

Two Fallacies in Taiwan's Monetary Policy

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Abstract

We argue that the Central Bank of the Republic of China (CBC) has made two mistakes in its monetary policy making in the past few years. The first fallacy is that the CBC has been over-estimating the interest rate elasticities of both investment and consumption, and has induced interest rates to an unnecessarily low level. And the second one is that the CBC has been over-estimating the exchange rate elasticity of exports, and has induced the exchange rates to an unnecessarily low level. These low-rate policies would have large welfare costs. We conjecture that the CBC might follow some policy rules, but simple scenarios show that both the Taylor rule and a modified one proposed in this paper do not well predict CBC's discount rates, its main policy instruments. Surprisingly, the federal funds rates of the Federal Reserve Bank of the United States are a much better predictor for CBC's monetary policies.

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I. Introduction

Since the end of 2000, the interest rates and exchange rates in Taiwan had been decreasing to very low levels, which are only next to Japan, the country with the lowest level in both rates in industrial countries. A decreasing interest rate would induce the depreciation of domestic currency (hereby the New Taiwan Dollar (NTD)) through the usual mechanism of interest rate parity (IRP). And a lower exchange rate, or a cheaper NTD, would stimulate exports and therefore let Taiwan accumulate more trade surpluses and foreign reserves if the well-known *Marshall-Lerner conditions* were satisfied. Because Taiwan's economy has been export-oriented, it seems that the second lowest level in both rates in industrial countries has not been a serious problem for the economy. But in this paper we will argue that this is not the case.

The factor responsible for Taiwan's low interest rates was supposedly the declining domestic consumption and domestic investment. This is true, but not true enough. In this paper we want to show that, if there were no fallacies in Taiwan's monetary policy that we will discuss later in this paper, both interest rates and exchange rates would not fall to such low levels as we have observed, even though the declining domestic demand has still been the main reason for the decrease of both rates. How much of the interest rate falling results from fallacious monetary policies is of course an empirical problem, which we would not answer in the current paper.

Rather, we would like to illustrate from historical data that the Central Bank of the Republic of China (Taiwan's central bank, henceforth CBC) has been *intentionally* inducing both interest rates and exchange rates to low levels because it has incentive to do this. The incentives or benefits of conducting this "low-rate policy" are obvious: low interest rate would encourage domestic investment and consumption, and cheap NTD would stimulate net exports. This is one of the main reasons why both of these two rates have been so low in Taiwan for the past few years.

But any economic behavior has its *opportunity costs*, and it is the causes and effects of these costs that we want to discuss in the following paragraphs. And because these costs have large pecuniary effects, we would like to argue that these low-rate monetary policies, as conducted by the CBC, are in fact fallacious. More precisely, the CBC has been (1) over-estimating the interest rate elasticities of both investment and consumption in Taiwan, or misinterpreting Chapter 12 in *The General Theory* of John Maynard Keynes (1936), which is usually considered as the rationale

of low-interest-rate policies, and (2) over-estimating the exchange rate elasticity of Taiwan's exports, or misinterpreting Marshall-Lerner conditions, which are the theoretical foundation of low-exchange-rate policies.

It is hard or even impossible to *prove* that the CBC's monetary policies are fallacious, since first the Governor of the CBC would never admit that they are, otherwise he would step down or CBC would lose its credibility in monetary policy making, and second and probably more importantly there have been very few viable empirical evidences in the estimation of the interest rate elasticities of investment and consumption as well as the exchange rate elasticity of exports in Taiwan. There is therefore no basis to empirically determine whether the monetary policies of the CBC are indeed fallacious.

The approach adopted here is therefore only descriptive. We use the actual behavior of the CBC to figure out its behavioral pattern. This pattern could result from a *discretionary* monetary policy or simply from a policy *rule*. And we use different models to simulate the values of nominal interest rates, and then to compare them with the actual values of discount rates of the CBC. Following Kydland and Prescott (1977) the discretionary policy can be derived from an optimization problem of the CBC, which minimizes a loss function with both inflation and unemployment rate as its arguments, subject to short-run Phillips curves. But because the focus of the present paper is on interest rates and exchange rates, which are absent in the optimization problem above, we would not discuss the case of discretionary policy here, and would leave it for future studies.

