

Foreign Exchange Risk in the FDI decision: A Case Study of Myanmar Currency's Exchange Rates

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ABSTRACT— *Businesses engaging in foreign direct investment (FDI) need to assess foreign exchange risk of the host country. Such risks are determined by the movements and volatility of rates. The exchange rate of a currency can be overvalued or undervalued with reference to the Purchasing Power Parity (PPP) and the equilibrium exchange rate. The equilibrium exchange rate determination is challenging and constrained by data availability, time horizon and methods. A currency's current level of value (either overvalued or undervalued) and its tendency to depreciate or appreciate can affect FDI decision and strategies. The assessment and management of foreign exchange risk exposure is so crucial to international firms that the assessment should be executed before the FDI decision and for the long-term.*

This paper focuses on the theoretical aspects of foreign exchange rate, particularly the value position in comparison with equilibrium exchange rate. The empirical study was conducted for the currency (Kyat) of Myanmar which is considered as overvalued in the past. We employed an econometric model to estimate the exchange rates based on selected macroeconomic variables. The parameters were estimated using the Bayesian Averaging Method (BMA) available in the R statistical open-source software. The results of empirical study showed that Myanmar's exchange rates were moving in alignment with the economic fundamentals of the country, and shows a depreciating trend. Since Myanmar's currency is believed to be still overvalued and the economy is in transition, the paper concluded that FDI decision should be made cautiously.

Keywords— Foreign Exchange Risk, Overvalued Currency, Equilibrium Exchange Rate, Bayesian Estimation, Myanmar Exchange Rate

1. INTRODUCTION

Multinational enterprises are engaging in increasing levels of foreign direct investment (FDI) in both developed and emerging markets. As a result, the FDI in stock rose to USD 22.8 trillion in 2012 [46]. The increase in FDI contributes to the growth of world outputs as well as incomes of both investing firms and FDI recipient countries. Making that FDI decision is however not a simple task; the investment decision must take into account various factors including different types of risks, particularly political, economic and financial. Among these risks, foreign exchange risk is a crucial one, as it can cause severe losses for firms.

Every international business must assess the level of financial exchange risk before making the entry decision into a country. Variations and changes in the foreign exchange rate of the host country can result in positive as well as negative impacts. Specifically, when the currency of a host country appreciates after the investment, the assets' value can rise, but the exports from that country will be hampered by the rise in the currency's value. On the contrary, the depreciating currency of the host country may cause losses in the assets' values, although it is advantageous to export goods from the host country. In fact, the foreign exchange risk is a complex issue and there is no straight forward answer. Importantly, every FDI decision must take into consideration the host country's currency and its value fluctuations over time.

In observing the currency of a host country, it is necessary to pay attention to both its current value level as well as its historical movements. The currency's value can be basically overvalued or undervalued, stable or highly volatile. The desirable condition of a foreign currency for FDI is undervalued and stable rates (or low volatility). The undervaluation of the foreign currency is conducive to the foreign investors, as the assets will be cheaper and the country is competitive against other countries.

In order to judge whether a currency is overvalued or undervalued, it is necessary to determine the equilibrium exchange rate. This is a complex and challenging task for academics and practitioners. This paper aims to review the approaches to equilibrium exchange rate and to conduct an empirical study in line with theoretical guidance.

2. THEORETICAL ASPECTS

2.1 Foreign Exchange Rate and Volatility

Since nations issue their own currencies and there is no common currency worldwide yet, the currencies must be exchanged for the purpose of payments to, trading with and investment in other countries. Foreign exchange rate is defined as ‘the price of a unit of foreign currency, measured in units of domestic currency’ [13, p. 53]. The determination of a foreign exchange rate is closely associated with the existing international monetary system. The Bretton Woods system which set the exchange rates based on the gold backing (also known as ‘gold standard’) collapsed in 1973. Since then, until today basically the ‘market exchange rate’ is being applied. Governments are using one of the following exchange rate systems [45]:

1. *Fixed exchange rate* – The rate is fixed by monetary authority, usually pegging to a foreign currency or a group of currencies;
2. *Managed floating* – The monetary authority allows free movements of exchange rate, but with the control and intervention to remain within acceptable range;
3. *Free floating* – The foreign exchange rate is completely free to move in response to market forces, namely demand and supply of currencies.

Morrison (2009) pointed out the impacts of different exchange rate regimes on the international business. The fixed exchange rate offers certainty, but it may not be a preferable rate for an individual firm. This type of exchange rate regime has also a risk of currency devaluation by the government. The floating rate regimes, on the other hand, are flexible, with adjustments taking place in the market in which fluctuations occur in the exchange rates.

A number of authors [19, 5, 7, 3, 31, 11] highlighted the role of foreign exchange rate in making FDI decisions. Devaluation of a host country’s currency attracts foreigners to invest in that country, as asset prices are favourable [11]. Not only the lowering effects on foreign asset prices, but the lowering of production costs can also occur through the depreciation of the host country’s currency [11]. Depreciation of the host-country’s currency can lower the relative wealth of domestic firms in the host country and can result in acquisition by foreign firms and investors [11]. Likewise, investors can postpone their investments when the host country’s currency is appreciating [5] In other words, appreciation of the home country’s currency can encourage FDI.

Although it is generally true that the depreciation of foreign country’s currency stimulates FDI into that country, the reverse can be found when the exporting firm experiences appreciation in the foreign country’s currency [[11]. Thus, the FDI decision is to be made in accordance with the type of business, either cost-oriented or market-oriented as suggested and empirically tested by Chen, et al. [11]. The study by Chen, et al. [11] showed that while the depreciation of a host country’s currency tends to stimulate FDI activity of cost-oriented firms, the depreciation tends to deter FDI activity for market-oriented firms. There were also studies in the direction of the effects of the exchange rate on FDI. For instance, the study by Gay and Walelin [(2002) showed that U.S. outward FDI is particularly associated with an appreciation of the host country currency while U.S. inward FDI is negatively correlated with the appreciation of the (U.S.) dollar [11].

Another dimension of currency value in the FDI decision-making is volatility. Volatility is measured as the standard deviation of the percentage change in exchange rates projected over the year [45]. It is an indicator of foreign exchange risk; the higher the degree of volatility, the greater is the uncertainty with regard to the foreign exchange rate and hence the greater is the risk. Like the value level of a foreign currency, the volatility of the exchange rate also has an impact on the decision of foreign investors. In a study in Ghana, Kyeriboah-Coleman and Agyire-Tettey [33] found the negative impact of volatility on the FDI. However, the study by Qin [41] found that high volatility did not produce negative impacts on the FDI, when the purchasing power parity differential is low between countries.

