes called the Export-First Policy, was initially implemented to cope with the deteriorated trade balance at the time. All private sector imports require permission from the government, and import licenses are conditional on the proof of export earnings to cover import bills. Consequently, importing by the private sector has been repressed as shown in TABLE 2 which summarizes developments in the trade balance by ownership. The private sector had a large trade deficit in the 1990s. But the growth of this sector's importing has been repressed since the early 2000s, and the trade deficit contained. This development can be attributed to the Export-First Policy, which since the mid 2000s the government has enforced more tightly. As the private sector's current demand for imports is repressed by the Export-First Policy, simultaneous deregulation of this control along with the access to foreign reserves would stimulate a sizable demand for imports and the proportionate demand for foreign exchange.

TABLE 2

A simple simulation of the impacts of such reform on the money supply is performed, and the results are presented in TABLE 3. The bench mark is the fiscal year 2007-2008. Lacking the means to predict the extent that policy reform would stimulate the private sector's imports, the simulation here considers three cases where imports increase by 10 percent, 20 percent, and 30 percent. Similarly, current account liberalization might affect the level of the equilibrium exchange rate. It is beyond the scope of this paper to predict the equilibrium exchange rate. Therefore the parallel market rate as of the end of fiscal year 2007-2008 is used for this simple simulation.

TABLE 3

Looking first at the impact of devaluating the official rate to the level of the parallel market rate, it would reduce the increase in the money supply that comes from the fiscal deficit (*FD*). In fact, the fiscal balance would be in surplus, which would actually cut the money supply. On the other hand, due to the change in foreign reserves (ΔR) in terms of kyat, the money supply would expand proportionately. In effect, devaluation of the official exchange rate would not cause any change in the growth rate of the money supply.

Second, by lifting the ban on foreign reserves for the private sector along with deregulating the Export-First Policy, the expected result would be an increase in private sector imports. This would alleviate the accumulation of foreign reserves which would in turn reduce the growth of the money supply. TABLE 3 shows that a 20 percent increase in imports would almost offset the growth of money coming from the gas revenue, and that a 30 percent increase would result in a fall in the money supply. These results suggest that this combination of policy reforms would be effective in reducing the excess money supply.

On the other hand, liberalization of capital account transactions would require more careful consideration. Assessments of the impact of capital account liberalization on developing countries are still divided (Edison et al. 2004; Prasad and Rajan 2008).

In the context of Myanmar, capital account liberalization implies more demand for foreign reserves, so that more excess kyat liquidity can be absorbed. However, the spread of foreign assets and the associated reduction in the kyat money balance of the private sector may have adverse effects on macroeconomic stability through another channel. Currently the government relies heavily on 'inflation tax' as a source of revenue. As the government monetizes the fiscal deficit, printing money dilutes the value of the existing money balance, which is actually a transfer of assets from the holders of money in the private sector to the issuer of money and the government, what is termed the inflation tax. The kyat money balance of the private sector is the tax base of this inflation tax. As argued by Giovannini and de Melo (1993), financial liberalization and the associated decline in the money balance requires the government to find alternative sources of revenue. Similarly, Adam (1995) noted the case of Zambia where deregulation of controls on foreign exchange prior to fiscal consolidation led to the deterioration of inflation. With Myanmar's poor track record of fiscal balance, capital account liberalization might aggravate inflation; thus such liberalization might not yet be a valid option as far as inflation is concerned.

6. Concluding Remarks

Since 2002 natural gas exports have brought large export revenue to the Government of Myanmar, and observers might expect a consolidation of the fiscal balance, easing of the monetization of the fiscal deficit, and disinflation. However, the impact of this revenue on the fiscal balance and inflation has been obscure. As noted by the IMF (2007), one immediate reason is that under the dual exchange rate system, the government values export revenue at the grossly overvalued official exchange rate. This undervalues export revenue in terms of the kyat local currency by approximately one to two hundred (1/200).

However, devaluating the official exchange rate would not solve the problem. While it would certainly cut the fiscal deficit sharply, it would lead to a proportional increase in the money supply unless accompanied by sterilization. Given Myanmar's underdeveloped financial market, there is scarcely any room for sterilization operations. This limits the use of natural gas export revenue for macroeconomic stabilization.