There are two simple models we want to discuss in this paper. These models or *scenarios* are: (A) a *Taylor rule*, as created and extended by John Taylor (1993, 2007), and (B) a *modified Taylor rule*, as proposed here to incorporate federal funds rates as its new elements. We can therefore empirically determine whether these models are consistent with monetary policies of the CBC. Of course more econometric works might be necessary to rigorously evaluate the results. But our simple models could still give us some useful information about the effectiveness of monetary policies.

In Section II we use data to demonstrate the low-rate policies of the CBC and hence the two fallacies. Section III presents two models we use to evaluate the effects of monetary policies of the CBC, and discusses the simulation results. Section IV summarizes.

II. Fallacies in Monetary Policies of the CBC

According to the implications of IRP almost every time when the Federal Open Market Committee (FOMC), the policy making unit of the Federal Reserve Board (henceforth, Fed) of the United States, decided to lower its target of the federal funds rate, the CBC would immediately lower its discount rate, but *not* vice versa. Figure 1 provides a clear illustration of such an asymmetry.¹ A higher federal funds rate would in general not induce a higher discount rate in Taiwan because a higher US interest rate would result in depreciation in NTD if the CBC would just do nothing in its monetary policy making. And because a cheaper NTD would cause exports to increase, this result has been welcomed, or at least not been resisted, by the CBC. The asymmetry in setting interest rates is understandable, but the thesis of this paper is that this asymmetric behavior, if over-emphasized, would contribute to the very low interest rates and exchange rates as we have observed in Taiwan. Following are two fallacies of the CBC we claim and their plausible causes and effects.

Fallacy # 1: To stimulate domestic demand, the CBC has been over-estimating the interest rate elasticities of both investment and consumption in Taiwan, and therefore has induced interest rates to an *unnecessarily* low level.

Taiwan has been in a recession for the past few years, and accordingly the CBC had reduced the targeting discount rate for many times. The official statement of the CBC was usually to promote domestic demand such as domestic consumption and investment. Whether the low-interest-rate policy could work depends on the magnitudes of the interest elasticity of domestic demand.

But, as many economists since Keynes has acknowledged, the interest elasticity of investment would be much smaller when the economy is in a depression. This is because Keynes had said that “Most, probably, of our decisions to do something positive, the full consequences of which would be drawn out over many days to come, can only be taken as a result of animal spirits...” (1936, p. 161), and “...economic prosperity is excessively dependent on a political and social atmosphere which is congenial to the average business man.” (p. 162). The most important factor an average business man would consider in a recession is not the cost of borrowing capital, or interest rate, but the prospect of investment opportunity, or the political and social *atmosphere*. Animal spirits become more important in such situations.

¹ This figure was provided by Lin Yu-Wen, with some modifications.

Taiwan's domestic investment has been low for the past few years especially since 2001. And the foreign direct investment (FDI) is also at a low level. If the interest elasticity of investment would be large, or at least not small, both domestic investment and FDI would have a significant increase because Taiwan's interest rates would have been very low. But, on the contrary, this did not happen.

The main reason for the decreasing investment as well as consumption in Taiwan perhaps rests on what Keynes had said of the "political and social atmosphere". Though the recession was mild, it has still lasted for a few years since 2000. Both consumers and firms might have been losing their confidence in Taiwan's economic prospect, so the interest elasticity of consumption is also small. The credit crunch for consumption loans created by the credit card turmoil a few years ago had a great negative impact on Taiwan's consumer spending. This made the interest elasticity of consumption even lower.

There has been a political controversy within Taiwan and between Taiwan and China. The political conflicts would make the social atmosphere more uncertain and the investment environment riskier. And this in turn makes the interest elasticity of investment even lower. If the political and social or even ideological conflicts in Taiwan could not be resolved peacefully, lower and lower interest rates could not help build the confidence of the average business man, and therefore could not effectively increase investment. The CBC should recognize this, and if it does, the interest rate would possibly return to its *neutral* level, the concept often mentioned by the Governor of the CBC.

Fallacy # 2: To stimulate foreign demand or exports, the CBC has been over-estimating the exchange rate elasticity of Taiwan's exports, and therefore has induced the exchange rates, or the value of NTD relative to foreign currencies, to an *unnecessarily* low level.

