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Working Paper Series Vol. 2004-24
September 2004

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The International Centre for the Study of East Asian Development, Kitakyushu

EVALUATING THE IMF's POLICY PRESCRIPTIONS FOR THE TROUBLED ASIAN COUNTRIES: THE CASE OF THAILAND

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ABSTRACT

The Thai government has borrowed $13.47 billion out of the $17.2 billion IMF standby credit agreement signed in August 1997. Since the level of international reserves is sufficiently high at $32 billion--a far cry from the floor level of $23 billion required by the IMF, Thailand exited the IMF program in June 2000. The Thai economy grew by 4 percent in 1999. Repayments to the IMF will be made in eight equal amounts from 2000 to 2003. Over the last three years, Thailand's case can provide a good lesson for crisis-hit countries that have to depend on the IMF fund. The finding in this research can be summarized as follows.

The IMF conditionality implies a ceiling on domestic credit and a floor on the level of international reserves. To deny bailing out ailing financial institutions and printing money to finance public deficit, the central bank must establish its credibility and independence. Greater independence of the central bank, although does not guarantee price stability, would reduce the time inconsistency problem of monetary policy. Viewed in this light, the IMF conditionality on good governance, accountability, and transparency are highly desirable. Without pressure from external factors, development of institutional framework would come only gradually from internal initiatives. In addition, without stringent rules on accounting standard, timeliness of data, prudential banking rules and regulation, and overhauling of legal system regarding bankruptcy and foreclosure laws, sustainable recovery would be next to impossible.

In deep recessions, financial instability becomes apparent and pervasive as output declines. Financial crisis prolongs economic recession and prevents sustainable recovery. In times of prosperity, cyclical excess leads to financial fragility, as speculative finance become the predominant means of debt accumulation. Macroeconomic stability and financial instability are therefore incompatible, whereas boom-bust cycles and financial crises are intricately related. Implementation of measures to enhance stability of the financial system during the economic downturn, as imposed on Thailand by the IMF, must take in to account its macroeconomic impact that might further delay economic recovery.

In the short run, temporary capital controls are necessary to make monetary policy become effective and to prevent capital flight. Floating a currency in the period of speculative attacks is not recommended. In the longer run, when crisis of confidence is over, the country may gradually permit the exchange rate to be determined by

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* This report was completed in August 2000 as part of an ICSEAD's External Research Contract program for fiscal 1999. Financial support from ICSEAD is gracefully acknowledged.

market forces. And once the crisis-hit country has floated the currency, the central bank should not intervene to maintain or produce a certain level of the exchange rate.

After the crisis, overreaction was shown in the attempt to restore public and international confidence in the banking sector by raising the most stringent banking standard rules and regulation during the time when the weak economy badly need liquidity. Although, time inconsistency problem always remains in formulating monetary policy strategy, transparency and accountability should prevail. Thanks to the IMF for imposing conditions on the Bank of Thailand for releasing timely information on macroeconomic data on a regular basis.

A simple model is developed to show that a country might experience a severe contraction after devaluation. In an economy, where bank credit is the most important source of funds for investment and firms and banks' liabilities are dominated by unhedged dollar-denominated debt. If the rate of depreciation exceeds the threshold level that triggers technical bank failure, bank lending can contract. Shortages of loanable funds can also arise from redistributive effects of bank deposits withdrawals from aggressive to conservative banks. A Sharp decline in investment and durable consumption would follow. The 1998 recession in Thailand was considered here as evidence of a contractionary devaluation.

The IMF mission to Thailand underestimated the severity of the output contraction; therefore, they prescribed contractionary fiscal policy since they incorrectly anticipated a turnaround of the Thai economy in 1998. At the same time, they overestimated the inflation rate and the current account deficit. One cannot argue that the macroeconomic forecasting mechanism of the IMF has a serious flaw.

The IMF should place more emphasis on the prevention of the outbreak of the crisis. In particular, the pre-crisis policy prescriptions should involve providing instantaneous fund support for countries that suffer from currency attacks. Although the international bailout program may involve the issue of moral hazard, the damage from the moral hazard behavior of borrowing countries may be relatively small, comparing to the high cost of contagion effect. As long as there is a negative externality, the intervention by international lending agencies is justified. Furthermore, the moral hazard behavior can be discouraged by applying penalty rate of interest to countries in need of urgent fund. This recommendation does not suggest the IMF bail out of all countries that maintain unrealistic level of exchange rates. What is suggested is that such countries should be able to buy time to exit from the fixed exchange rate smoothly--not being forced to permit a free fall in the exchange rate. As evidence from Thailand in 1997 attested, the free fall of the baht created unnecessary collapses in other countries' exchange rates.

The IMF has regarded Thailand as a successful case for undergoing through structural adjustment programs with impressive recovery. Although there are heavy cost Thailand have to pay in terms of output loss, the impact of such reforms will be long lasting. In particular, the development of legal framework, governance, and institutional reforms would undobtedly create an efficient and sound financial system.

1. Introduction

It has been three years since the Thai baht was floated in July 1997. Thailand, among other troubled Asian countries, has embraced IMF's policy prescriptions in return for a rescued financial bailout of $17.2 billion. It was then expected that Thailand could solve its economic turmoil by currency devaluation, establishing prudential bank regulations, employing fiscal austerity programs, and tightening monetary policy. Thailand has strictly obeyed IMF conditionality. As it turns out, the immediate effect in 1998 was disastrous in terms of output loss and high unemployment, despite the fact that external balance was restored.

After witnessing a sharp economic downturn, the IMF has permitted Thailand to ease fiscal and monetary policy stance. Nonetheless, the high levels of non-performing loans and corporate foreign debts have aggravated the economic slump and prolonged recovery. The sharp turnaround from deficit to surplus in the current account was the result of import compression because of output contraction. In particular, imported raw materials dropped sharply, reflecting the reduction in industrial output. A plunge in private investment also reduced imported capital goods. While export volume increased considerably, total value of exports in dollar terms actually declined by 6 percent in 1998. The deterioration in the export prices deprived the chance of early recovery that could have come about through the gain in competitiveness after devaluation.

The IMF has been attacked for its handling of Asian countries in crises. Jeffrey Sachs (1998) argued that the crisis stemmed from a financial panic. The IMF provided emergency funds for Thailand so that Thai financial institutions can meet panicked bank runs. However, the closing down of a large number of finance companies also contributed to the stampede of withdrawals. The IMF's intervention confirmed international investors' rational panic that led to capital flight. Furthermore, McLeod (1998) has criticized the IMF's conventional policy prescriptions, which forces the bailout countries to adopt tight monetary and fiscal policies to correct their balance of payments deficit. Krugman and Taylor (1978) argued two decades ago that devaluation can be deflationary and it should be accompanied by raising domestic demand to prevent output contraction. In response to the IMF's criticism, Fischer (1998) explained that temporary high interest rates are required to prevent further depreciation caused by lower interest rates. Deeper devaluation would raise permanent burden of dollar-denominated debts, while the burdens imposed by interest rates are temporary. Recently, the baht has appreciated by 30 percent from its lowest level in January 1998, while the short-term interest rates have been reduced at the level below the Federal Funds rate. Inflation has been subdued, and the international reserves have been raised substantially above the level required by the IMF.

The main objective of this research is to evaluate the effectiveness of the IMF's conditionality in restoring Thailand's macroeconomic stability. The ultimate macroeconomic goals of both internal and external balances would be examined, in relation to the imposed conditions on the management of fiscal, monetary, and exchange rate policies, as well as the financial restructuring policy. Aside from evaluating those conditions imposed by the IMF, the proposed research also attempts to answer the following questions: Is it advisable to float the exchange rate during the

period of capital flight and large external short-term debts? Would contagion effect have been limited if Thailand had chosen to devalue instead of floating the baht? To what extent that the central bank should intervene in the foreign exchange market to prevent the appreciation of currency after the worst crisis of confidence was over? What kind of policy reforms should be undertaken during recession to ensure future financial stability and sustainable growth path?

The study focuses on the process of recovery, rather than examining the causes and consequences of the crisis. The macroeconomic aspects of the crisis can be found in Adams and Ichimura (1998). In this research project, policies for recovery are the main emphasis. The fiscal policy is analyzed by examining its ability to restore external equilibrium and to reduce social cost of the crisis. The effectiveness of tight monetary policy in stabilizing the exchange rate is explored together with its adverse impact on contraction in domestic absorption. The flexible exchange rate policy is evaluated in terms of its ability to increase export competitiveness and to provide cushioning mechanism against external shocks. It was no coincidence that Thailand's export shortfall in 1996 and 1997 occurred when Japan's growth rate of total imports fell sharply during the same period. The possibility of having an economic recovery via export growth can then be examined from the impacts of changes in the exchange rate and the world output. The role of capital control in enhancing the effectiveness of monetary policy is also discussed.

Since the structural problem in the financial sector has exacerbated recession and prolonged recovery, the evaluation of the IMF program must include an examination of its effectiveness in restructuring corporate debts and recapitalization of commercial banks. By examining the policy prescriptions contained in all letters of intent issued by the Thai government to the IMF. We can understand the shifts in policy stance and their rationale as the economy advanced from mild recession in 1997 into a deeper recession in 1998[1].

It is expected that, by examining Thailand's macroeconomic management under the IMF program, the research would shed light on appropriate IMF conditionality. The study will identify policy prescriptions for pre-crisis and post-crisis bailout programs of international organizations to prevent future contagion effect. The research would provide an argument for a strong support of the pre-crisis bailout program, as opposed to a post-crisis bailout, that can prevent a sharp fall in the exchange rate of a trouble economy. Some criteria must be established to avoid moral hazard and short-term capital flight. For the post-crisis bailout, appropriate policy prescriptions on fiscal and monetary policies are required to prevent a sharp contraction in output, massive unemployment, and deepening poverty.