This paper explored measures to enhance the use of natural gas export revenue for disinflation. It pointed out the strict controls on foreign exchange that aggravate the limited usage of revenue from natural gas exports. Such controls, initially implemented in the 1990s to manage scarce foreign exchange, have worked to pool the foreign exchange available to the government. The result in the recent years has been that while the public sector as a whole has a surplus of foreign exchange, some public entities with an insufficient rationing of foreign exchange for procuring import goods use kyat from their local currency budget instead, kyat that could be saved. Furthermore, the private sector is not permitted access to the foreign reserves, and there is segmentation of the foreign exchange market between the allocation system of the public sector and the *de facto* authorized parallel market. This encourages the accumulation of foreign exchange at the central bank.

Regarding reform measures, by changing the budget allocation system within the public sector, the government could replace a part of the expenditure from the kyat budget with additional rationing from the foreign exchange budget, which would reduce the excess money supply. Also, more importantly, by removing the ban on foreign reserves for the private sector, the central bank can absorb excess kyat liquidity from the private sector.

Concerning the private sector's access to foreign reserves, restricting it to current account transactions would be a practical option in the Myanmar context. The simple

simulation performed in this study indicates that the private sector's access to foreign reserves along with a 20 percent increase in the sector's imports would stabilize the money supply. On the other hand, the experiences of developing countries suggest that capital account liberalization before fiscal consolidation encourages the private sector's switch to foreign currency assets which aggravates inflation. Thus for Myanmar, the first step toward more effective use of its natural gas export revenue would be fiscal consolidation along with current account liberalization; this could be followed later by capital account liberalization.

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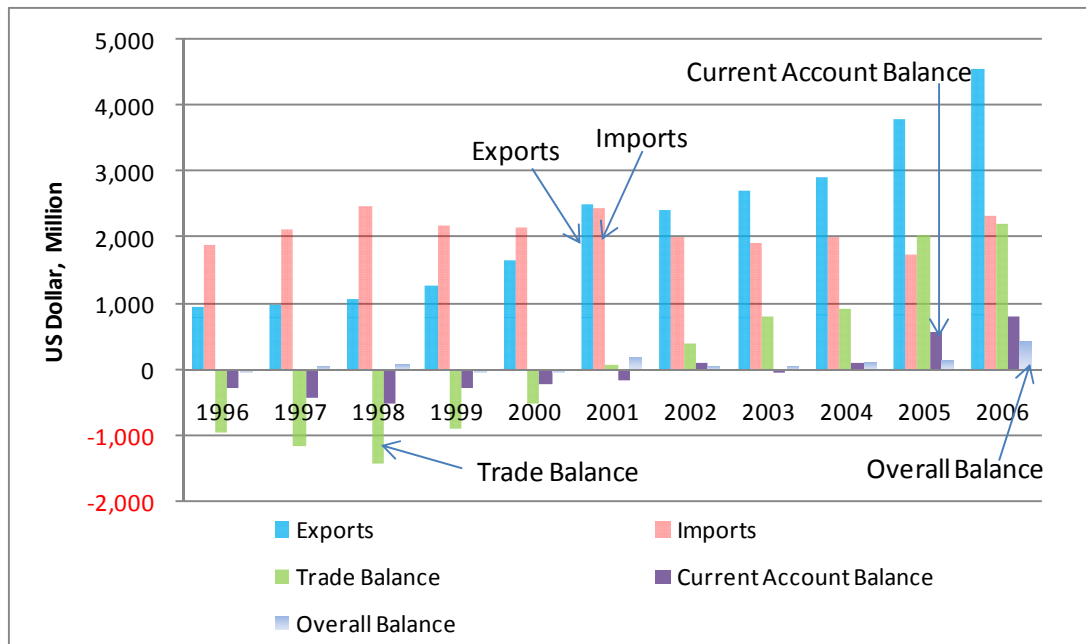
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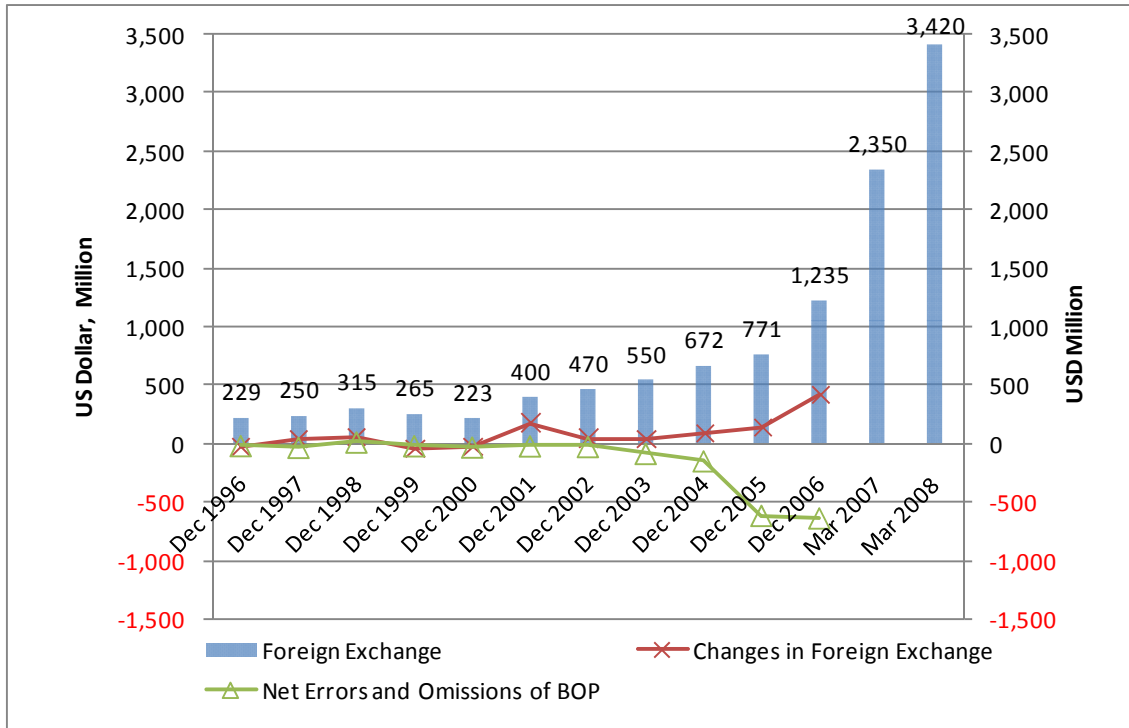
FIGURE 1
Selected Indices of the Balance of Payments: 1996-2006