As said above the foundation of using undervalued currency to promote exports is the criterion of Alfred Marshall and Abba Lerner. The problem therefore rests on the magnitudes of both the price (exchange rates) elasticities of exports and imports in Taiwan. Here we would like to focus on the exporting side because the purpose of the CBC is usually to promote exports rather than to restrain imports.

The top two largest exporting markets for Taiwan are now China (indirectly through Hong Kong) and the United States. Because there are political conflicts

across the Taiwan Strait both of the RMB (China's currency, or yuan) and NTD could not circulate on the other side of the Strait. The problem is therefore mostly on the USD/NTD exchange rates. As many data have shown NTD is now the second weakest currency against USD among industrial countries, next *again* only to Japan.

How does it come? The problem stems both from the financial account and the current account. The current account balance has been positive for many years, and this would let NTD appreciate relative to the USD, other things being equal. But there could be one important thing among these "other things" not equal: would American consumers continue to import goods from Taiwan year after year without changing their price elasticities of imports (that is, the price elasticities of the exports of Taiwan)? If the answer is no then we could not reach the conclusion that a depreciation of NTD would induce more exports to the United States.

My conjecture is that the answer is probably *no*. A possibility could be that if there are many substitutes of Taiwan's exporting goods, say those from countries such as China, Europe, or Japan, then the price of Taiwan's exports should be much lower in order to attract the original American consumers. This means that a larger depreciation of the NTD would be required to get the same amount of exports as before. In other words the exchange rate elasticity of exports in Taiwan would be getting smaller and smaller when there were more and more competitors coming from around the world. The feasibility of the Marshall-Lerner conditions would therefore be reduced. In this sense Marshall-Lerner conditions could probably have been misinterpreted by proponents of the low-exchange-rate policy. Nevertheless this is still an empirical question to which we have no answer at this moment.

If the value of NTD has been decreasing over time the answer must equally come from the financial account. The balance of financial account is by definition the difference between capital inflow and outflow, or net capital inflow. An increase in net capital inflow to Taiwan would let the NTD appreciate, and a decrease in it lets NTD depreciate. Obviously if the NTD went down, it would probably be the consequence of the decrease in net capital inflow, other things being equal. Are there any evidences supporting this result? The answer is affirmative and there are at least two of them that we would like to discuss here.

The first reason for the decrease in net capital inflow is the decline of interest rates in Taiwan. The discount rate of the CBC had fallen since 2000 to the lowest level of 1.375% in June 2003, and in the same time the federal funds rate of the

United States also fell to 1%, a historical low. Though the discount rate rose in the next Board Meeting of the CBC in September 2003, it has never come back to the level as was in 2000. As we know the IRP implies that the capital outflow would increase, and this means that the NTD would depreciate.

The other evidence had come to our notice more recently: the *carry trade*, one thing that CBC would never admit its existence in financial transactions in Taiwan. Because the CBC had denied its existence we could only infer the propagation mechanism of it *indirectly* through some other evidences. Maybe we could never know if there has been such trade in Taiwan, unless the CBC would someday tell us the truth. But anything has side effects. By this we mean that some other sources of data would reveal what was happening even without CBC's official affirmation.

The most famous case for the carry trade was what happened in Japan in late February 2007. It was said that the burst of China's stock market in late February and early March this year had something to do with the carry trade that had occurred in Japan. Here is the story. When foreign investors and hedge funds managers predicted that the Bank of Japan (the central bank of Japan, henceforth BOJ) would very likely plan to increase its interest rate from 0.25% to 0.5% in late February, but not did it yet, they borrowed from banks in Japan at the then still lower interest rates and invested the money in foreign currencies or other short-run equities that had higher rates of return.

This arbitrage behavior made Japan's currency (yen) appreciating at the first moment because, as collateral to borrowing, foreign investors would at first exchange their currencies or equities for yen. This increases the demand for yen and hence yen appreciates relative to these foreign currencies. Then the borrowed yen would be invested abroad to buy assets with higher rate of returns. And when the profits of these investments realized some of the money (in terms of yen) would return to Japanese banks to pay back the original loan. The supply of yen increases and this in turn would make yen depreciating. Recall that Japan had the lowest level of interest rates in the world, so not all of the money would go back to Japanese banks immediately since there would be more investment opportunities abroad.