2.2 Foreign Exchange Risk

Multinational enterprises (MNEs) opt to invest in foreign countries to tap the opportunities in production and distribution of their products. FDI is the most profitable and high-risk entry mode. According to Goldberg [22], FDI means the international flow of capital that provides a parent company or multinational organisation with control over foreign affiliates. The investment *per se* and the operating performance of an MNE are affected by many factors, such as political, economic and financial, including foreign exchange rates of the host country. There is a likelihood of losses occurring due to unfavorable changes and movements in these factors.

In the Foreign Investment Risk Matrix (FIRM) developed by Bhalla [34], the risks of FDI can be classified into political risk and economic risk, comprising the following sub-factors:

Political risk factors – Attitude of host government, conflict and corruption

Economic risk factors – GNI per capita, FDI potential, and Inflation rates

Erb, Harvey and Viskante [18] suggested five different types of risk: political risk, economic risk, financial risk, composite risk and country credit-rating. Foreign exchange risk is placed under the category “financial risk” by some authors, e.g. Fletcher & Brown [20, 32].

Foreign exchange risk refers to uncertainty of foreign exchange rates [35] and the impacts of exchange rate changes on the value of a company and/or on the volatility of cashflows [14]. Foreign exchange risk can be further broken down into structural risk, transaction risk and portfolio risk [14]. Structural risk refers to the mismatch between cash inflows and outflows due to fluctuations in exchange rate. Transaction risk occurs as a time lag exists between the time of contract and the time of payment. Portfolio risk is associated with the use of several different currencies which vary their values over time. Another typology of types of foreign exchange risk is also found in Hertzell and Caspar [24] where three dimensions of foreign exchange risk are cited as contractual exposure, portfolio exposure and competitive exposure. According to Hertzell and Caspar [24], contractual exposure is equivalent to the structural risk of Coppe', et al. [14], but the competitive exposure is additional and refers to the unfavourable impact of foreign exchange rate changes on the cost of production causing higher costs and less competitiveness. Luostarinen [35] also noted that, based on temporal differences of cash flows, the contemporary literature typically distinguishes between three types of foreign exchange exposure, namely transaction exposure, economic exposure and translation exposure [see also 4, 30].

Understanding of the above-mentioned foreign exchange risks helps the firms to assess the extent of foreign exchange exposure and then to undertake risk management in order to minimize the foreign exchange risk [14]. Undertaking foreign exchange risk management calls for a comprehensive system and it includes, according to Luostarinen [35], five distinct components: policy, position calculation, forecasting exchange rates, hedging, and performance evaluation.

The movements of foreign exchange rates are difficult to predict, if not impossible. Nevertheless, it is necessary to reduce undesirable exposure within the scope of financial management. Hagemann [23] suggested taking a long-term view such as five years in assessing foreign exchange risk, because production and foreign investments are long-term commitments. A key characteristic of long-term approach to foreign exchange management is that it does not rely on the accounting system. Instead, risks are managed from the time of investment [23]. Ankrom [4] called for top-level approach to foreign exchange management, by pointing out that “it can lose more money by neglecting foreign exchange aspect of international business than it can make by pushing for a marginal increase in international market penetration and sales” (p. 79).

A firm engaged in FDI is more or less exposed to foreign exchange risk. The extent and degree of foreign exchange risk have a major influence on the decisions of firms who are planning to invest or operate in a foreign country. There were many studies which attempted to explain the relationship between the foreign exchange risk and FDI. Clare and Gang [12] reviewed the time-series studies of bilateral FDI flows between the U.S. and some developed countries and found generally a positive relation between exchange rate risk and FDI. However, they also noted the negative findings by some researchers stating the less appealing impact of exchange rate risk on FDI.

2.3 Determination of Foreign Exchange Rate

International finance theories are concerned with what the exchange rate should be for long-term. The classical theories such as purchasing power parity (PPP), real exchange rate and various models of equilibrium exchange rate are available to determine an optimal exchange rate. Firstly, PPP is used to determine the basic exchange rate in accordance with the ‘law of one price’ [13], p. 44] and it serves as a conversion factor by expressing “the number of units of a country’s currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar” [37]. The comparison between the PPP and the actual (nominal) exchange rate reveals whether the domestic currency is overvalued or undervalued. This has been explained with the ‘Big Mac’ in the textbooks, e.g. Kotabe and Helsen [32] and Morrison [38]. There is a large gap between market (actual) exchange rate and PPP based rate. It was found even 2 to 4 times of difference between the exchange rates of emerging countries currencies and U. S. dollar [9]. The PPP is in reality applied to adjust the national output rather than to determine a practical exchange rate, as there are many factors and agents involve in the practical exchange rate determination, e.g. transaction costs. Inconsistent PPP values by different agencies applying different methods and baskets of goods also make it difficult to apply PPP [34].

An option of price-based exchange rate is available in the form of ‘real’ exchange rate which is the exchange rate adjusted with the price of foreign relative to the domestic goods and services [13]. The real exchange rate is dependent on the consumer price indices of both home and host countries. It is in fact reflecting the inflation rates of the countries.

Like the consideration of purchasing power of each currency, the foreign exchange rate can also be determined based

on the 'interest rate parity'. The higher the interest rate of the home country compared to the host country, the greater the depreciation of the host country currency [13].

A classic equilibrium model, IS_LM, is a model using aggregate demand and supply of money of an open economy. This model takes into account equilibriums in goods market and money market by incorporating national income, price level, government's budget, government's borrowing and interest rate [13]. The other general equilibrium models are Mundel-Fleming model, Balasson – Samuelson model, Redux model by Obstfeld and Rogoff [40] and Mundel-Fleming Dornbush model [2].

Among the general equilibrium models, the Mundell-Fleming model deals with the goods market, money market and balance of payment. The Balasson – Samuelson model was constructed on the maximization of profits of the firm, while REDUX model uses two countries, dynamic supply framework based on monopolistic competition, and is built with the objective of maximizing the consumers' total utility. Mundell-Fleming Dornbush model falls in the category of hybrid model (combining partial and full models) and deals with monetary equilibrium and adjustments of price and output towards the long-term equilibrium. In all these models, the balance of payment is a foundation of equilibrium exchange rate [2].