The IMF has been widely criticized for imposing stringent conditions on member countries when they are in dire need for capital funds during the crisis of the balance of payments. Some argued that the IMF conditionality hampered rather than helped the economic recovery. The transparency of information on reserve positions justified the early withdrawals of capital from troubled countries like Thailand. The closure of

[1] Thailand's real GDP fell by 1.6 and 10 percent in 1997 and 1998, respectively.

ailing financial institutions led to panic and stampede of deposit withdrawals from the banking system. Thus the resulted financial crisis aggravated the currency crisis, obstructing early economic recovery. Others argued that forced privatization and foreign participation in local banking industry led to fire sales of national assets. The implementation of institution reforms, as required by the IMF, would be analyzed. This includes the restructuring of the Bank of Thailand, consolidation of commercial banks, and the enactment of bankruptcy and foreclosure laws

The focus of this paper is on the macroeconomic aspect of the IMF conditionality. It points out that unrealistic macroeconomic framework of the IMF can lead to unnecessarily severe recession. If the expectation of the economic activity is overestimated at the beginning of the bailout program, the long lag effect of monetary and fiscal policy can create economic slump. Furthermore, when households' consumption and private investment are highly sensitive to changes in current income, a small magnitude of the monetary and fiscal policy prescriptions can magnify the severity of the downturn.

The report contains four major chapters relating to individual policy recommendation of the IMF: monetary policy, exchange rate policy, fiscal policy, and financial restructuring policy. The final chapter examines the overall IMF policy package and their complementary roles, from which conclusions on optimum policy mix are drawn.

2. Macroeconomic Framework and IMF performance criteria

To understand the nature of business cycles in Thailand, characteristics of growth cycles between 1988 and 1998 are described in this section. The macroeconomic framework and the IMF performance criteria are examined. The relationship between monetary policy, output fluctuations and financial crisis are explained. The technique of vector autoregressions (VARs) is utilized to analyze the impact of the tight monetary policy, which aimed to stabilize the exchange rate.

2.1 Characteristics of Booms and Busts

The cyclical variations of the Thai economy during the last decade can be classified into three episodes: (1) the hyper growth period between 1988 and 1990, (2) the steady state growth path, from 1991 to 1995, and (3) the downturn and recession period between 1996 and 1998 (Table 1). Three years of the double-digit growth between 1998 and 1990 were the result of investment and consumption booms. During this period, the rate of contribution to GDP growth from capital accumulation was higher than that of the private consumption. The period of excessive growth rate was followed by a 5 year-span of stable growth path of 8 percent per annum from 1991 to 1995. Consumption booms became more preponderant in this period and in some years were stronger driving forces than investment expansion. Indeed, a stable and steady rise in income has raised the level of households' permanent income. When investment slowed down in 1996, consumption remained a positive contributor to output, dominating other components of aggregate demand.

Since investment collapsed in 1997 and 1998, the role of shock absorber played by consumption has been replaced by net exports. It is the consumption compression that led to a severe output contraction by almost 10 percent in 1998. Evidence in the US

also points out to the same conclusion. Blanchard (1993) provides evidence showing that negative consumption shocks, originated from a drop in consumer confidence, led to the US recession of 1990-91. In 1997, because of habit persistence, households tried to maintain their level of consumption, although their income growth rate declined. Consequently, the ratio of consumption to GDP rose from 54.4 percent in 1996 to 56 percent in 1997.

Nevertheless, in 1998, households revised downward their permanent income in fear of continued recession, reducing consumer spending accordingly. Because consumption share in GDP was higher than the investment share, a same percentage reduction investment would lead to a lower percentage contraction in GDP. Investment fell by 22 percent in 1998, while private consumption declined by 8.9 percent. But both consumption and investment collapses contributed to the same magnitude of output contraction.

It should be noted that, both in 1997 and 1998 import compression and export surges in terms of baht also helped cushion the impact of reduction in private spending. Furthermore, there is a clear negative correlation between the growth contribution from consumption and net exports. A high growth rate achieved by consumption booms is unlikely to be sustainable, because a consumption-driven economy has to rely on foreign borrowing. In sum the longer the duration of the booms that were driven by foreign borrowing the higher the foreign debt burdens and wider current account deficit.

The role of government spending seems unimportant as a shock absorber, judging from Table 1, although the figures reported there may somewhat underestimate the fiscal impact. Multiplier effects of expansionary fiscal policy and impact of automatic stabilizers have been subsumed into changes in private spending. In addition, ex ante balanced budget indirectly reduced the crowding out effect and kept inflation at bay.

Real output growth declined from double digit rates, during the boom in the period 1987-1990, to 8 percent in the second phase during the period 1991-1996, and sharply contracted at the trough of the cycle in 1998. Likewise, the monetary base decelerated from 18.2 percent at the peak of the cycle to 16 percent in the normal expansion phase and markedly declined to 4.2 percent between 1997 and 1999 (Table 2). On the other hand, the standard error of the growth rate increased steadily, indicating greater fluctuations during the economic downturn. The coefficient of variation of growth rate of the monetary base rose from 0.2 at the peak of the cycle to 1.99 at the trough. While the growth rate of the monetary base reduced precipitously, it also fluctuated widely. However, the velocity of the narrow money (M1) remained surprisingly stable around the magnitude of 10, with a considerable degree of stability. In effect, the variation in output should not stem from changes in the velocity of money. The sources of fluctuations must come from the monetary base and the money multiplier. Indeed, the money multiplier calculated from M1 exhibited a declining trend with increased variations, similar to the behavior of the monetary base. There are various possible explanations for the declining money multiplier. Financial instability, fear of bank runs, and contagious bank runs led the public to prefer holding cash to bank deposits. In time of financial distress, banks would require holding a larger amount of excess reserves to protect against any unexpected withdrawals of deposits. Tightening rules of loan-loss provisions also imposed

liquidity constraints on banks. As a result, it is not surprising that the money multiplier of narrow money declined during the period of financial turmoil. Thus we can conclude that shrinkage in the monetary base and money multiplier led to a decline in the nominal income, while increases in volatility of these monetary magnitudes led to fluctuations in the nominal income level.

The broad money supply (M2) expanded throughout the three growth episodes, as a result of rising demand for wealth accumulation. However, while the money multiplier (m2) has an increasing trend, the velocity (V2) of the broad money declined from 1.5 in the boom years to 1.04 during the recession. The rising trend of the broad money multiplier is consistent with the increased value of the credit multiplier from 6.8 to 12.4. As a result, bank credit expanded rapidly around 22 percent during the first two growth episodes and slowed down to 13 percent on the average during the third episode. Consequently, the ratio of bank credit to GDP rose concomitantly from 59 percent to 125 percent of GDP during the same corresponding periods.

Table 2 also shows the value of semi-credit elasticity of investment. The declining value of the elasticity indicates that investment responded less vigorously to changes in credit. This can be interpreted that the efficiency of credit diminished as capital stock rose or credit was allocated to finance purchasing consumption goods instead of investment goods. Nevertheless the quality of bank loan extension can be measured by the Incremental Capital Credit Ratio. An increase in the ICCR indicates an improvement in the efficiency of bank credit. From Table 2, there has been a drastic decline in the value of ICCR throughout the three growth episodes, suggesting diminishing quality of bank lending in terms of its contribution to capital stock accumulation.

2.2 The IMF Performance Criteria

The macroeconomic framework was described in Letters Of Intent (LOI) of the Thai government to be eligible for the $17. 2 billion Stand-by arrangement program of the IMF. Tight monetary policy was the policy stance through out the first year under the IMF program, from LOI (1) to LOI (3). The growth rate of reserve money was reduced from 12 percent in 1996 to only 4.7 percent in 1997. In 1998, the target growth of reserve money was reduced from 11 percent in LOI(1) to 6.6 percent in LOI(3). Thus monetary policy remained tight throughout the first half of 1998.

Figure 1 indicates that the short term interest rate (the interbank rate) went up above 20 percent in September 1997 and maintained at high levels until July 1998, when there had been a significant fall in the interest rates. The rational for this high interest rate policy is to fend off speculative attacks since Thailand had abandon the two-tier exchange rate system that preventing off-shore transactions of baht.

It should be noted that the exchange rate between baht and dollar depends very much on the yen-dollar exchange rate (Figure 1). As the dollar weakens against the yen, the baht would automatically appreciate against the dollar. On the other hand, when the dollar gains its strength against the yen, the baht would depreciate against the dollar. The appreciation of the baht against the dollar in 1998 was the result of depreciation of the dollar against the yen--not as much as the result of the high interest rate policy engineered by the Bank of Thailand. In addition, deviation from interest parity is not

unusual during the period of financial turmoil and uncertainties. One cannot protect the exchange rate with high interest rates, since anticipation of exchange rate devaluation increased compensation for higher risks.

Unlike the turbulent period between 1997 and 1998, when the dollar-yen exchange rate was volatile, in 1999, the dollar-yen exchange rate achieved a certain degree of stability. Consequently, the volatility of Asian currencies against the dollar was reduced substantially in 1999. The policy implication is that international organizations or the Group of G7 should coordinate their efforts to maintain stability of the exchange rate between the yen and the US dollar. In this way, the US and Japan can indirectly mitigate the currency crisis in developing countries. In effect, developing countries would not have to use restrictive monetary policy to defend its exchange rate. The long and variable lag effects of such tight monetary policy would be detrimental to their long-term development.

The duration of high interest rates which lasted more than one year increased financial distress and deterioration of firms' balance sheet and households' net worth. In addition to negative wealth effect of portfolio holders, households and firms would be subject to liquidity problems. Financial institutions were not willing to lend, due to increased probability of default of borrowers, while investors were not willing to borrow, due to increasing likelihood of financial distress.