The process of carry trade thus creates a special pattern of the exchange rates movements for the domestic country, that is, they went up (appreciated) immediately just after the trade had occurred, and then went down (depreciated) after a while (a few days or longer) with a smaller magnitude than that when they went up. This

would result in an *inverted J-curve*, a curve with its left, a steeper and longer upside part, and its right, a less steeper and shorter downside one. This is the operational definition of carry trade in our minds, and we can use the data of Taiwan's exchange rates to see if there has been carry trade in Taiwan.

Figure 2 and Figure 3 would show these results clearly.² In Figure 2, the case of Japan, there was a big appreciation of yen against USD from about 121 to 116 yen per USD in late February 2007, and then the yen went down to about 118 in early March. This has been the strongest evidence supporting carry trade that had occurred in Japan. Actually in mid August there also seemed to be a carry trade happening, and again probably another one in mid October.

Figure 3 demonstrates the case of Taiwan. The most probable case of carry trade would be in late May. Just after this year's second Board Meeting of the CBC on June 21st, some reporters asked Governor of the CBC about whether there were carry trades in late May and mid June in Taiwan. One of the answers provided by the Governor was that because NTD is not an international currency, there would be implausible for carry trade to happen in Taiwan. Is this answer viable? We as well as the exchange rates data would like to offer a negative reply to it.

Take a look at Figure 3, and then we will see what happened. In Figure 3 we have observed that in the second half of May NTD had appreciated relative to USD from 33.4 to about 33 per USD. This probably had nothing to do with the increase in interest rates because the latest change in discount rates was on March 30th, almost two months earlier. So what is the other explanation except for carry trade? Maybe this was due to capital inflow for some other unknown reasons, maybe not. But CBC's answer is still unwarranted.

And what about the problem of NTD as not qualified as an international currency? We think that whether the currency can circulate internationally is not a legitimate prerequisite for carry trades. Perhaps the degree of capital mobility would be more important for them. Though NTD cannot be circulated outside Taiwan, the borrowers or carry traders could still exchange it for other international currencies, such as USD, yen, British pounds sterling, or euro, to invest abroad. This can explain why the exchange rates movements in the bottom of the inverted J-curves were flatter in Taiwan than those in Japan.

² These two figures were prepared by Tsao Tian-Shin.

First, this flatness means that those foreign investors may not only borrow money to invest abroad, but to invest in local targets such as Taiwan's stock market. This may be a reason why there was a short-period boom in Taiwan's stock prices since June. This may be related to the increases in interest rates, but our explanation might be another possibility. Second, the flatness indicates that because carry traders would exchange the borrowed NTD for international currencies to invest abroad, this would make NTD to depreciate, and this in turn would cancel out some (but not all because now the NTD is more expensive) of the appreciation of the NTD beforehand. We would therefore observe an inverted J-curve with a flatter bottom in countries without their own international currency.

III. Has the CBC Been Following a Policy Rule?

In Section II we have claimed that the CBC had made two mistakes or fallacies in making its monetary policies. These two fallacies have one thing in common. They were all about manipulating prices to promote effective demand. In the first fallacy, the prices manipulated are interest rates, and in the second, the exchange rates. And through the international mobility of financial capital, or the working of IRP, these two fallacies are closely related to each other. Are the costs of using the fallacious policies large enough to worry about? Yes, it has been, and would continue to be, if the CBC were still to over-estimate those two price elasticities, and to keep pushing both interest rates and exchange rates in Taiwan to even lower levels.

If we pay some attention to the statistical data in Taiwan, then we would find some evidences of the opportunity costs when the CBC had adopted wrong monetary policies. For example, the discount rate of the CBC was 1.625% on October 1st, 2004. Then it had been raised to the level of 2.875% on March 30th, 2007, in a speed of 0.125% for every three months in two and a half years (the CBC has four regular Board Meetings each year). But *surprisingly* the CBC had increased the discount rate by a double figure (0.25%) to 3.125% in the next Board Meeting on June 22nd. This is the only time the CBC had increased the discount rate at such a large magnitude, so it is worth exploring. This increase in interest rates was very likely a reaction to the plausible carry trade that was supposedly to occur in late May and early June in Taiwan, as mentioned in Section II.