Source: *International Financial Statistics* CD-ROM, International Monetary Fund (IMF)

Note: Data for 2007 and onwards are not available.

FIGURE 2
Foreign Reserves and Net Errors and Omissions: 1996-2008

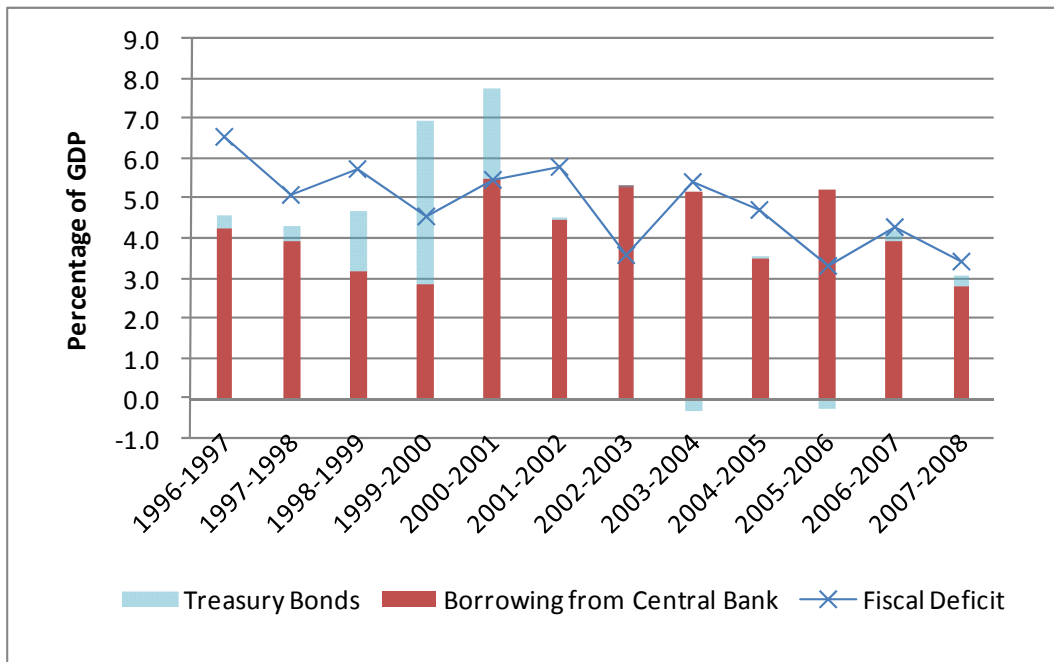


Sources: *International Financial Statistics* CD-ROM, IMF, and IMF (various issues)

Notes: “Foreign Exchange” refers to line **1d.d** of the *International Financial Statistics* for 1996 through 2006, and equivalent figures in IMF (various issues) for 2007 and 2008. “Changes in Foreign Exchange” and “Net Errors and Omissions of Balance of Payments” are based on line **79dbd** and line **78cad** of the *International Financial Statistics*, respectively.