Figure 2 illustrates the severity of monetary contraction. The Bank of Thailand had attempted to slowdown the economy since 1995 to prevent overheating. In consequence, bank credit, M2, and M1 showed a declining trend. Between 1997 and 1998, the real growth rate of these monetary aggregated declined sharply, registering negative growth rate for bank credit and M1. The collapse of confidence in banking system and check accounts was the main culprit. It has a repercussion in the real sector. As evident in Table 2, both private investment index and manufacturing production index show a dramatic decline with an increased degree of fluctuations.

In an attempt to restore the balance of payments position, the fiscal stance was contractionary in the first two Letters of Intent. The central government balance was set at 1 percent of GDP (Table 3). A series of budget cut was undertaken, together with increases in tax rates to produce the surplus budget in the fiscal year of 1998. The budget-spending cut led to economic downturn, further lowering the tax revenues (Figure 3). In the third LOI (February 1998), the government, realizing that the economic suffered from recession, changed the course of fiscal stance to expansionary policy. In the fourth LOI(June 1998), the deficit was targeted at 2.4 percent of GDP.

As shown in Table 3, the framework underestimated recession, overestimated inflation and current account deficit. Because recession was unforeseen, there would be no need for fiscal stimulus. Naturally, inflation rate was overestimated because of the unexpected wage and price reduction caused by economic slowdown and rising unemployment. Actual figures of monetary aggregates(M2A, reserve money) are much lower than the targets, indicating that the actual contraction of money supply was far more than intended. As a result, as evident in Table 2, the 1998 growth rates in real output, consumption, and investment were revised downward continuously in all Letters of Intent.

3. Monetary policy, output fluctuations, and financial crisis

In deep and severe cycles, the soundness of the financial system as a whole is threatened, unlike during the mild cycle, there is no system-wide financial crisis. Thus business cycles are related to financial crisis. Fluctuations in real output are mainly caused by large and volatile components of aggregate demand. In general, the ratio of consumption to income remains stable in the long run as consumers try to smoothen out their spending over their lifetime income. Nevertheless, once current income is affected in the way that it causes household to revise downward their permanent income, we can observe a sharp reduction in consumption. As Figure 3 shows, private consumption in Thailand and Republic of Korea declined sharply during the period of economic crisis. Countries that were relatively less affected by the crisis, such as the Philippines and Malaysia did not experience severe compression in private consumption. Figure 4 tells a similar story for the plunging private investment in crisis-hit countries. Troubled Asian countries experienced private investment collapses as a result of monetary contraction, among other factors such as crisis of confidence. It is argued here that monetary shocks are crucial factors determining the sharp reduction in private consumption and investment.

3.1 Cyclical variations and financial instability

In Thailand, from 1991 to 1995, both the monetary base and output exhibited a minimal deviation from trend values. This was a period of stable growth, when the Thai economy grew at a steady rate of around 8 percent. It was clear from Figure 5 that when the monetary base slightly dipped below its trend, the output growth rate also fell below its potential level, albeit at a larger drop. From 1995 to the beginning of 1997, the monetary base grew faster than its trend, causing manufacturing output to grow rapidly above its trend. Nevertheless, a nosedive in manufacturing output began in 1997. This episode of production slowdown corresponds to the period of monetary contraction, which began earnestly after the currency crisis in mid 1997. This is reminiscent of the failure of the Federal Reserve during the banking crisis and stock market crash in 1929. The Fed could have prevented the Great the Depression in the 1930s, had it provided liquidity to offset the reduction in the money multiplier and the money stock (Friedman and Schwartz, 1963).

As international reserves had increased rapidly since 1987, the ability of the central bank to control the size of the monetary base began to diminish. The ratio of net foreign assets to the monetary base increased significantly. But it fell sharply and fluctuated widely after 1997. As Kaminsky et al (1998) point out, the ratio of broad money to international reserves is one of the best leading indicators of currency crisis. The sharp decline in the ratio of net foreign assets (NFA) to the monetary base, as well as the increased value of the broad money multiplier (Table 3), implies a rapid increase in the ratio of M2 to NFA. This signal had started warning for a year before the problem of capital outflows became a full-blown currency crisis in July 1997. Incidentally, during the same corresponding period, the Bank of Thailand's credit extended to financial institutions increased considerably as the financial crisis deepened.

Both investment and consumption are procyclical. The correlation coefficient between the rate of change in investment and consumption is 0.89 during the period 1987-1998. As such, an accommodating monetary policy may lead to bubbles in asset prices. Unproductive leading occurred in both investment and consumption sectors. Over capacity as a result of over-investment and over-borrowing lead to a nationwide property glut.

3.2 Empirical Evidence of excess sensitivity: A VAR Model

The lack of accurate data on the unemployment rate in Thailand reflects the fact that unemployment had never been a problem for Thailand until the recent economic crisis. Unemployment is linked with output growth through Okun's law: The American economy loses 2.5 percent of output for each 1 percent that the unemployment rate exceeds the natural rate. In the Thai context, we can approximate the deviations from natural rate of unemployment by utilizing the deviation of output from its trend or potential output.

(4.1) $$(u/u^*)_t = f(\Delta \ln(Y/Y^*)_t \; ; \quad f' < 0$$

where u is unemployment rate, u* natural unemployment rate, Y output. Y* is potential output, which is growing at a steady growth rate.

It is hypothesized that a positive deviation from the potential output level causes a decline in the unemployment rate relative to the natural rate and vice versa.

If monetary shocks cause a temporary departure of unemployment from its natural lvel, output fluctuations around the trend of output can be explained by deviation of money supply from its trend growth path:

(4.2) $$\Delta \ln(Y/Y^*)_t = \sum_{i=1}^{n} \alpha_i \, \Delta \ln(B/B^*)_{t-i} \; ; \quad \sum \alpha_i > 0,$$

where B = monetary base. The superscript (*) indicates the trend values.

The lag impact of monetary policy is captured by the inclusion of past deviations from the trend growth rate of the monetary base. The employment of the monetary base as a measure of monetary aggregates in this model arises from the need to establish a link between output and the operating target of monetary policy. It should be noted, however, that the controllability of the monetary base is also an important issue. The conditions imposed by a fixed exchange rate regime imply that the control error can be a source of ineffectiveness of monetary policy. Inflation taxes through issuing seigniorage would interfere with the goal of price stability. More importantly, the injection of high-powered money to bail out individual financial institutions (with no penalty) would lead to excessive monetary expansion.

As argued by Solow (1997), an appropriate framework for analyzing short-run fluctuations must be aggregate demand components. In view of the hypothesis that the business cycle is caused by cyclical excess of aggregate demand components, such as investment (I/I*) and consumption (C/C*), we may rewrite (4.2) as

$$(4.3)\quad \Delta \ln(Y/Y^*)_t = \sum_{i=1}^{n} \alpha_i \, \Delta \ln(B/B^*)_{t-i} + \sum_{i=1}^{n} \beta_i \, \Delta \ln(I/I^*)_{t-i} + \sum_{i=1}^{n} \gamma_i \, \Delta \ln(C/C^*)_{t-i} + \varepsilon_t ,$$

where ε_t is a random variable, representing a disturbance term capturing all non-systematic impacts of unimportant factors affecting output deviations. Both government spending and net exports are not important factors contributing to growth.

Causation runs both ways in equation (4.3). Exuberance and perception of buoyant economy must affect booms in consumption and investment expenditures. Consumption expenditures are determined by permanent income, while investment depends on expected output. Permanent income and expected sales can be formulated by past values of output growth. Booms and busts in consumption and investment spending must arise from past deviations of output growth and from conditions in money markets. Therefore, cyclical variations in private investment can be expressed by

$$(4.4)\ \Delta \ln(I/I^*)_t = \sum_{i=1}^{n} \delta_i \, \Delta \ln(B/B^*)_{t-i} + \sum_{i=1}^{n} \mu_i \, \Delta \ln(Y/Y^*)_{t-i} + \sum_{i=1}^{n} \nu_i \, \Delta \ln(C/C^*)_{t-i} + \omega_t$$

Similarly, consumption booms, $\Delta \ln(C/C^*)$, can be determined by similar distributed lag structures governing investment booms.

We can expect that cyclical excess variables, expressed by growth deviations from the trend of real variables such as output, consumption, and investment, would exhibit co-movements in the long run. Furthermore, if the monetary factor is responsible for such deviations, then deviations of the monetary base from its trend value must also have a long run relationship with these cyclical excess variables.

To test whether these four variables are cointegrated, monthly data are employed from 1992:2 to 1999:6. Availability of high frequency data forces us to consider only a certain set of variables to test the hypothesis of the existence of long-run relationships. Manufacturing Production Index (MPI) is used to replace output (Y). Sales of department stores (SALE) are used as a proxy for private consumption. Private Investment Index (PII) is utilized as private investment expenditures. The cyclical variables are generated by logarithms of the ratio between actual and trend values.

Augmented Dickey-Fuller (ADF) test statistics were employed to ensure the use of a stationary time series. As can be seen from Table 4 on the level form, they exhibit a nonstationary pattern. The null hypothesis that the series contain unit roots cannot be rejected. However, the first-differenced series rejects the null hypothesis of nonstationarity at one-percent significant level. It should be noted that the first difference form of the cyclical excess variable has a meaningful interpretation. It shows the rate of change of the deviation from its trend. For example, an overheated economy can be captured by a positive value of $\Delta \ln(MPI/MPI^*)$. A severe monetary

contraction is represented by a negative value of Δ ln(Mbase/Mabase*), while a decline in consumption is indicated by a negative value of Δ ln(C/C*).

We can test the presence of a long-term relationship among the four variables. Table 5 shows the result of Johansen tests for cointegration. Panel A reports that both cyclical variations in the monetary base and output are conintegrated. Based on the likelihood ratio test, the hypothesis that there is no cointegration vector between the two variables can be rejected at one-percent significant level. When a four-dimension vector process is examined, the results reported in Panel B show that there are at least 3 cointegrating vectors at the 1 percent critical value.