Some people, like CBC, might argue that the reason for increasing interest rates was quite simple: consumer price index (CPI) inflation. But this is unwarranted because the annual CPI inflation rate was quite low in May and June, and in fact they were -0.02% and 0.12% respectively. In July it was -0.34% , even lower. So there was no inflation problem before August 2007. One other explanation in newspapers had been that the government wanted to attract capital from abroad to invest in Taiwan's stock market because of political purposes (there will be both congressional and presidential elections in 2008 in Taiwan). This might be true, but it would be very difficult to verify it. Besides, the CBC had also denied it. We are, therefore, inclined to believe that there was indeed a carry trade in late May or early June this year.

Another evidence came from financial account balances. The equity investment abroad, a rough estimate of short-run net capital outflow, had increased by more than 6 billion USD from the first quarter to the second one in 2007. Though we could not say that this huge money was all directly related to the carry trade, it is a reasonable conjecture for this capital outflow had fallen by nearly 10 billion USD in the third quarter in 2007. We have no proof that the 0.25% increase in discount rate by the CBC in the June meeting had had such a big influence on the behavior of investors and hedge funds managers such that the capital flight was stopped by the monetary policy. Again, this is an empirical problem and still we need the CBC to tell us what was really going on.

In what follows we try to use two versions of the Taylor rule to see if the CBC had practically adopted a policy rule. Or rather, it has used no rule or has followed an unknown rule that is not invented by John Taylor or any others. The Taylor rule could be stated as:

$$R = \pi + 2 + 0.5(\pi - 2) - 0.5(\text{GDP gap}) \quad (1)$$

where R is nominal federal funds rate (or discount rate, if for Taiwan), π is CPI inflation rate, and GDP gap is the percentage shortfall of real GDP from an estimate of its natural level. And a modified Taylor rule is assumed to behave according to:

$$R = \pi + 1 + 0.2(\pi - 1) + 0.4R' - 0.4(u - 4), \text{ when Fed rates went down} \quad (2)$$

$$R = \pi + 1 + 0.4(\pi - 1) + 0.2R' - 0.4(u - 4), \text{ when Fed rates went up} \quad (3)$$

where R' is the federal funds rate and u is the unemployment rate in Taiwan. The

modified Taylor rule has two parts because we want to capture the asymmetric behavior of the CBC as described in the beginning of Section II. When Fed lowered its funds rate Taiwan usually followed immediately, but not vice versa, so we put more weight on R in equation (2), and less weight on R' in equation (3) when the rates went up. The CPI inflation rates are also adjusted to fit the average value in Taiwan, so we give it a value of 1%, which is less than the original 2% in Taylor's rule.³

The remaining problem is about the *neutral* real interest rates. Ben Bernanke once said that he thought that a reasonable value of it would be 2%. This is consistent with the setup of Taylor rule. The Governor of the CBC often talked about neutral interest rates but he never claimed or implied its value in his official talks. This is understandable. According to the nominal interest rates level as well as the inflation rate we think a 1% level would be comfortable for the neutral real interest rates. So we pick it in both equations (2) and (3). The average unemployment rate in our sampling period (2000Q1 to 2007 Q3) was about 4%, and the reason that we do not use the original GDP gap as used by Taylor is that we do not have reliable long-run steady state data on real GDP.⁴ And according to Okun's Law we can use the difference between natural unemployment and actual unemployment rates to replace GDP gap as argued by Mankiw (2006, Chapter 14).⁵

Figure 4 provides results of these two scenarios. We see that the Taylor rule does not predict CBC's discount rates well, nor does the modified Taylor rule, though it fits better. The latter also captures the trend better than the former does, but both scenarios have much volatility in the prediction of discount rates. The actual interest rates are much smoother than those generated by the two models. But maybe to everyone's surprise the most fitted series to discount rates in Figure 4 is the federal funds rate, especially in the parts when both rates are falling. This is actually an implication of IRP, and also the result of the asymmetric behavior we have said in previous section. What is surprised is that it fits much better than the other two rules!