FIGURE 3

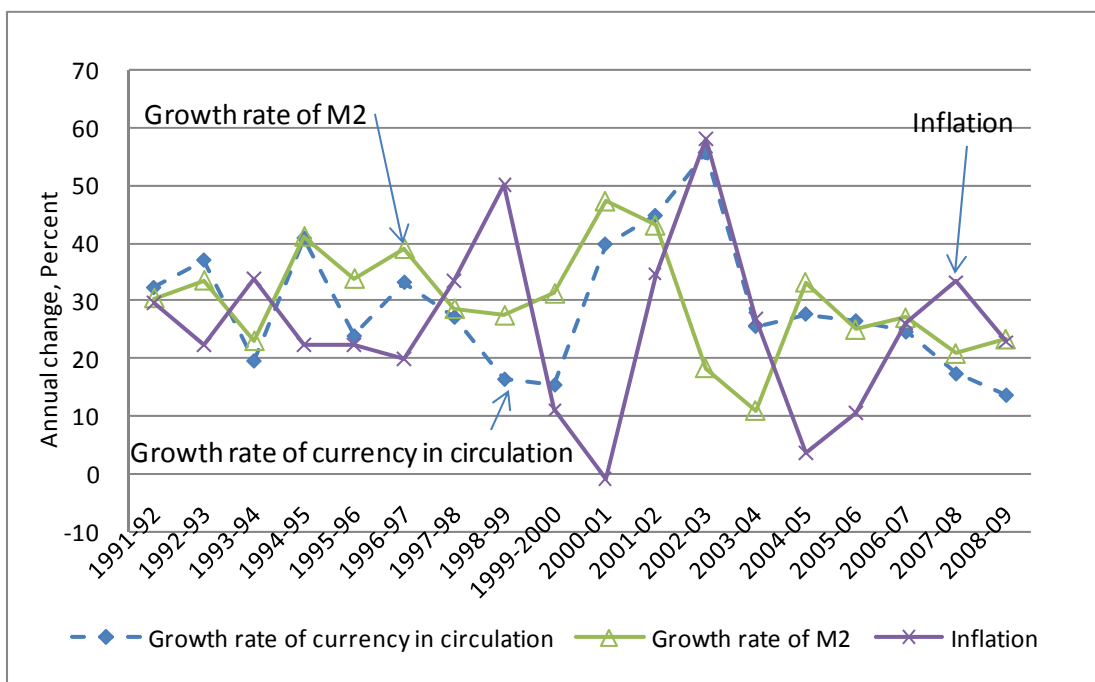
Fiscal Balance and Financing Methods: 1996/97 to 2007/08



Sources: *International Financial Statistics* CD-ROM, IMF, IMF (various issues), and *Selected Monthly Economic Indicators*, Central Statistical Organization (CSO), Myanmar.

Notes: “Treasury Bonds” refers to the net sales of treasury bonds (total sales minus discharged). “Borrowing from Central Bank” is calculated as the balance between the central bank’s claims to the government as of the end of the current fiscal year compared with the end of the previous fiscal year. Amounts of fiscal deficit and financing do not necessarily match with each other partly due to changes in prices over each fiscal year.

FIGURE 4
 Money Supply and Inflation: 1991/92 - 2008/09



Sources: *International Financial Statistics* CD-ROM, IMF.

Notes: M2 stands for the sum of Time, Savings and Foreign Currency Deposits and Demand Deposits at deposit money banks, and Currency in Circulation. Inflation is the average twelve-month inflation rate.