Panel C reports cointegrating coefficients of the four-dimension vector process. After normalizing the coefficients, the resulting values of normalized coefficients yield an interpretation of the long-run elasticities. It shows that the rate of change in the monetary base exhibits a strong influence on output variations. Since the long-run elasticity of output deviations with respect to changes in the monetary base relative to its trend value was around 4.6, the finding confirms the earlier conjecture that monetary shocks can magnify adverse consequences on the real economy. The ease or tightness of monetary conditions has a stronger impact on output.

Consumption expenditures, measured by sales of department stores, respond vigorously to changes in output. This evidence supports the hypothesis of excess sensitivity of consumption to changes in income. Flavin (1985) found evidence supporting the hypothesis of excessive sensitivity that consumption systematically responds too much to current income. Increased income level helps to reduce liquidity constraints, permitting consumption to respond to changes in income. It is not surprising that consumption spending output growth, capital accumulation, and monetary aggregates are interrelated. Interestingly enough, the evidence in panel C also shows that excessive investment the past was related to current economic recession. The model does capture adverse impact of over-investment.

3.3 Criticism of the monetary policy prescriptions

Inappropriate monetary policy responses to balance of payments crisis can lead to a severe recession. The excess sensitivity of consumption and investment to changes in current income lead to a sharp decline in output. The crash landing could have been averted had the monetary been less tightened. Instead of employing a high interest rate policy at the initial stage of the crisis, temporary stringent capital controls are required to prevent capital flight. Furthermore, a deficit budget must increase to compensate private investment shocks caused by precipitous fall in the currency value. This is important for countries whose balance of payments difficulties do not stem from lack of fiscal discipline.

This paper finds evidence supporting the hypothesis that monetary shocks lead to fluctuations in output. Excessive acceleration and deceleration in monetary aggregates throw the economy out of the long-term growth path. Therefore, supply of monetary aggregates should grow at a steady rate, corresponding to the rate of growth of the quantity demanded from the long-run growth of the economy. In effect, monetary shocks such as a sudden loss of international reserves, massive and sudden inflows of foreign capital, abrupt changes in capital requirement of the financial institutions, can

create substantial changes in monetary aggregates. A slight deviation from trend in the monetary base can magnify the impact of changes in the monetary base into virulent fluctuations in output and employment. Since real output fluctuates around a rising trend in a growing economy, stable and conservative monetary policy can keep the fluctuations around trend and should be employed to minimize its deviation.

The empirical evidence in this paper illustrates that there exist long run relationships between aberrations in monetary aggregates and cyclical fluctuations in manufacturing output, consumption, and investment. Inasmuch as there was a sharp reduction in investment, consumption compression was an important factor causing a collapse of the Thai economy in 1998. Cyclical excess in consumption and investment led to economic booms and busts. The evidence of excess sensitivity in consumption is found. An increase in income level gives rise to a relaxation of liquidity constraint, allowing households to borrow excessively to finance current consumption. Interestingly enough, both investment and consumption expenditures exhibit high degree of excess sensitivity to cyclical movements in output.

In hindsight, it seems that reactions of monetary authorities in the past were too late and too little to cope with currency and financial crises. Nevertheless, overreactions can also cause damages, in particular, when the predictive capacity of the future event is limited. According to the *Brainard conservatism principle*, coined by Blinder (1997), under uncertainty of various multipliers, monetary and fiscal policy should be more conservative. Policy prescription parameters should be moved in the same direction as optimal policy under certainty equivalence, but by smaller magnitudes under changing values of multipliers.

Monetary authorities must try to avoid large swings in the monetary base. Thanks to a flexible exchange rate system, the monetary base is not subject to any attempt to peg the exchange rate. The ability to control money supply of the central bank will be enhanced. The intervention in the foreign exchange market should be kept at minimum or not at all. In addition, the absence of inflation tax and financial bailout would ensure that the central bank could manage the monetary base to pursue price stability without any constraints that used to hinder the effectiveness of monetary policy.

4. Exchange Rate Policy

Exchange rate overvaluation is considered as a cause of Asian economic meltdown. In particular, countries that tied exchange rates closely with the US dollar and could not control inflation would experience widening account deficits. The contagion effect of Asian financial turmoil has created contraction in output level and generated high unemployment. Currency collapses and banking failures are intertwined in this episode of Asian economic meltdown. This section of the research paper suggests that for some countries that accumulated external debts denominated in the dollar, the collapses of firms and financial institutions were triggered by massive currency depreciation, leading to bank panics and financial disintermediation, which was followed by a severe output contraction. The theoretical underpinning of the contractionary effects of devaluation is presented, followed by the empirical evidence supporting the theoretical argument. The impact of currency depreciation on restoring the external balance is discussed.

4.1 Contractionary effects of devaluation

How can devaluation possibly be deflationary? If devaluation can improve the trade balance, other things being equal, then devaluation should be expansionary. Nevertheless, other things do change after devaluation. Governments' stability and their policy credibility can be eroded. Absorption level can be changed due to changes in consumers' expectations. The real quantity of money and credit can be affected by changes in the price level. Consequently, consumption expenditure can be reduced; private investment can decline; and public savings may be enhanced. These scenarios prevent devaluation from being expansionary.

In the short run, when quantities of exports and imports have not yet responded to devaluation, the existing trade deficit becomes larger in domestic currency because the value of trade balance is measured in higher domestic prices of dollar. Hirschman (1949) was the first one who raised this plausible source of income contraction after devaluation. The larger the initial trade deficit, the greater the contraction in national income. Furthermore, Diaz-Alejandro (1963) cited an example of Argentine contractioanry devaluation in 1959, in which devaluation redistributed income from workers to landowners. Since the propensity to spend of workers was higher than that of the landowners', aggregate consumption expenditure and output declined because of the distributive effect of devaluation. Krugman and Taylor (1978) argued that contractionary effect of devaluation would stem from enlarged budget surplus, because the public sector has lower propensity to spend than the private sector. Devaluation would raise trade tax revenues, while the government may have difficulty spending the increased revenue. Furthermore, as pointed out by Cooper (1971), the possibility of a decline in business activity after devaluation arises because of the rise in the domestic cost of servicing external debt denominated in foreign currency.

Since macroeconomic disequilibria became larger if a country postponed devaluation, it would require larger degree of demand contraction to correct balance of payments deficit (Edwards and Montiel, 1989). The long battle between Asian central banks and speculators and hedge funds was tantamount to causing disequilibria to deepen, thereby raising future adjustment costs. Nonetheless, output contraction might have stemmed also from the restrictive monetary policy applied prior to currency depreciation, since monetary policy has a long lag effect. In a simulated global CGE model, Noland, Liu, Robinson, and Wang (1998) found that devaluation in Asian countries increased net exports. Furthermore, these troubled Asian countries would suffer from a large fall in domestic absorption[2]. The macro closure of the model forces a proportional adjustment in each component of absorption and let domestic savings adjust endogenously. In other words, the contraction in domestic absorption is a natural consequence of the improvement of the current account.

There is a distinct possibility that a large depreciation can result in the contraction of output rather than spurring the economy out of a recession. If a country has accumulated large unhedged foreign debts, a small rate of currency depreciation can push an economy into a recession, because banks' aggressive behavior and financial

[2] However, the deflationary impact of the crisis in this model does not arise from the monetary sector, which is absent in the model.

liberalisation with inadequate bank supervision can reduce the threshold level of depreciation.

With over-borrowing in foreign currency, a complete halt in intermediary functioning of the financial sector can take place. The net worth of banks can easily be negative if their foreign borrowing is high relative to their equity. The balance sheet effect would discourage banks to continue lending to their customers and may recall their loans and stop rolling over their existing credit lines. In addition, incentives and profitability of bank lending would be reduced. Large corporations that previously issued dollar-denominated convertible debentures have suffered from rising debt burden, when the currency plunges further. In light of rising level of debt accumulated by these firms, commercial banks would be unwilling to extend more loan. Moreover, with falling values of collateral, banks would have no choice but curtailing their outstanding loans. It is unrealistic to expect banks to increase their lending activity during the downturn.

According to Irving Fisher (1939), financial factors were major sources and propagators of decline during the Great Depression. Debt disturbances and price level disturbances are two major causes of booms and depressions. Over-indebtedness is responsible for over-investment and over-speculation. Financial collapses in developing countries after currency crisis have caused recessions in troubled Asian countries that would be followed by price deflation. Devaluation trigger over-indebtedness in foreign debt in local currency and set up serious disturbances in all other economic variables.

Debt overhang in the private sector also reduces its willingness to borrow to expand their business. The private sector is having difficulty servicing its debt due to rising interest cost. As price declines during recession, the reverse Pigou effect on liability, instead of working on the wealth effect, would further reduce private consumption and firms' capital spending. While literature on contractionary devaluation ignores the financial sector's foreign debt problem, debt deflation literature also disregards the impact of devaluation on debt in terms of local currencies.

Bank credit or money supply can be regarded as an inseparable input in the production function. With a dysfunctional financial system, lack of credit, and a reduction in money supply, industrial output can be adversely affected. In particular, small and medium sized firms, which are labour intensive and depend more on bank credit than large industrial firms, would be more severely affected by not being able to access credit markets.

There is another possibility that aggregate bank credit can be reduced after depreciation. Some banks, which are aggressive than the others, would tend to source their funds from borrowing abroad. These aggressive banks also have higher marginal propensity to lend from their disposable deposits than conservative banks. As the value of domestic currency declines further, these aggressive banks become unstable because the value of their net worth also decline with the rate of currency depreciation. When these aggressive banks are nearly technically bankrupt, they would also experience bank runs. A reallocation of deposits will take place, thereby shifting loanable funds from aggressive banks to conservative banks, which have lower marginal propensity to lend. In the end, the total volume of bank credit would decline because of the reallocation of deposits. Moreover, conservative banks

themselves would become more cautious in lending and would retain higher excess reserves, in anticipation of unexpected withdrawals during financial crisis.