³ We admit that the choice of these weights is arbitrary, and its relevance should be a theoretical problem that we could not discuss here.

⁴ When calculating the GDP gap in equation (1) we use the difference between sample average GDP growth rate and the actual GDP growth rates. This is a proxy for the GDP gap.

⁵ Mankiw multiplied the unemployment gap by two in order to match Okun's Law. We did not do so because we do not find robust evidences on such an Okun-type relationship in the data of GDP and unemployment in Taiwan.

IV. Summary

In a recent article Robert Lucas, the 1995 Nobel Laureate in economics, had said: “To me, inflation targeting at its best is an application of Milton Friedman's maxim that "inflation is always and everywhere a monetary phenomenon," and its corollary that monetary policy should concentrate on the one thing it can do well -- control inflation.” The most important work of central banks is inflation targeting, according to Lucas, but what else the central bankers can do, and could do it well?

This is a difficult problem. Ever since the discovery of Phillips curve and the explanation of it later by Paul Samuelson and Robert Solow, the central bank has tried to manipulate the trade-off between inflation and unemployment. The benefits and costs of this story are familiar to most economists. Because in the short run monetary policies still have effects on real variables, this leaves room for central bankers to make various active policies. The recent subprime mortgage crisis provides the Federal Reserve Board with very tough works to do. Though the CBC does not face the same problem, it still has the responsibility for maintaining economic prosperity and stability.

The low-rate policy that we have discussed in this paper is, I think, the policy that CBC has used to reach the goal of providing the society with prosperity and stability. The purpose might be good, perhaps not necessarily right, but the methods the CBC used are definitely wrong. The aim of either low interest rates or low exchange rates is to stimulate spending, domestic or foreign, and hence to increase the national income. But there are at least two problems about the effectiveness of such policies. First, consumption depends mainly on consumer's wealth or permanent income. When there is a recession and the duration of it would be expectedly long, consumers would delay or reduce their expenditures, and in such a situation the interest elasticity would decline. This means that a low-rate policy would have smaller, not larger, effects on consumer's spending. The same argument can be applied to the case of investment. But in pessimistic situation investment depends more on animal spirits, and again average businessmen would postpone their investment projects to avoid potential risks. This means that a low-rate policy would have smaller, not larger, effects on producer's spending.

Second, if the price inflation stems from oil shock or from increasing price of other raw materials, then the low-rate policy would do little help in restoring

economic prosperity. This is because in this case the bad shock is coming from aggregate supply side, not aggregate demand one. Low interest rates and exchange rates could at best stimulate spending, or the aggregate demand, but could not make the prices of raw materials lower, so the problem will still not be resolved by the central bank.

The CBC should be careful about its monetary policy making. The response of the CBC to recent FOMC decisions was very abnormal because usually the CBC should decrease the discount rate when FOMC had lowered the federal funds rate. But the fact was that FOMC had lowered the rate for three consecutive times for a full percentage since September 18th, the discount rate in Taiwan rose twice in the same period with a 0.25% increase for each. Does this mean that the CBC will be fully independent of the Fed, and Figure 4 would no longer mimic its behavior, or that there indeed has been carry trade in Taiwan and the CBC was forced to raise the interest rates to restrain the possible capital flight? Or, is there a third possibility that because the CPI inflation has been very high, CBC must do something to control it, so CBC went back to the work that it supposedly should do: *inflation-targeting*, as argued long ago by Friedman and more recently by Lucas? To this we still have no good answers.