Bussiere, Zorzi, Chudik and Dieppe [8] presented and applied methodological advances in the assessment of equilibrium exchange rates. They referred to the most prominent approach to the issues outlined in the IMF's Consultative Group of Exchange Rate (CGER). Three different notions of equilibrium used in the CGER framework are macroeconomic balance (MB) approach, the external submodelling (ES) approach and the (reduced form) equilibrium real exchange rate approach (ERER). The first two use the concept of Fundamental Equilibrium Exchange Rate (FEER) by Williamson (1983, 1994) and the last one is a direct estimation method [8]. These approaches were successfully tested in the work of Bussiere, et al. [8]. However, the multiple and long time-series data of each country are required for successful application.

3. MYANMAR CURRENCY AND FOREIGN EXCHANGE REGIMES

Myanmar is well known as a resource rich country in Southeast Asia. However, after many decades of isolation under socialism and military rule, Myanmar became one of the poorest countries in the region. However, political changes took place in 2010. Myanmar is heading towards a new era of development and economic growth. A series of reforms in the economy, including monetary, financial and banking reforms were implemented. In 2012/13, Myanmar achieved an economic growth rate of 6.5 percent, and the country is expected to experience further acceleration in its future growth [47].

The currency of Myanmar, Myanmar Kyat (MMK) was exchanged with foreign currencies at fixed rates, by pegging into Special Drawing Right (SDR). Since 1977, the MMK's exchange rate was 8.56844 per SDR [39]. The (official, fixed) exchange rate of MMK per U. S. dollar was 5.3990 in 2011-2012 just before the introduction of flexible, managed floating exchange rate system in April 2012 [15]. Prior to the new regime, Myanmar had actually multiple exchange rates such as official exchange rate, unofficial (black market rate) and trade exchange rate. The 'trade exchange rate' existed for the international trade in which importers were required to earn foreign currency from exports officially or, alternatively, they could buy foreign currency from exporters in case of lacking the necessary exports. The official exchange rate was available only to the public sector, while the market rate was followed by the private sector. According to a study by IMF, Myanmar's multiple exchange rate system created various economic distortions and it was estimated that the efficiency loss was around 14-17 percent of GDP in 2006/07. The study went on to determine the equilibrium exchange rate under the unified exchange rate system for Myanmar and suggested 400-500 Kyats per U.S. dollar as being the equilibrium rate [26].

Before the unification of exchange rate on 1st April 2012, the market rate stood as high as 800 - 1000 Kyats against U.S. dollar [44]. According to the study by IMF, the MMK was highly overvalued – 19 percent in the year ending March 2011 and 40 percent in the year ending March 2012 [43]. The introduction of unified exchange rate system, specifically managed floating rate, started with the rate of around 820 Kyats which was also the market exchange rate of that time. The implementation of the managed floating rate was a challenge for Myanmar due to its limited macroeconomic management capacity [28]. The Central Bank of Myanmar was required to exercise monetary policy independently and indirectly by adjusting the interest rate, money supply and the foreign exchange reserve, etc. Therefore, the Law of Central Bank was drafted in 2013 and the necessary measures and functions are being undertaken in order to stabilize the foreign exchange rate. Since 2 April 2012, the Central Bank of Myanmar has undertaken FX auctions to keep a desirable level of foreign exchange reserve [10].

The Central Bank of Myanmar attempts to smooth the foreign exchange rates but it does not have a specific foreign exchange rate target, considering it as being risky due to the lack of data and structural transformation. But, its policy aims to build up the foreign currency reserve of at least 5 months of prospective imports [29].

The shift to the unification of exchange rates and the introduction of managed floating rate are in effect an act of currency devaluation or depreciation, especially from the view of abolishing outdated and unrealistic official exchange rate. The movements of the exchange rate for the fiscal years, April 2012 to March 2014 can be seen in Fig. 1 below. The chart shows that there was a broad currency appreciation in November 2012 followed by significant depreciation in the mid of 2013, reaching the level of 945 Kyats per U.S. dollar which is 13.5 percent lower than the initial value of managed floating system. The peak of the exchange rate reached 988 Kyats in January and February 2014. In short, Myanmar's currency has been observed to be depreciating in the last two years.

The World Bank [47] identified three factors behind the observed depreciation. First, the demand for imports such as construction materials continued to increase in response to improving business opportunities since the establishment of a new government in 2010. Second, the increased consumption such as cars followed after the relaxation of imports and exchange rate restrictions. Finally, the decline in the price of gold which resulted in switching to U.S. dollar by people who want keep their wealth in safer places.

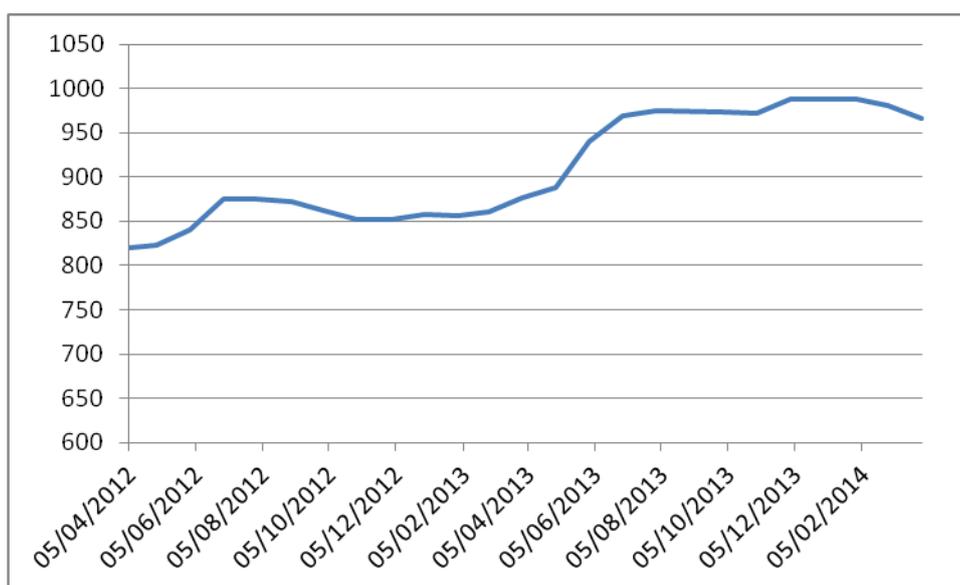


Figure 1: Movements of Kyat/USD Foreign Exchange Rate from April 2012 to March 2014