Because of credit contraction, interest rates rise after devaluation. In addition, the rising price level caused by the depreciation of the exchange rate reduces the real quantity of money. Both the increase in the cost of capital and the reduction in credit availability translate into a slowdown in investment expenditures.

The relationship between the depreciation of the exchange rate and the growth rate of output can exhibit non-linearity. At a small rate of currency depreciation, domestic demand and exports can be stimulated, as long as the depreciation has not reached the threshold level that triggers financial disintermediation. As the exchange rate depreciates further below the critical level, the contraction in output would be inevitable.

4.2 A model of bank failure and credit crunch

In this section, a simple model is developed to illustrate that devaluation may be deflationary. The source of deflation comes from the destruction of financial intermediary role of commercial banks. Instead of relying on differences in propensity to consume of different classes of consumers, the redistibutive effect of devaluation can arise from different propensities to lend of different types of commercial banks. To relate the impact of changes in credit to domestic absorption, a standard stock adjustment model of investment with a variable speed of adjustment can be employed.

4.2.1 Redistributive effect of bank deposit withdrawals

Assuming that there are two types of commercial banks: (1) conservative banks which depend less on foreign borrowing and tend to rely more on deposits as a source of loanable funds, and (2) aggressive banks, which have higher ratio of foreign liabilities to equity than conservative banks. Suppose both banks in the short run do not engage in raising capital funds, the supply of loanable funds of aggressive banks can be represented by

For conservative banks, whose sources of funds are assumed to come from deposits only,

$$\Delta L^c = (1-\chi)\Delta D^c \tag{2}$$

where χ is the total (required and excess) reserve ratio of conservative banks.

The net worth of commercial banks is the difference between their assets (loans net of bad debts) and liabilities, which are deposits and foreign borrowing in domestic currency.

(3) $NW = L - D - e.F^{\$}$

where NW represents net worth, e the foreign exchange rate,

and $F^{\$}$ the stock of foreign borrowing.
Let $D = \theta L,\ L = \gamma E,$ where θ is deposit - loan ratio, γ is loan - equity ratio.

We can express banks' net worth as

(3') $NW = (1-\theta)(1-\phi)\gamma E - e.F^{\$}$

where ϕ is the bad - debt written - off ratio from the equity.

Banks are technically bankrupt when $NW \leq 0$.
Define the threshold level of the exchange rate that causes technical bankruptcy as

(4) $e^* = \gamma(1-\phi)(1-\theta)(E / F^{\$})$

Let v be the ratio of net foreign liability to equity,

(5) $v = eF^{\$} / E; \quad v < 1.$

Banks cannot sustain the rate of currency depreciation if it exceeds the threshold level of depreciation:

(6) $d^* = (e^* - e) / e = (1-\theta)(1-\phi)(\gamma / v) - 1$

The threshold rate of currency depreciation is increasing in the loan to equitiy ratio (γ), and decresing in deposit to loan ratio (θ), non - performing loans ratio (ϕ), and the ratio of banks' foreign borrowing to equity (v).

The banking system becomes more vulnerable to exchange rate depreciation if it cannot generate high quality earning assets relative to its deposits and capital funds. High level of bad debt will weaken the ability of banks to withstand a fall in currency value. The loan-equity-ratio indicates the efficiency of banks, since implies the ability of banks to create earning assets from a given level of capital funds. This parameter also has its maximum value determined by the capital adequacy ratio imposed by law. The capital control relaxation permits an increase in the net foreign liability to equity, thereby making the banking system become more vulnerable to exchange rate shocks.

Premature capital control relaxation through raising the net foreign liability positions of banks would lower the critical rate of currency depreciation that undermines banks'

net worth. On the other hand, inadequate supervision can lead to poor quality of lending, which increases the vulnerability of banks to be able to withstand currency depreciation. In the medium term, aggressive lending would not pay off if leads to substandard loans and doubtful debts after currency depreciation.

If the rate of currency depreciation approaches the critical rate, the probability of bankruptcy for aggressive banks will be rising. The larger the rate of currency depreciation, the faster the probability of bankruptcy for aggressive banks approaches unity. The expected return from deposits at aggressive banks would be negative, because of the high probability that depositors would lose both principal and interests. Deposit runs take place from aggressive banks to conservative banks, some of which are branches of foreign banks. We assume that conservative banks do not borrow in foreign currencies.

Assume further that all withdrawals from aggressive banks run to conservative banks,

then $\Delta D^c = -\Delta D^a$,

(7) $$\Delta L = \Delta L^a + \Delta L^c = (\alpha - \chi)\Delta D^c + (1 - \omega)\Delta F$$

Total amount of loanable funds for the whole economy would decline since the marginal propensity to lend of conservative banks is lower than aggressive banks.

The impact of currency devaluation on the level of loanable funds can be evaluated from the following expression:

(8) $$\Delta L / \Delta e = (\alpha - \chi)\Delta D^c / \Delta e + (1 - \omega)\Delta F / \Delta e$$

Since $\Delta D^a / \Delta e < 0$ as $e \rightarrow e^*$, and $\Delta F / \Delta e < 0$ because of capital flight after

massive devaluation, $\Delta L / \Delta e < 0$.

The supply of loanable funds can be reduced after a large depreciation, even without capital flight, as long as there are bank runs from domestic (aggressive) to foreign (conservative) banks. Thus, after large currency depreciation, there is a possibility of a contraction in credit because of redistributive effects of loanable funds from aggressive banks to conservative banks.

4.2.2 The balance sheet channel

One of the monetary policy transmission mechanism, aside from interest rate channel, is the balance sheet channel (Mishkin, 1995). Bank credit expansion depends on the size of disposable or loanable funds, and the rate of return from lending. The lending

interest rate net of expected credit risks determines the share of banks' lending in their total assets. For simplicity, we rule out bank runs and concentrate on the amount of loanable funds that come from changes in foreign borrowing and net worth.

(9) $$\Delta B = \beta \Delta L = \beta[(1-\omega)\Delta F + \Delta NW]$$

where B is bank loans, β represents a variable lending coefficient.

In effect, we are assuming that lending volume is homogeneous degree one in the size of total assets or loanable funds. The share of total assets allocated to loans depends on the lending interest rate and the default risks, which can be proxied by the foreign leverage ratio of banks' customers.

(10) $$\beta = \beta_1 r + \beta_2 \phi = \beta_1 r + \beta_2 e(F^{\$} / E)^c; \qquad \beta_2 < 0.$$

where ϕ indicates default risks proxied by foreign leverage ratio of banks' customers.

(11) $$\beta = \beta_1 r + \beta_2 e.\ell$$

where $\ell = (F^{\$} / E)^c$
An increase in bank lending is represented by

(12) $$b = \Delta B = (\beta_1 r + \beta_2 e.\ell)[(1-\omega)(e\Delta F^{\$} + F^{\$}\Delta e) + \Delta NW]$$

At a small rate of depreciation below the threshold level, banks are induced to borrow from abroad, while the marginal burden of outstanding foreign liabilities can be fully offset by a reduction in net worth. Thus, the impact of a change in the exchange rate can be examined from (13):

(13) $$\partial b / \partial e = (1-\omega)\Delta F^{\$}(\beta_1 r + 2\beta_2 e.\ell)$$

Define $J \equiv (1-\omega)\Delta F^{\$} > 0,$ which can be thought of as capial injection through

share acquisition from abroad or public bailout to restore the level of equity.

(13') $$\partial b / \partial e = J(\beta_1 r + 2\beta_2 e.\ell),$$

Note that bank credit, despite fresh capital fund injection, can expand or contract after currency depreciation. The determining parameters are capital control variable, the lending interest rate, and the foreign leverage level of banks' customers. If a country liberalises its capital account and maintains higher interest rates, it is likely that at the

initial state of currency depreciation, the impact on bank credit would be expansionary. Unless the foreign leverage ratio of corporations is very high or banks have a strong degree of credit risk aversion, bank credit can expand as long as business firms are not adversely affected by the depreciation.
From (13'), we obtain the level of the exchange rate that can trigger bank credit contraction.

(14) $$\tilde{e} = (r\beta_1) / (2\beta_2 \ell)$$

where $\tilde{e}$ is the threshold exchange rate.
The threshold exchange rate is increasing in the domestic lending interest rate and decreasing in firms' ratio of foreign leverage. As the value of domestic currency plunges further, bank credit can actually contract, because

(15) $$\partial^2 b / \partial e^2 = 2J\beta_2 \ell \quad < 0.$$

According to the bank lending view, the reduction in bank credit supply forces investors to reduce real spending because alternative means of funding are unavailable or unaffordable, in particular investment of small manufacturing firms (Bernanke, Gertler, and Gilchrist, 1996). We may hypothesize that, according to the variable stock adjustment model of investment, the availability of bank credit can increase the speed of adjustment between actual and desired level of capital stocks.

(16) $$\Delta K_t = \mu(K_t^* - K_{t-1})$$

where μ is the speed of adjustment.

(17) $$K_t^* = \kappa_1 Q_t^e + \kappa_2 r; \qquad \kappa_1 > 0, \kappa_2 < 0.$$

where K_t^* is the desired level of capital stock, Q_t^e is the expected output.
The speed of adjustment is positively related to the amount of credit expanded relative to the gap between the desired and existing level of capital stock

(18) $$\mu = \mu_0 + \mu_1 [b / (K_t^* - K_{t-1})]$$

If depreciation is a fraction δ of the existing capial stock,

with some manipulation, we obtain the expression for gross investment:

(19) $$I_t = \mu_0 \kappa_1 Q_t^e + \mu_0 \kappa_2 r + \mu_1 b + (\delta - 1) K_{t-1}.$$

The level of expected output, the rate of interest, the new volume of bank credit, and the existing level of capital stock determine gross investment.