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Figure 1

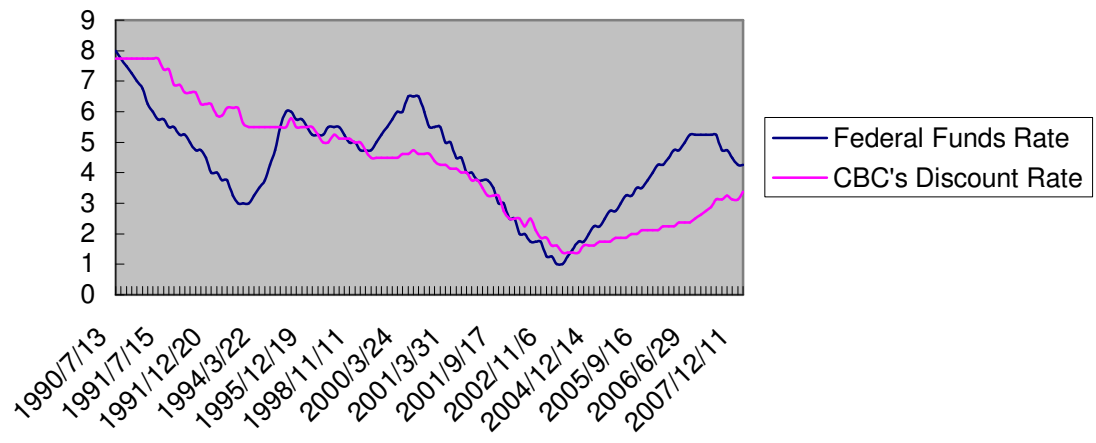