Source: Data extracted from <http://www.xe.com/currencytables/>

4. PROBLEM STATEMENT

The economic situation of Myanmar is progressing since the establishment of new civilian government in 2010 followed by a series of economic and financial reforms. The economic growth rate for the fiscal year ending March 2014 was estimated at 7.5% [2]. The accelerating growth is attributed to the rising investment, improved business confidence, commodity exports, increased tourist arrivals and government's structural reforms. The level of foreign direct investment in the financial year 2013/14 was set to double the amount of USD 3.5 billion in 2013 in and is expected to reach USD 4 billion in the coming financial year, 2014/15 (CNA. 2014)². As the economy was open and FDI flowed into the country, the trade deficit was also widened along with depreciating Myanmar currency. Imports of machinery, construction equipments, infrastructure materials and refined fuels were more than previous years. At the same time, the export sector still relied on the traditional sectors of natural gas, minerals, agricultural products and textile products. While the widening current account deficit weakened the Myanmar currency in the short-term, FDI, foreign aid and remittances could support the currency [43]. FDI and capital inflows (through formal and informal channels) had also increased the international reserve, despite the widening current account deficit [29]. In general, Myanmar's economy was moving forward smoothly after the shift of the foreign exchange regime in the last two years.

On the negative side, there were some criticisms about the exchange rate regime of the country. According to the IMF, the Kyat underwent a prolonged real depreciation in the informal market due to inflation. The currency was modestly overvalued in 2012. Its real appreciation since 2006 had outstripped that of other resource-rich competing countries [29]. However, IMF viewed that the currency movement was in alignment with the long-term fundamentals like revenues from natural resources and capital inflows, suggesting upward pressures of real exchange rate [29].

The World Bank Group monitoring Myanmar's economy reviewed the movements of exchange from April 2012 to

August 2013 and pointed out that the nominal exchange rate was increasing, i.e. depreciating, but the real exchange rate was declining, thus the currency's value was not really depreciating and thus the overvaluation of currency continued [47]. (See Figure 2.)

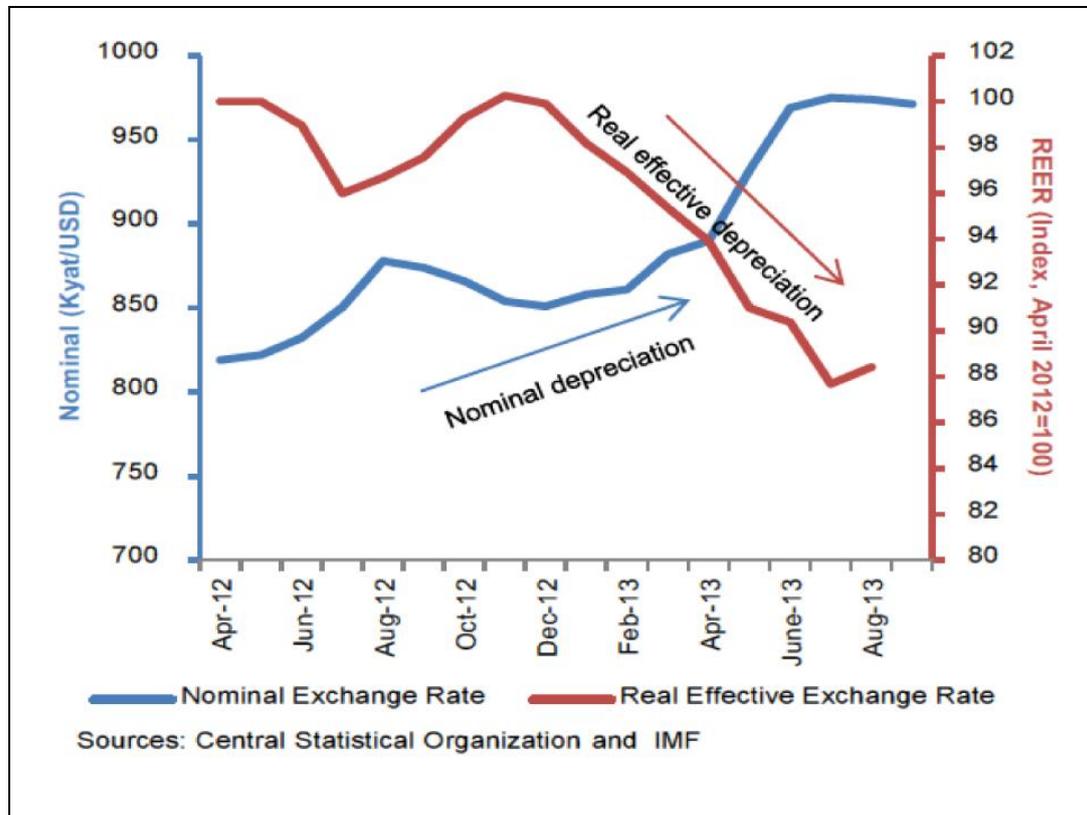


Figure 2: Nominal and Real Effective Exchange Rate

Source: World Bank (2013, p. 7)

Although the financial and monetary system in Myanmar is moving relatively smoothly and satisfactorily, the phenomenon of overvaluation of currency still exists. Overvaluation of a currency in the exchange rate can depress domestic demand while supporting imports (Pettinger, 2011). The overvaluation of a currency can also deter the flow of FDI as noted earlier [5]. Dapice, Vallely, Wilkinson, McPherson and Montesano [17] viewed the Myanmar exchange rate as a barrier of national strength. They stated that “the overvalued exchange rate increases the likelihood of greater foreign control of Myanmar’s productive assets, including land and firms and of the increasing concentration of wealth”. Myanmar’s exchange rate policy is the opposite of the Asian countries which employ significantly undervalued exchange rates as overvalued currencies are not an ingredient of national strength [17].

To assess the currency’s value, it is useful to determine theoretically an equilibrium rate and it is possible to apply econometric method and approach to do so. But, for the case of Myanmar, IMF even did not opt for this approach due to limitations in the availability of data and the transition of the economy [29].

As the currency value and exchange rate are very crucial to an economy, especially those in the transition like Myanmar, it is necessary to enquire into the equilibrium exchange rate. This paper aims to explore possibility of application of advances in this area.