The impact of exchange rate depreciation depends on its impact on the expected output, the level of the interest rate, and the expansion in bank credit.

(20) $$\partial I / \partial e = \mu_0 \kappa_1 [\ \partial Q^e / \partial e] + \mu_0 \kappa_2 [\ \partial r / \partial e] + \mu_1 [\ \partial b / \partial e]$$

If $e > \tilde{e}$, $[\ \partial Q^e / \partial e] < 0$, $[\ \partial r / \partial e] > 0$, $[\ \partial b / \partial e] < 0$.

If the currency is overshooting above the threshold level, contractionary impact of devaluation on investment can occur, since

(21) $$\partial I / \partial e < 0$$

Investment can be reduced when the depreciation of the domestic currency has the following effects: (1) it causes pessimism on future output; (2) it raises the domestic interest rate (interest rate parity condition); and (3) it reduces the volume of bank lending.

If durable consumer goods can be thought of as capital goods, the ability to purchase these products would be reduced by credit contraction. In effect, domestic absorption, through reduction in investment and consumption of durable goods, can also be dramatically curtailed after a large devaluation. If currency depreciation can reduce the investment-saving gap, current account deficit can be improved significantly. Moreover, household savings can be raised in response to uncertainties, while durable consumption expenditure can be cut as a means to restore liquidity (Mishkin, 1976). It is therefore not surprising that there was a turnaround in current account position from deficit into surplus.

If exporters require bank credit to facilitate their production of export commodities and their shipment, the reduction of bank lending can also retard exports despite the fact that export supply price elasticity is high. The higher prices of exports in domestic currency would not necessarily translate into higher export earning, if exporters are constrained by liquidity shortage. Specific credit arrangement to support exporters must be in place to take the full benefit from competitive gained through depreciation.

4.3 An appraisal of Thailand's exchange rate policy after the crisis

Figure 1 illustrates the dept of the baht depreciation after the float. As the Korean won and the Rupeah were breaking the new low at the beginning of the year 1998, the baht was also dragged down. The growing pessimism become widespread and capital outflows continue. Banks became hesitant to lend and were more worried about their non-performing loans. The aggressive Thai banks as well as their large clients borrowed substantial amount of unhedged loans from abroad.

A surge in capital inflows to Thailand began in the late 1980s and continued unabated until 1996. The flows brought along rapid economic growth and the balance of payments surplus. By 1995 the Bank of Thailand realized the adverse consequences of short-term capital flows and began tightening monetary policy instruments. The Bank of Thailand tried to address the problem of widening current account deficit and overheating economy in a series of measures. A maximum loan-deposit ratio was set at 1.17, while the maximum rate of credit expansion was set at 24 percent in 1995. This ceiling was subsequently reduced to 21 percent in the following year. In August 1995, commercial banks were required to hold reserves of 7 percent of their short-term non-resident baht deposits. In June 1996, all financial institutions were required to hold reserves of 7 percent from *new* short-term foreign borrowing. These were examples of various measures that the Bank of Thailand employed to discourage short-term flows. As Figure 2 illustrates, all three measures of monetary aggregates decelerated significantly in 1996. The restrictive monetary policy was able to slow an economic expansion down to 6.4 percent in 1996. In hindsight, these tightening measures were undoubtedly belated and inadequate to deal with volatile capital flows.

Notwithstanding the restrictive monetary measures imposed by the Bank of Thailand, bank credit expanded unabatedly in 1997 despite a sharp decline in both M1 and M2. In 1997, series of bank runs and the collapses of 56 finance companies seriously damaged the stability of financial institutions in Thailand. By 1998, the severe contraction in the financial sector was evident in the reduction in real bank credit and M1. The growth rate of real M2 is positive in 1997 in response to high interest rates and rising demand for precautionary savings during the period of uncertainty. A sharp fall in the velocity of money indicates a severe degree of economic recession.

As interest rates rise together with anticipation of economic recession, the SET index fell from 1360 points in 1994 to its lowest level of 207 points in early September 1998. Consequently, the value of Thailand's capital market in 1997 has vanished by 70 percent of GDP since 1995. Massive devaluation of the baht resulted in poor performance of firms listed in the stock market, since a large number of them also borrowed from overseas and imported capital goods through foreign trade credit.

In 1997, an unprecedented capital flight from the non-resident baht accounts amounted to $5.7 billion. These were the local banks' deposits, which were counterpart funds from foreign portfolio investment. From January to July 1998, capital flight through non-resident baht accounts reached $6 billion. The evidence suggests that far from inducing capital inflows, overshooting depreciation has encouraged capital flight (Figure 6). As mentioned earlier, the depressed stock market led to a substitution effect of assets in the portfolio of the private sector. The flows of new savings will be allocated to lower risks assets such as bank deposits. Thus, we can observe a rise in deposits at banks to secure a larger nominal return from fixed deposit rates as high as 16 percent. The portfolio reshuffle from shares in the stock market to bank deposits occurred after the government announced its guarantee over deposits of all nationalized commercial banks.

The negative wealth effect from the stock market crash and growing pessimism of the economy has led to a continuing decline in consumption expenditure from 1997 to 1998. It is evident in declining private consumption. As expected sales decline, it is not surprising to see a reduction in fixed capital formation of the business sector.

Because the largest component of GDP is consumption expenditure, a continued reduction in consumption expenditure has become a major cause of recession. As household savings increase, there would be no doubt that the current account deficit can be improved accordingly through narrowing investment-saving gap. As such, we have observed the turnaround in the current account position into surplus as early as the fourth quarter of 1997 (Figure 6).

When the baht exchange rate hit its lowest point in January 1998, interest rates had already been rising since the July float. Due to high lending interest rates, bank credit can still expand rapidly in real terms. In addition, because of some lag adjustments, bank credit still expanded rapidly during the period in which prospects of recovery were not overwhelmed by pessimism. However, the deep sinking value of baht has changed all that. Bank credit began to shrink rapidly as banks were aware of future large non-performing loans. The newly imposed financial regulations that require banks to increase capital funds and reserves for doubtful debts also caused banks to scale down their lending activity.

Private investment index took a sharp decline as bank credit growth contracted. One year after the float, the real volume of credit was actually reduced. Firms need working capital for their operation and require additional credit to finance their acquisition of capital goods. This is also true for export companies, which receive overseas orders but cannot produce their commodities due to lack of liquidity. In time of credit crunch, even if the export prices were attractive, firms would have difficulty obtaining credit to secure imported raw materials for their production. In this sense, devaluation might not help spur exports. The decision to purchase consumer durable goods is affected by credit availability and rising lending interest rates. Liquidity shortage and high repurchase cost have contributed to a sharp decline in durable consumption expenditure. The sales of department stores continued to decline in both 1977 and 1998.

4.4 Should the IMF always impose currency devaluation?

The implication of the old debate concerning the elasticity pessimism is quite clear. The impact of currency devaluation on trade balance depends on both substitution and income effects. Monetary factor and domestic absorption must also be included in the analysis.

As shown in Figure 7, the rate of growth of Thailand's imports declined throughout 1996, indicating a slowdown in economic activity. On the other hand, exports though slowed down in the first three quarter of 1996, it was on the upward trend in the first half of 1997. After the float in the second half of 1997, there was a steep increase in export values in baht, reaching the peak in the first quarter of 1998, when the baht also hit the lowest historic level. These values of exports and imports are in baht terms. Then came 1998 as the baht regained its strength, the steamy explosive export growth simply disappeared. The movement of imports followed the exports closely. In 1999, when the exchange rate was stabilized and the output started to recover from the recession, the growth of imports, once again, outstripped the exports', suggesting that the trade surplus is shrinking as expansion of domestic output requires imported raw materials and capital goods.

It is emphasized here that the price effects from currency movement are not as strong as the output effects stemming from movements in domestic and foreign income. Figure 8 supports this point. A dismal fall of the 1998 Thailand's exports coincided with the fall in world output (proxied by the weighted averaged betweeen the US and Japanese output). In 1999, despite the appreciation of the baht, exports grew rapidly as the result of the strong output growth in the US. There seems to be a very close correlation between Thailand's export performance and world economic expansion. Nevertheless, there were some exceptions in 1988, 1991, and 1995 (Figure 8). Nevertheless a negative movement of exports which is inconsistent with world output growth rate would require a larger than normal adjustment the true relationship in the year following the abnormal movement. Thus we saw a jump in exports in 1984, a sharp decline in 1992 and 1996. It is argued here that there is a long run relationship between Thailand's export performance and the output growth rate of Japan and USA. The implication is that exchange rate adjustment may not bring about a long run external equilibrium adjustment as fast as the output adjustment. The policy implication of this finding is clear. Both Japan and USA can indirectly help troubled countries by expanding their economy.

4.5 Concluding remarks on the exchange rate policy prescription

This section of the research paper argues that the decision to float the baht may not be the best solution to deal with the crisis. An alternative means was to devalue by a certain percentage—the rate that was anticipated by the market. With the benefit of hindsight, if Thailand had chosen to devalue the baht by a moderate level, adverse consequences and contagion effects might have been mitigated. Floating the exchange rate has deprived the country of a nominal anchor and caused the exchange rate to drift far apart from its economic fundamentals in the short run. This is not to argue against a flexible exchange rate regime, which has its own merit in cushioning an economy from external shocks. The act of floating the exchange rate itself can be considered as an external shock to the domestic economy. What is needed is a transitional period between the fixed exchange rate and the floating rate. An adjustable peg system of a basket of currencies may be appropriate in preparing the private sector to adjust itself with rising foreign exchange risks. Floating a currency during the period of financial crisis can have a devastating effect on output.