Figure 2

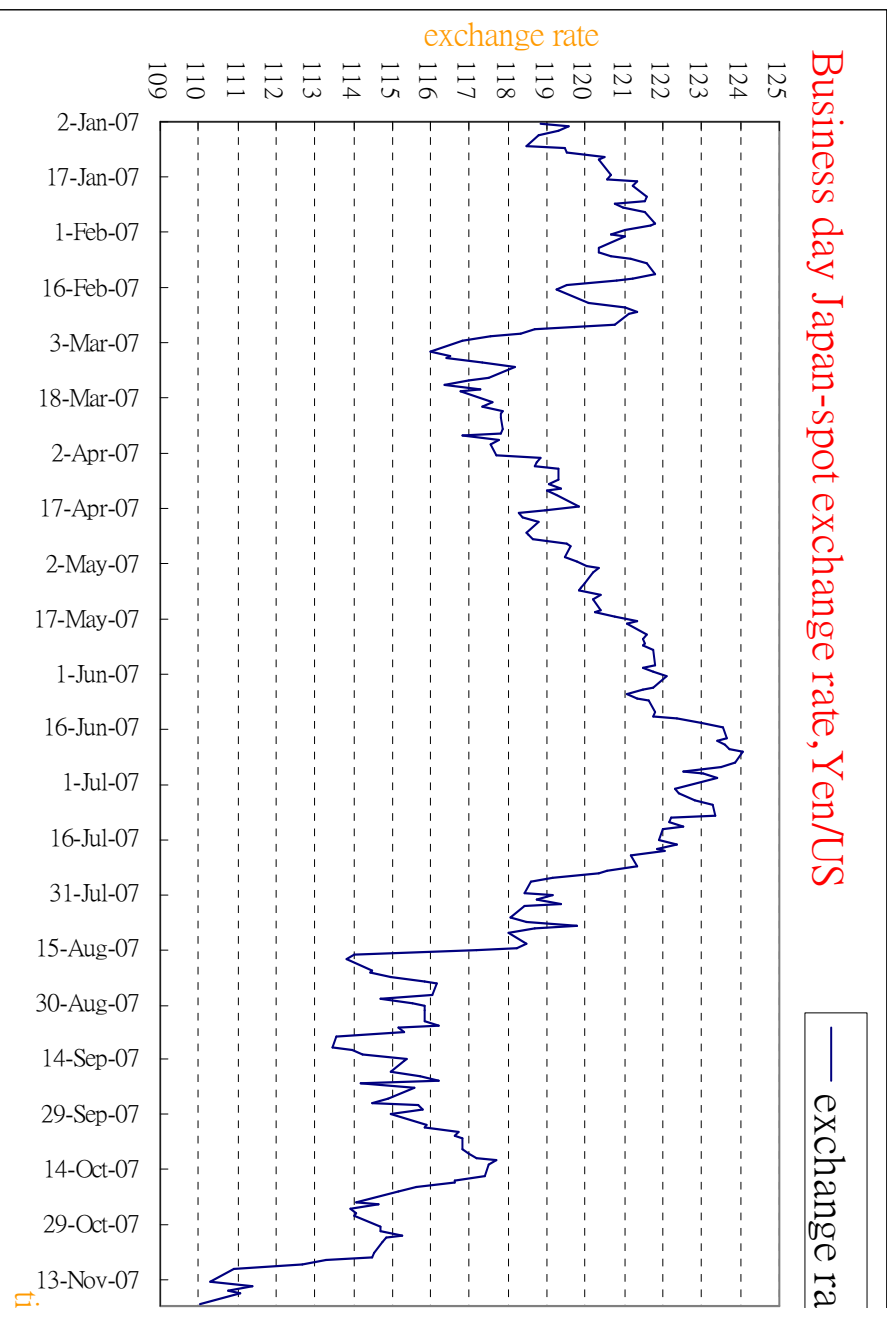


Figure 3

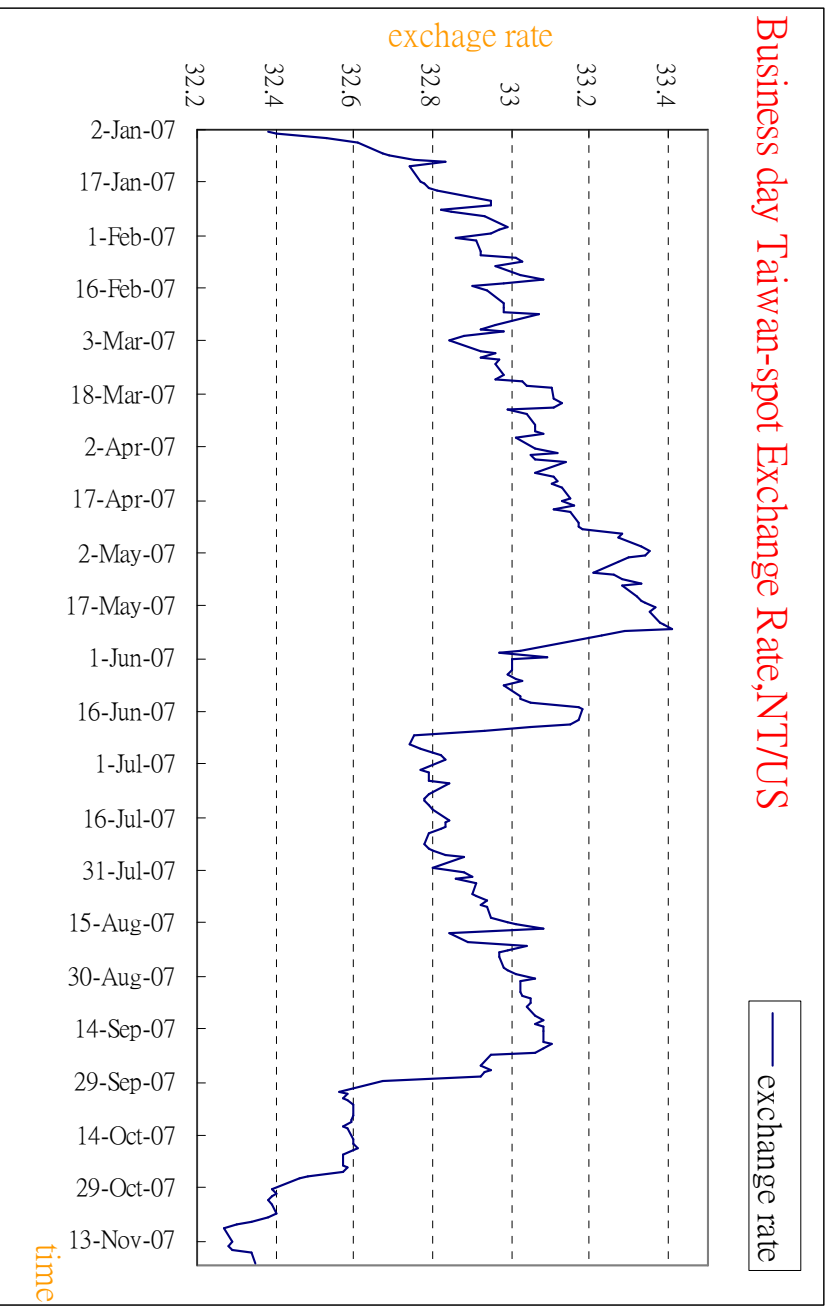


Figure 4