5. METHODOLOGY

The concerns of whether an exchange rate is over- or undervalued and the deviation of current account from the fundamentals are examined in different methods and time horizons. The IMF (2006) developed three notions of foreign exchange equilibrium as macroeconomic balance approach (MB), external sustainability approach (ES) and the (reduced form) real exchange rate equilibrium approach [8]. This paper employs the combined

approach of the first and the third of these approaches. The MB approach is based on the multiple regression method, determining the equilibrium current account balance by a set of fundamentals, i.e. macroeconomic indicators. The relationship is estimated over a medium-term horizon of five years. This approach can suggest the necessary exchange rate adjustments by looking at the gap between the actual current account balances and the norms generated by the regression model. In the ERE approach, the ‘real’ exchange rate is estimated directly using the multiple regression method with the fundamentals of the economy like in the MB approach. In this paper, we will attempt to estimate the (actual) foreign exchange rates by using the multiple regression method with the nine selected economic indicators, namely export, import, consumer price index (CPI), inflation, currency in circulation, savings, taxes and foreign investment. The data are gathered from official statistics for the period of April 2012 to January 2014. The data in the form of index with the base, April 2012, are shown in the Appendix and the movement of each indicator is shown in the following charts.

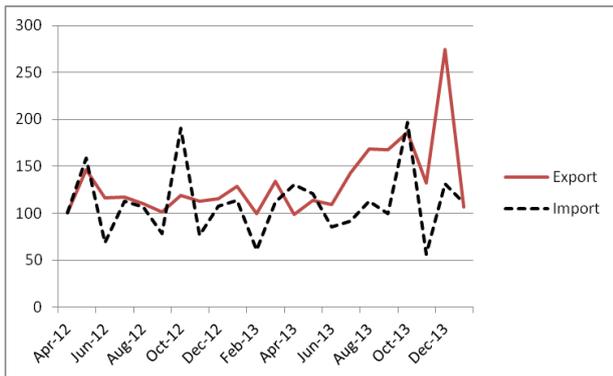


Figure 3(a):Economic Indicators (Indices)-Export and Import

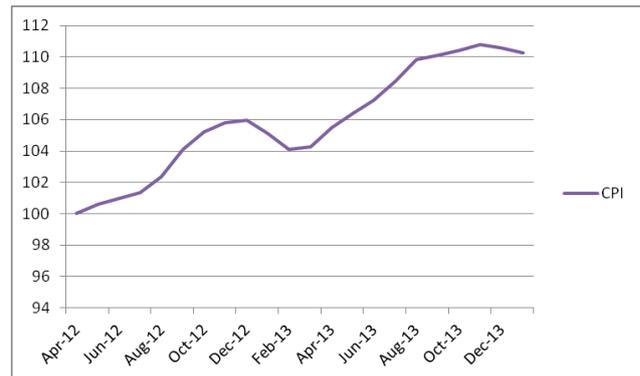


Figure 3(b):Economic Indicators (Indices)-CPI

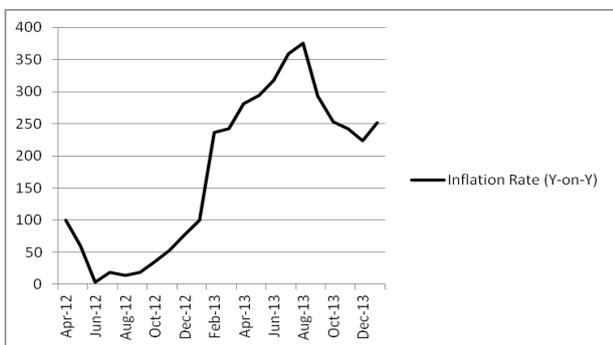


Figure 3(c):Economic Indicators (Indices)-Inflation Rate (Year on Year)

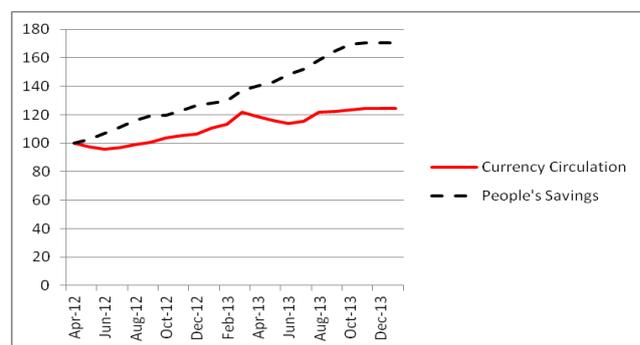


Figure 3(d):Economic Indicators (Indices)- Currency in Circulation and People's Saving

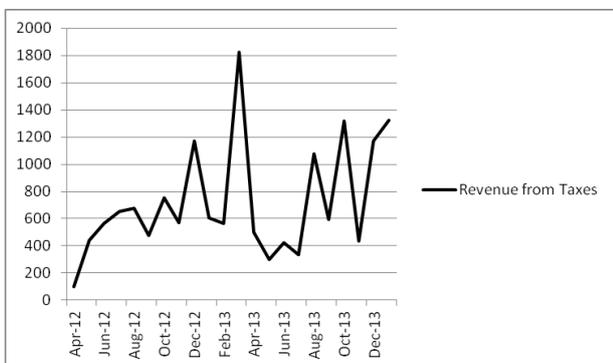


Figure 3(e):Economic Indicators (Indices)- Revenues from Taxes

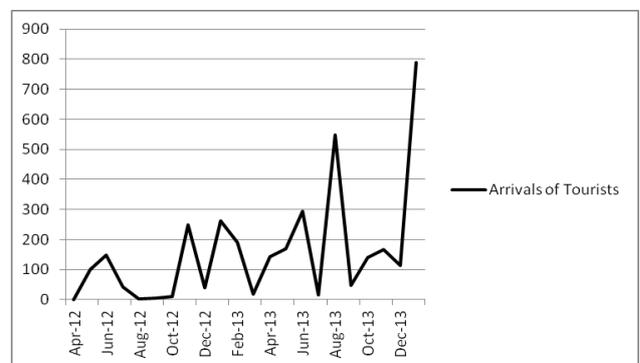


Figure 3(f):Economic Indicators (Indices)- Arrival of Tourists

The investigation of Myanmar’s foreign exchange rates will therefore apply basically the following multiple regression model:

$$Y_t = a + \sum_{i=1}^9 X_{i,t} + \epsilon_t$$

Where

Y_t = Nominal Exchange Rate at time t

$X_{i,t}$ = Macroeconomic Variable i in time t

ϵ_t = Residual value (random error)

The advances in the econometric models suggest applying Bayesian probability theory [21, 25, 42]. The Bayesian paradigm deals with the model uncertainty and it does not advocate a subset of regressors. Instead, it averages all influences over models, by using the corresponding posterior model probability (PMP) as weights[21]. This estimation of coefficient values of independent variables is known as ‘Bayesian Model Averaging (BMA)’. The model selection and estimation in this paper was carried out with the help of BMS (Bayesian Model Selection) Package available in R software.