There exists a possibility of contractionary impact of massive devaluation. The empirical demonstration of this statement is shown in Figure 9. It is obvious that there was a negative relation ship between the rate of changes in the exchange rate and the industrial output, represented by manufacturing production index (MPI)[3]. As the value of the baht plunged further in 1998, the degree of output contraction was rising. Note the lagged effect on the output decline, despite the regained strength of the baht in the late 1998.

By 1999, manufacturing output registered a positive growth rate on the year-on-year basis, when the baht-dollar exchange rate achieved stability. Weak currency does not always stimulate employment. In particular, when the banking system has relied heavily on foreign borrowing to excessively finance domestic investment. Furthermore, the existence of a large volume of domestic debt would prolong the

[3] The correlation coefficient is -0.64.

recovery, as the real value of debt of the private sector would be rising after asset price deflation. The so-called debt-deflation process was operating in 1998. Commercial banks are not willing to lend since the values of collateral have declined sharply, resulting in the contraction of firms' working capital. Large corporations with high leverage, in particular firms that have issued debt instruments in foreign currencies, are not able to service their debt after the unprecedented fall of the baht. Banks have become more cautious by reducing their credit risk exposure and try to rebuild their equity capital. Small and medium-sized firms have difficulty finding alternative sources of funds. The resulted financial disintermediation process has adverse impact on output.

We have observed a large contraction in monetary aggregates in Thailand. Although the baht rebounded from its lowest level in January 1998 by 30 percent, the adverse impact of devaluation was partially mitigated. The policy implication of this research reinforces the argument made earlier by Krugman and Taylor (1978) that when devaluation combined with tax increases, it would aggravate deflation. In the situation described earlier, devaluation should be accompanied by policy measures to increase aggregate demand. This research also provides an argument for a strong support of the pre-crisis bailout program, as opposed to a post-crisis bailout, that prevents a sharp fall in the exchange rate of a troubled economy facing speculative attacks. The IMF can intervene by providing international liquidity to troubled countries so that they can exit the fixed exchange rate smoothly through step-by-step devaluation. Otherwise, crisis-hit countries can choose temporary capital controls.

Capital control relaxation undertaken when prudential rules and bank supervision are not strengthened can prove to be disastrous; the experience to which Thailand can attest. Similarly, floating the exchange rate during capital flight with the absence of policy credibility can push the exchange rate below the threshold level that would trigger financial instability. The higher the level of uncovered foreign debts, the lower the level of the threshold exchange rate. Thus floating the baht in July 1997 can easily trigger both financial panics and exchange rate crisis, followed by a deep recession.

5 Fiscal Policy Appraisal

As consumption expenditure declines, value added tax revenues also fall short of expectation. Tax revenues were raised temporary in December 1997, partly due to an increase of the value added tax rate from 7 to 10 percent, as required by the IMF bailout package. The severity of the recession in Thailand can be gauged from a continued decline in revenues since January 1998 (Figure 10). As such, we can rule out the possibility of contrationary devaluation that stems from fiscal surplus effect as envisaged by Krugman and Taylor (1978). Public spending continued to decline below the previous year level because of austerity measures imposed by the IMF. The planned 982 billion baht fiscal budget for 1998 had been cut three times to produce the surplus level stipulated by the IMF conditionality of one-percent of GDP. The actual spending for fiscal 1998 was 836 billion baht—almost a 15 percent reduction in public spending. In the end, the 1988 actual fiscal deficit was 3 percent of GDP, just under the 117 billion baht set by the IMF in subsequent relaxation of fiscal austerity

program. A larger level of deficit could have prevented severe output contraction in 1998, without producing adverse impact on external balance.

According to the National Statistical Office's survey, the per capita income of households declined sharply after the crisis in 1998 (Table 6). As per capital income rose in 1996, the average propensity to consume fell in all regions. However, when income contracted in 1998, the average propensity to consume continued falling. Figures in Table 6 imply that the Thai reduced their consumption expenditures more proportionately than the fall in their income levels. In addition, although they cut down their consumption considerably, their debt per capita also rose. This is why expenditures for social safety net are important to alleviate the burden of the macroeconomic adjustment[4]. In a letter of Intent in May 1998, the government allocated additional 0.5 percent of GDP in the budget for implementing concrete measures to strengthening the social safety net.

The policy to stimulate growth is probably the best way to reduce the number of people living below poverty level. Dollar and Kraay (2000) analyzed data from 80 countries over four decades and found evidence suggesting that growth helps the poor and growth is not biased in favor of the rich. On the other hand, income distribution can be biased toward the poor if the government can reduce inflation and reduce public spending. If the IMF policy recommendation can spur growth, the problem of poverty alleviation and income distribution can be reduced.

Early in the economic crisis in 1997, the Thai government introduced measures to induce private investment by providing short-term investment incentives The temporary tax exemption covers imported machinery to produce export goods such as textile, footwear, food and other manufactures that export at least 80 percent of their products. Other 19 supporting industries are also granted eight-year exemption from corporate tax. Foreigners are allowed majority stakes or full ownership of promoted project serving domestic markets. Foreign direct investment in 1998 actually increased above the pre-crisis level.

Table 7 illustrates how the structure of fiscal budget was altered after the crisis. In an effort to cut the spending, the public spending was cut almost 4 percent in 1998, compared with an increase of 7 percent in 1997. The deep cut was in the capital expenditure, declining by 20 percent in 1998, compared with the increase of over 10 percent in 1997. The interest payment has become an important item in the 1999 budget. The current expenditures, which cover social safety net, increased by 10 percent in 1998, as opposed to an increase by 2.8 percent in 1997. Tax revenues from corporate income tax, import duties, and the value added tax on consumption declined substantially as the economic slump occurred in 1998. As the economy recovered in 1999, these tax revenues also rose considerably. In the long run, when the Thai economy regains its pre-shock growth path, the budget deficit will be the problem of

[4] The latest NSO survey shows that monthly income of households rose by 1.9 percent in 1999. In addition, disparities in income between the richest and the poorest have widened from 8.4 times in 1998 to 9.7 times in 1999.

the past, due to through the effect of these automatic stabilizers. The fear of unsustainable public debt would dissipate.

6. Financial Sector Restructuring Policy

Based on the Monetary Model of the IMF (Polak, 1997), conditionality implies that crisis-hit countries are not allowed to bail out financial institutions. Because lending to ailing financial institutions, the monetary base can expand so much that the current account deficit cannot be reduced. The government was able to prevent a systemic banking failure as contagion effects of bank runs began to spread from small banks to large banks. Panic set in where rumors about bank insolvency abound. The announcement of the government to guarantee all deposits in banks and finance companies halted the fear of depositors. All deposits of failed banks and finance companies were substitutes by long term promissory notes honored by the ministry of finance.

6.1 Strengthening rules and prudential regulations

The IMF imposed stringent conditions on the financial sector reform, since root of the crisis is in the financial sector. Households and firms had accumulated debt as a large proportion of income before the crisis broke out, amounting to 1.25 times GDP level. King (1994) finds the evidence that countries that accumulated large amount of debts are likely to suffer a prolonged recession than countries that were less burdened by debts. Economic recovery requires financing. It takes longer time for banks to clean their mountains of non-performing assets and to recapitalize their equity, in particular for banks in countries where bank credits are major source of investment financing. To get out of recession as fast as possible, banks must start lending and injecting new funds to provide liquidity for consumption and investment. Viewed in this light, stringent capital adequacy ratio and strengthened accounting rules on loan-loss provisions and risk-based capital standards, though appropriate for the sound financial system in the long run, may hamper rather than help the economic recovery.

Empirical evidence abounds. Peek and Rosengren (1995) find evidence of a capital crunch, which caused a dramatic reduction in the growth rate of bank credit associated with the 1990-91 recession in New England. Brinkmann and Horvitz (1995) show that the credit crunch was caused by the 1988 risk-based capital standards. Blum and Hellwig (1995) argued that raising capital adequacy ratio can result in a decline in credit extension. In time of economic crisis, bank capital is reduced because of rising bad loans. As a result, banks cut down lending to maintain the stipulated capital ratio. It is important to note that implementation of measures to strengthen the regulatory framework must also consider its macroeconomic impacts.

The process of enhancing bank capital was well underway before the crisis broke out in 1997. In October 1996, the 1st tier capital fund to risk asset ratio (CAR) of commercial banks was raised from 5.5 to 6 percent. For finance companies, the overall CAR was raised from 7 to 7.5 percent and would be raised to 8 percent by January 1998. In January 1997, commercial banks were required to submit monthly reports on real estate credit for large projects that outstanding credits exceeding 100 million baht. At the same time, the Bank of Thailand announced the approval of 3 domestic groups to set up new domestic banks. Ironically, some of these applicants

were some finance companies that were closed down 1998. By March 1997, during the baht defense, the Bank of Thailand required finance companies to submit reports on bills of exchange transactions. Both banks and finance companies must provide against sub-standard loans at least 15 and 20 percent of their capital fund respectively. In June 1997, a month before the float, the Bank of Thailand requested that commercial banks should not sell baht in offshore markets to prevent speculative attacks. The measures described above simply confirmed that rules and regulations were applied after the problems had gone out of control.

According to Johnson (1998), in countries with weak financial systems, local financial institutions have limited capacity to assess and manage risks relating to huge capital inflows. Thai regulatory authorities also have limited supervisory capacity. The country need to develop sound financial institutions, markets, and instruments before they can durably liberalize the capital account. Thus the maintenance of some restrictions on capital transactions may serve to buy time for the adoption of prudential standards and appropriate supervisory arrangements.