TABLE 1
Balance Sheet of the Central Bank

	2000	2006	2007	2008
	Kyat, million			
Assets				
Foreign Assets (net)	763	6,535	12,595	19,197
Claims on Central Government	447,581	2,762,630	3,534,690	3,880,760
Claims on Deposit Money Banks	15,918	7,206	10,897	23,932
Sub Total	464,262	2,776,371	3,558,182	3,923,889
Liabilities				
Reserve Money	431,085	2,655,170	3,393,760	3,709,490
Liabilities to Deposit Money Banks	23,847	29,876	35,462	40,800
Other items (net)	4,047	52,436	68,579	81,889
Capital Account	5,282	38,882	60,382	91,715
Sub Total	464,261	2,776,364	3,558,183	3,923,893
Discrepancies	1	7	-1	-4
Official Exchange Rate (kyat/US dollar)	6.53034	5.65575	5.38424	5.52404
(A) Foreign Assets (net) USD, million	117	1,155	2,339	3,475
Parallel Market Exchange Rate (kyat/US dollar)	431	1,264	1,280	1,207
(B) Foreign Assets (net) kyat, million	50,352	1,460,541	2,994,244	4,194,622

Sources: *International Financial Statistics* CD-ROM, IMF.

Notes: All figures are as of the end of the calendar year. (A) refers to conversion of Foreign Assets (net) from kyat to US dollar at the official exchange rate. (B) refers to re-conversion of (A) into kyat value at the prevailing parallel market exchange rate.

TABLE 2
Trade Balance by Ownership: 1996/97 - 2008/09

FY	Private Sector		Public Sector			Total	
	Imports	Exports	Imports	Exports	<i>of which</i> <i>Natural Gas</i>	Imports	Exports
	US dollar, million						
1996	1,559	605	434	323	0	1,993	928
1997	1,645	770	663	266	0	2,309	1,036
1998	1,820	745	882	337	1	2,702	1,082
1999	1,833	1,109	773	325	5	2,605	1,433
2000	1,857	1,380	463	581	171	2,321	1,961
2001	1,777	1,333	958	1,216	632	2,734	2,549
2002	1,786	1,653	511	1,422	912	2,297	3,075
2003	1,532	1,308	703	1,048	580	2,235	2,356
2004	1,354	1,262	626	1,653	1,015	1,979	2,915
2005	1,368	1,603	614	1,951	1,073	1,982	3,554
2006	1,804	2,068	1,125	3,155	2,031	2,928	5,223
2007	2,443	2,369	903	4,044	2,532	3,347	6,413
2008	2,592	2,480	1,971	4,313	2,384	4,563	6,793

Notes: The original data are reported in kyat. They are converted into US dollar at the official exchange rate.

Source: *Selected Monthly Economic Indicators*, CSO.

TABLE 3

Simulation of the Impacts of Current Account Liberalization on the Money Supply

	Private Sector Trade			Change in	Change in Money Supply			
	Imports	Exports	Trade	F. Reserve	due to	due to	Total	Growth
	Balance			ΔR	FD	ΔR	change	rate
	USD, million			USD, million		kyat, million		%
Actual 2007 at official rate	2,443	2,369	-74	1,094	641,550	5,016	646,566	27.0
Actual 2007 at market rate	2,443	2,369	-74	1,094	-568,868	1,215,434	646,566	27.0
10% increase in imports	2,687	2,369	-318	776	-568,868	861,803	292,935	12.2
20% increase in imports	2,932	2,369	-563	531	-568,868	590,385	21,517	0.9
30% increase in imports	3,176	2,369	-807	287	-568,868	318,968	-249,900	-10.4

Sources: *International Financial Statistics* CD-ROM, IMF, and *Selected Monthly Economic Indicators*, CSO.

Notes: Regarding (1) Actual 2007 at official rate, the change in foreign reserves (ΔR) is based on the change in the foreign assets (net) of the central bank's balance sheet denominated in kyat (Kyat 5,016 million), and converted into US dollar at the official exchange rate (5.1739 kyat/USD). The growth rate of money is calculated using the currency in circulated as of March 2008 (Kyat 2,394.7 billion) as the denominator.

Regarding (2) Actual 2007 at market rate, the prevailing parallel market rate as of March 2008 was 1,111 kyat's/USD. The fiscal balance in the kyat account was in deficit by (Kyat 641,550 million and + Kyat 5,016 million) and that of the foreign currency account was in surplus by USD 1,094 million. The aggregated fiscal balance was in surplus by Kyat 568,868 million.

For Simulations (3) to (5), it is assumed that the trade deficit of the private sector reduces the change in foreign reserves by the same amount, and reduces the money supply proportionately.