The period of Myanmar’s (managed) floating exchange rate system is at its infancy stage, being only two years and the data are available for only 22 months. The assessment of the exchange rate in this paper is designed in a way that the first 12 months are used as the base period to estimate the model’s parameters and then the remaining 10 months’ nominal foreign exchange rates are projected using the model. The gap between the actual and projected rates is used to interpret the movements of the exchange rates in the later part, the period in fiscal year 2013/14.

6. RESULTS

The BMS package was run with 10000 draws which visited 7130 models while the model space is 256 (2⁸). The setting of prior distribution was ‘uniform’ and the ‘bd’ (Birth/Death) MCMC (Markov Chain, Monte Carlo) model sampler was selected. The results of the BMS show that the mean of the model size is 3.5947, meaning the number of regressors as 3 to 4 in the top models. The probability of inclusion in the model or posterior inclusion probability (PIP), mean and standard deviation of the coefficient of each dependent variable are available in the Table 1.

Table 1: Results of BMS

Factors	PIP	Post Mean	Post SD
People’s Savings	0.9364565	4.450802e-05	1.987279e-05
Foreign Investment	0.5913535	-3.486945e-05	3.539608e-05
Currency in Circulation	0.5600059	-2.533367e-05	2.822790e-05
Annual Rate of Inflation	0.4231432	-3.071919e+00	4.565053e+00
Revenue from Taxes	0.4045888	-2.648301e-05	4.225282e-05
CPI	0.3127632	-6.011092e-01	1.818821e+00
Export	0.1802237	-5.903153e-03	2.426423e-02
Import	0.1367269	-1.121147e-03	9.743648e-03

The top four variables which are most probable to include in the models are People’s Savings, Foreign Investment, Currency in Circulation and Annual Rate of Inflation. The presence of these and other variables in the top five models is shown in the Table 2.

Table 2: Top Five Models

	1	2	3	4	5
Intercept	8.166e+02	8.073e+02	1.040e+03	-7.118e-05	6.001e+02
Export					
Import					
CPI			-3.510e+00		
Annual Rate of Inflation			-9.764e+00		-6.545e+00
Currency in Circulation	-4.917e-05	-4.904e-05		-4.378e-05	
People’s Savings	4.573e-05	4.771e-05	6.421e-05	5.438e-05	4.133e-05
Revenue from Taxes			-9.140e-05	-5.715e-05	-7.147e-05
Foreign Investment		-4.396e-05	-7.118e-05	-6.770e-05	-7.238e-05

The top model 1 (the best model) is found to be with the intercept, 816.6, and two regressors – People’s Savings (PS) and Currency in Circulation (CC). (Marginal densities of these two factors are shown in the Figure 4).

Marginal Density: People.s.Savings (PIP 100 %Marginal Density: Currency.in.Circulation (PIP 56.

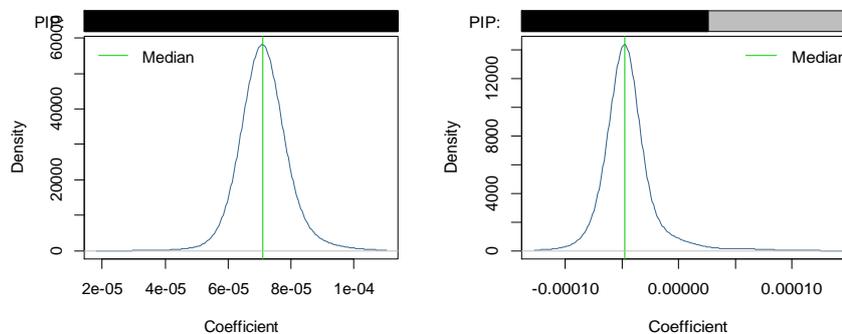


Figure 4: Marginal Density Distribution

The generated model can be expressed explicitly below:

$$Y'_t = 816.6 + 0.00004573 * PS_t - 0.00004917 * CC_t$$

where

Y'_t = Estimated nominal exchange rate at time t

PS_t = People’s Saving in time t

CC_t = Currency in Circulation in time t

The direction of the two regressors is found to be opposite to the traditional wisdom of the economic system. The increase in the supply of money is to lower the value of the currency, resulting in lower interest rate and depreciation in the foreign exchange rate. But, the model above shows opposite to the general theory. The Myanmar context shows that the increase in the money circulation did not lead to the increase in the money supply and depreciation of the currency’s

value. The increase in the circulated money has even increased the demand for the foreign currency (i.e. U.S. dollar) and the currency appreciated. According to general theory, the increase in the People's Saving should reduce the amount of circulated money and lead to the appreciation of the currency. But, the reality is again opposite, indicating that the increased savings has led to increase demand for the foreign currency and thus resulting in the depreciation of the local currency. This situation might reflect the informal sector's movements. For instance, some investors abroad could channel their money into Myanmar by transferring money through the trusted local people inside the country. Similarly, the increase in People's Saving formed the capital for businesses through the bank loans and making possible to import more capital and consumer goods.

The estimated nominal exchange rates of the first 12 months are close to the actual nominal value; the regression model's Goodness of Fit (R^2) is 0.925. Figure 5 below shows the results of estimated nominal exchange rates together with the actual values.

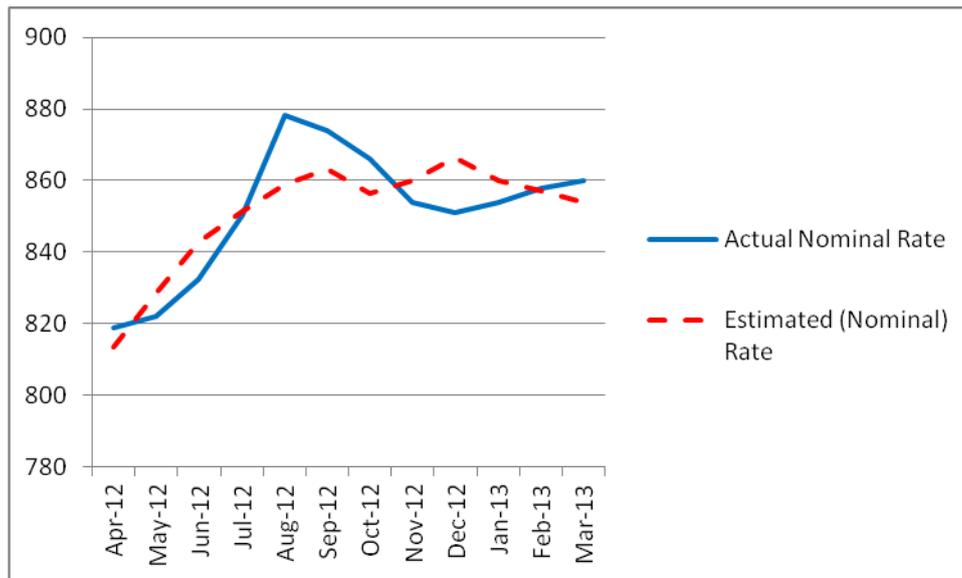


Figure 5: The Actual and Estimated Nominal Exchange Rates for the Fiscal Year 2012/13

The projected nominal exchange rates for the remaining period (April 2013 to January 2014) based on the 2012/13 are shown in comparison with the actual rates in the chart of the whole series in Fig. 6.

The result in Fig. 6 shows that the estimated exchange rates of the second year based on the first year (2012/13) is below the actual exchange rates. That means, the actual rates in the second year are relatively more depreciated than their norms produced by the regression model. The two lines are approximately in parallel and thus the slopes of the movements of the exchange rates are quite similar. The actual rate started higher than its norm especially during the months of May, June and July in 2013. In May 2013, the actual exchange rate rose from 890 to 945. In the following months, the rates stood at 969 and 975. This sudden upward movement caused the significant depreciation of the currency throughout the remaining period. Therefore, we can conclude that the actual nominal exchange rate of Myanmar currency against U.S. dollar continued to depreciating in both absolute and relative terms (with reference to the benchmark of the first year, 2012/13). The IMF and World Bank's comment of modestly overvaluation of currency in the foreign exchange rate can be undermined to an extent, especially from the point of view of fundamentals. However, since the exchange rate movement is not much different from the first (starting) year, it might be thinkable that the exchange rate policy might not be sufficient to support a faster economic growth and FDI. It is also possible that the Myanmar currency is still on the side of 'overvaluation' like in the past.

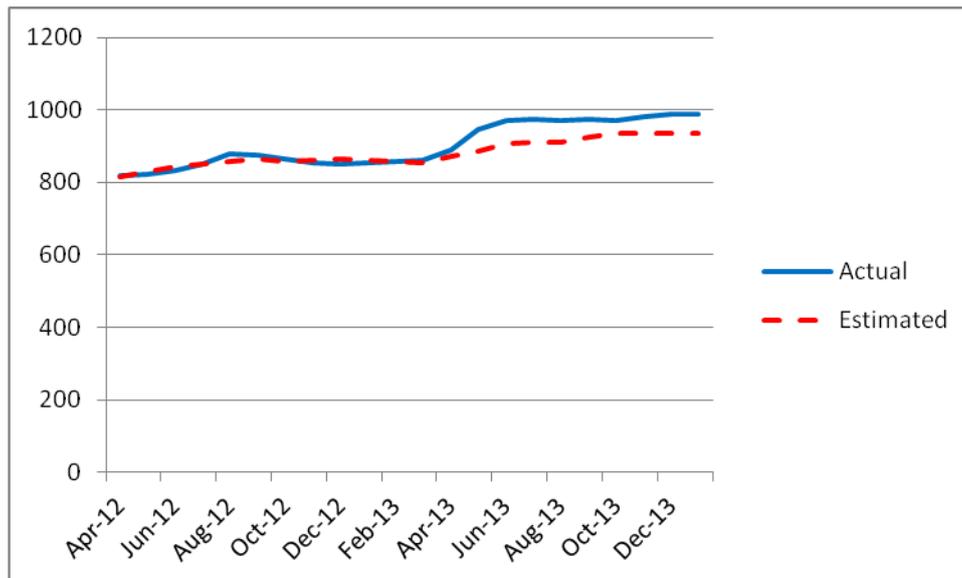


Figure 6: The actual and estimated nominal exchange rates (2012-2014)

7. DISCUSSION

The changes and developments in the Myanmar economy and the exchange rate system have some implications on the FDI and international businesses. We will assess the current situation of them firstly and then draw the implications particularly on FDI.

As the current situation, Myanmar has shifted to the managed floating foreign exchange rate system from the prolonged fixed exchange rate accompanied with other multiple exchange rates. The unification of foreign exchange regime is a major step towards the modern open economy and it can raise the efficiency of the economy. Myanmar introduced its managed floating system two years ago and there were no severe fluctuations and high volatility. The exchange rate movement was in the direction of gradual depreciation. However, the exchange rates in the last two years can be considered as overvalued based on the assessment through real effective exchange rate and the pattern of movement seen in the model application. So, the current system is still holding to an extent 'overvalued' exchange rate, as it continued with the prevailing market exchange rate of the old regime and the priority was given to stabilize the exchange rates. So far, there is little evidence that the overvaluation of the currency no longer exists.

Myanmar currency's exchange rate is so far influenced mainly by the money supply (of domestic currency) and not by the external factors such as trade and foreign investment. The interest rate was also not able to influence on the exchange rate, as it was kept at a constant rate. The current account is usually an influential factor of foreign exchange rate, but it is not the case in Myanmar. So, Myanmar currency and foreign exchange rate system is not well developed and it has to integrate with the other important factors in the future. When it happens, the exchange rate may be moving away from the present level and, thus, there is a likelihood that the currency depreciates significantly from the current level.

One of the possible reasons for decline in the real exchange rate and seemingly an overvaluation is a kind of 'Dutch disease' which refers to any upward pressure on the real exchange rate resulting from financial capital inflows [1]. Myanmar economy is receiving foreign currencies from the export of natural gas, foreign investment, informal inflows of funds from abroad and foreign aids which can increase in the supply of foreign currency and they can push upward the value of the currency. However, they may not be at the current level in the future. For instance, the increase in revenues from natural gas can reach a limit in the future. Therefore, the currency's overvaluation condition may not exist always and there can be a significant level of depreciation in the future.

As implications for FDI, the situation of currency overvaluation can attract investors differently. Although market-oriented FDI can benefit from the situation, cost-oriented firms can be disadvantaged. For example, the rising labour cost, increasing inflation and, at the same time, overvalued currency can increase much the production costs of goods which are manufactured for export to world market. The FDI stock of Myanmar is increasing, but they are not yet mainly by export-oriented businesses. The investments by MNCs are also not really much, as investors aim just for setting foot in the country with high investment potentials.

For the investors, Myanmar is a good location and a lot of opportunities can be captured. However, the economy is just moving and the real momentum is not yet achieved. Although necessary economic reforms have been undertaken

and some are underway, the economy is not yet on the right track of high economic growth. Foreign investors will be well-advised to observe the movements and developments in the foreign exchange system and its currency values. The risk level of foreign exchange rate, such as structural risk, transaction and translation risk, is rather low at the moment, but this will not be the case all the time. It is necessary to observe continuously the direction and the trend of exchange rate movements further.

We have attempted to assess the critical issue of the foreign exchange rate of Myanmar, using the econometric method and advanced approaches. The adopted method in this study is appropriate more for the medium term. The equilibrium condition in the medium and long term will help the analysts and businesses to understand the situation, to evaluate the risk level and to make appropriate right decisions. International businesses and foreign investors can monitor the country risk level assessed by the rating agency such as International Country Risk Guide (ICRG) and Economic Intelligent Unit (EIU) [27]. Meanwhile, they should also undertake foreign exchange risk assessments, specifically currency valuation either above or below equilibrium. By this way, their investment decisions can be sound and effective...

8. CONCLUSION

Foreign investment is subject to the risks associated with the host country, and the foreign exchange risk is a crucial factor in the FDI decision. The foreign exchange rate level (either overvalued or undervalued) of the host country's currency and volatility are key concerns for the foreign investors. The overvalued or undervalued vis-à-vis equilibrium exchange rate can cause the change in currency value later. If the exchange rate is overvalued, there can be loss in the value of assets invested in the host country later. MNCs should wait and see the movements and decide the right timing of investment. Foreign exchange risk should be assessed from the very beginning of their investment decisions.

The Myanmar economy underwent a series of reforms, including unification of exchange rate system. The current 'managed floating' system is a prerequisite to Myanmar's open economy. The exchange rates in the last two years show the increasing (i.e. depreciating) trend, although the real effective exchange rate was declining. Myanmar currency was overvalued in the past and the new system could achieve a smooth movement and gradual depreciation over time. The World Bank and IMF pointed out the significant inflationary pressures and the trend of currency appreciation. Therefore, it is still unclear whether the Myanmar currency is still overvalued or already close to the equilibrium.

The present study looked at the actual exchange rates and the economic indicators which are relating to the foreign exchange rates. Determination of an equilibrium exchange rate for Myanmar is difficult due to lack of data and the transition period. Nevertheless, this study applied the direct estimation method which incorporates economic fundamentals. The multiple linear regression method is adopted where the first year (2012/13) was set the bench mark period and the following year (2013/14) was estimated. It was found that the applied regression model with Bayesian approach fits very well for the estimated data in the first year. When the actual nominal exchange rates and the norms generated from the model were compared, we found a clear gap. The result reveals that Myanmar's exchange rates in the second year were depreciating from the first year. However, as the slopes in the depreciation curves are similar, we can conclude that Myanmar's foreign exchange rates were in alignment with the economic fundamentals and towards depreciation.

Myanmar economy is in the very early stage of transformation and development and Myanmar's exchange rate is basically linked to the domestic money supply. The external factors such as foreign trade and capital flows are not yet well incorporated into the mechanism of exchange rate. Moreover, the Central Bank of Myanmar is more oriented towards the stability of the economy and the accumulation of desired level of foreign exchange reserves. The significant inflows of foreign investment and foreign aids as well as increasing revenues from the export of natural gas are also dampening the process of currency depreciation moving towards equilibrium. This so called 'Dutch Disease' is supporting the overvaluation of the currency, and the monetary policy needs to react with the situation.

Due to these economic and exchange rate situations, Foreign investors need to take into account the foreign exchange risk level which can affect later at the time of lower currency value (after depreciation). The delay in investment, if possible, will be beneficial to them. Foreign investors need to decide or wait for the appropriate timing of absence of overvaluation or even the clear signs of undervaluation. As the competition among countries is high, especially in the Southeast Asia region, and since the government's monetary policy will need to orient towards higher economic growth, further currency depreciation is required. That will be the ripe timing for FDI into Myanmar. We believe however that it would happen sooner than later.

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Appendix: The Nominal Exchange Rates and Selected Economic Indicators (April 2012 = 100)

Month	Actual Exchange Rate	Export	Import	CPI	Annual Rate of Inflation	Currency in Circulation	People's Savings	Revenue from Taxes	Foreign Investment
Apr-12	100	100	100	100	100	100	100	100	0
May-12	100.36	146.20	158.31	100.63	60.51	97.20	102.78	441.14	100
Jun-12	101.63	116.11	68.33	100.99	3.58	96.07	106.91	563.54	147.31
Jul-12	103.84	117.14	113.12	101.37	18.97	97.01	111.06	653.34	43.08
Aug-12	107.21	109.83	106.72	102.35	14.35	99.08	116.01	674.62	2.88
Sep-12	106.71	101.34	77.945	104.13	18.97	100.78	119.39	476.65	5.04
Oct-12	105.73	119.34	190.47	105.24	34.87	103.90	119.92	750.81	10.00
Nov-12	104.27	113.13	76.52	105.81	53.33	105.30	122.67	571.96	247.98
Dec-12	103.90	115.83	107.72	105.98	75.89	106.51	126.31	1172.59	38.36
Jan-13	104.27	128.91	113.89	105.13	100	110.94	128.41	605.60	260.99
Feb-13	104.76	99.59	60.29	104.11	236.92	113.39	129.74	566.44	189.71
Mar-13	105.00	134.30	111.59	104.25	242.05	121.76	137.02	1824.44	17.28
Apr-13	108.66	98.23	130.30	105.47	281.53	118.58	140.30	497.31	142.74
May-13	115.38	113.78	120.35	106.40	293.84	116.16	142.79	302.34	169.22
Jun-13	118.31	108.85	85.47796	107.26	317.94	113.83	148.37	421.98	294.83
Jul-13	119.04	142.66	91.15901	108.46	358.46	115.23	151.85	335.53	16.33
Aug-13	118.68	168.56	112.64	109.85	375.89	121.60	158.11	1078.52	547.57
Sep-13	118.80	167.72	99.16	110.09	293.33	122.54	164.92	595.32	47.50
Oct-13	118.68	186.05	197.06	110.42	252.82	123.15	169.32	1316.61	139.23
Nov-13	120.02	132.47	56.23	110.80	242.05	124.53	170.54	434.14	166.15
Dec-13	120.51	274.45	131.6636	110.60	224.10	124.53	170.54	1171.86	112.80
Jan-14	120.51	106.24	110.80	110.28	251.28	124.53	170.54	1324.54	788.73

Source: CSO, 2013 and 2014.