Stringent banking rules are imposed. Banks are ordered to comply with higher capital adequacy ratio and they are required to recapitalize after capital write-downs of bad debt. The Bank of Thailand announced the Loan Classification and Provisioning Rule in March 1998. Standard loan is defined as loans for which their interest or principal has not been in areas. This type of loan is subject to provision of one percent. Special mentioned, substandard, doubtful, and doubtful of loss are loans for which their interest or principal have been in arrears more than one month, three months, six months, and twelve months, respectively. The provisioning requirement increases from 2 percent for special mentioned loans, to 20 percent for substandard, 50 percent for doubtful loans, and 100 percent for doubtful of loss. Although these new requirements are precautionary measures for a sound financial system, they are so severe that banks run into a problem of capital crunch. In time of economic slowdown, bank profits declined sharply. Banks themselves have problems raising their capital through issuing new shares because of the collapse in the share prices. The strengthened provisional rules implies that retained earning that can be set aside for capital fund is reduced further. The ramifications of these strict prudential regulations are the negative impact on loan expansion, which is badly needed during early phase of economic recovery. The lack of liquidity and working capital can prolong recession and preclude sustained recovery.

After successful bank recapitalization, either by injection of public funds or by selling majority of bank shares to foreign banks, debt restructuring process is the next important step. For banks to resume normal lending, they must reduce their NPLs, which were supposed to decline following the trend of interest rates. Since the overall NPLs for the whole banking sector was close to 50 percent of total loans at the end of 1999, it would take several years of strong economic growth to generate business profit before we can observe a significant fall in the level of non-performing loans. Despite the fact that new bankruptcy law and foreclosure laws have already come into effect in 1999, there has been no significant improvement in the debt restructuring process.

Non-performing loans of the banking sector rose rapidly as a result of economic slowdown (Figure 11), reaching its peak of 47 percent in May 1999. At the end of

April 2000, the NPLs for the financial system amounted to 36.7 percent of total loans or 1.95 trillion baht. State banks, whose shares in total NPLs for the banking sector are 60 percent, are relatively slow in restructuring loans since their executives fear of violating laws on damage to state assets. About one trillion baht of NPLs are now in civil or bankruptcy court. There has been an improvement as the economy is coming out from recession. The reduction of NPLs was due to restructured debt, write-offs, sell-offs, and transfers to asset management companies. Nevertheless, there are some new NPLs and re-entry NPLs, which are previously restructured loans that turn bad again. Most local banks had fully set aside loss provisions against their bad loans. If these loans are fully written off, NPL would fall to 23 percent.

6.2 Changing Structure of the banking sector

During the boom years, the number of finance and securities companies rose rapidly, but the number of banks remained intact. The government had considered opening three new banks before the crisis broke out. After July 1997, some banks and finance companies experienced severe liquidity problems. The Financial Institutions Development Fund (FIDF) of the Bank of Thailand injected public money to troubled banks.

In a series of measures to deal with financial crisis, the Bank of Thailand ordered 10 finance companies to raise their capital funds. In June 1997, 16 finance companies were suspended, and another 42 in August 1997. Contagious bank runs started as the public confidence in financial institutions eroded, stampede withdrawals led to a system wide crisis. The Financial Restructuring Authority (FRA) was created in October 1997 to review rehabilitation plans for the 58 suspended finance companies, 2 of which were allowed to continue their operations. The 860 billion baht of the colsed finance companies were transferred to the FRA for auction. The average amount of winning bids was below 40 percent of total outstanding balance. The Asset Management Corporation (AMC) was established to act as bidder of the last resort to prevent fire sales of the assets of 56 closed finance companies. The assets bought by AMC will be managed for resale later. The purpose of the AMC is to prevent the fall in price of collateral of the entire financial system.

The panic and contagious bank runs ceased when the FIDF announced a guarantee of deposits and liabilities of the remaining financial institutions to prevent further bank runs. A deposit insurance corporation will finally evolve from the FIDF to provide limited insurance scheme.

The market structure of the Thai banking industry was altered substantially after the bank crisis in 1997 and 1998. The Bangkok Bank of Commerce (BBC) was the first bank that showed signs of financial distress several years before the full-blown crisis occurred. It was unfortunate that the Bank of Thailand did not effectively handle the case of BBC. Injecting huge public funds to the BBC without changing management controls and increasing effective supervision led to cosmetic mismanagement and fraud. The BBC was the place where the crisis of confidence started. In the end, the BBC was ordered to cease its operation in 1998. The Union Bank of Bangkok (UBB) was nationalized and merged with 14 finance companies and changed its name to BankThai (BT). Small banks are mainly family owned business, which are not as resilient as large banks. All small banks at the bottom five suffered a severe blow of

economic crisis. Because of their small sizes, it was easier for their shares to be sold to international banks.

There is the great opportunity for multinational banks to penetrate the previously closed and protected banking sector. The long-awaited concession to the WTO to open the financial sector has already arrived by forced acceptance of foreign participation. The ABN Amro bank from Netherlands took over 75 percent of the share of the Bank of Asia (BOA). The Development Bank of Singapore (DBS) also bought the majority share in Thai Dhanu Bank (TDB). Britain's Standard Chartered Bank acquired 75 percent stake in Nakornthon Bank (NTB). The Lame Thong Bank (LTB) was nationalized and renamed as Radanasin Bank (RSB). The accumulated losses of RSB are five times its capital funds. The United Overseas Bank of Singapore has taken 75 percent of RSB. There has been no strong public objection to these sales, for the public confidence in these banks can be restored with sufficient funds injected from abroad. It is expected that foreign participation would involve the transfer of technology, enhanced credit culture, and intensified competition.

Krung Thai Bank (KTB), a state-owned bank, has acquired the ailing FBCB, assuming the management of FBCB's assets. The approach to FBCB is a typical way of solving banking crisis, where a state-owned bank would assume the control of weak banks. Ironically, KTB was established in the 1950s by the same approach of merging two trouble banks. As a state-owned bank that must maintain the public confidence in the banking system, KTB had to take over the ailing Siam Bank. The Siam Bank itself was the nationalized Asia Trust Bank, which did not survive economic turmoil in the 1980s. Bad asset disposal is crucial for the survival of KTB, whose problem loans were estimated as high as 50 percent (Table 8). Although seriously considering selling its shares to international buyers, KTB hesitated to sell their shares in Thailand's amazing bank sales dominated by international buyers.

Other two medium-sized banks, Siam City Bank (SCIB) and Bangkok Metropolitan Bank (BMB) were nationalized. SCIB's majority stake was in the negotiation stage of being sold to Newbridge Capital, a US-based investment fund, while Hong Kong's HSBC holdings bought 75 percent of BMB at the price of 37 billion baht. Both SCIB and BMB had NPLs above 70 percent of their total loans (Table 8). Most problem loans are over 12 months in arrears. In 1996, BMB pleaded guilty to changes of falsifying records and obstructing a probe by the US bank regulators. BMB closed its branches in San Francisco and New York and paid a fine of $3.5 million. The incidence implies how corporate governance prevails in the banking industry. The IMF was quite right in raising the issue of governance for both corporate and public sector.

The remaining solvent banks struggle to increase capital funds to meet the stringent requirement of the Bank of Thailand. They must raise their capital funds to meet the BIS standard and to provide allowances for non-performing loans. Since they suffer operating losses, the ability to increase provision for bad debts is limited. They can raise their core capital funds (Tier 1) or supplementary funds (Tier 2). Three large banks, Bangkok Bank (BBL), Thai Farmers Bank (TFB), and Siam Commercial Bank (SCB) successfully mobilized capital funds by selling shares to international investors without having to lose their management control.

Through aggressive strategy, six banks in the medium size group were able to gain market shares between 1990 and 1996. Heavy reliance on borrowed money allowed them to increase their lending volume at the expense of larger banks such as BBL and TFB. BBL and TFB adopted a conservative strategy and streamlined their operations by focusing on quality loans. Medium and small banks tend to commit technical errors in lending by mismatching maturity and currencies. Although recession affects all banks alike, some banks are able to survive because they avoid having insider loans and concentration on real estate.

Medium sized banks are having difficulty raising their funds abroad and would have to rely of public funds to match their efforts in raising funds to raise supplementary funds through selling Most banks have not provided sufficient allowances of non-performing loan. The full requirement of 100 percent provision is required by the end of the year 2000. As long as banks have to struggle for maintaining capital standard, it cannot have sufficient funds to increase their lending to the private sector. This is why raising funds from foreign investors is vital for the recovery.

6.3 Debt restructuring measures

In a Letter of Intent in May1998, Thailand was urged to accelerate corporate debt restructuring by strengthening the legal and institutional framework. The reform of bankruptcy act, foreclosure procedures, and foreign investment restrictions. Similarly, in a Letter of Intent in August 1998, the Thai government indicated the intention to accelerate bank and corporate restructuring by changing tax laws and by establishing a Corporate Debt Restructuring Advisory Committee. Thailand is now open to foreign investment through privatization and the conversion of the Alien Business Law into a new and more liberal foreign investment law. Foreigners are allowed majority stakes or full ownership of the Board of Investment's promoted firms. In a Letter of Intent in December 1998, the strategy for corporate debt restructuring by developing an effective monitoring system, establishing bureaus, and reviewing options to implement a system based on incentives, penalties, and arbitration among creditors.

The success of debt restructuring process would reduce the level of NPLs. A decline in the level of interest rate could have resulted in a lower level of NPLs, since it can reduce the financial distress of borrowers. Nonetheless, moral hazard is apparent for some strategic borrowers who refuse to service their debts despite their sufficient capacity. The passage of Bankruptcy law and Foreclosure law is extremely important since the default borrowers would have to consider the high cost of non-compliance.

The approach to financial restructuring is different from Korea, Indonesia, and Malaysia, where the governments took an active approach by nationalization, recapitalization through public money, removal of bad debt, and mergers (World Bank 1999). The governments in these countries removed bad debts from banks and transferred them to centralized asset management companies owned by the governments. That is why the level of non-performing loans in these countries declined faster than in Thailand, where the market-oriented approach is taken. Thai banks were given a transitional period to deal with their own bad debts through establishing their own asset management companies. The government supports the banks by providing tier 1 and 2 typed-capital fund on the conditions that the banks must meet stringent conditions on loss provisions. The entire assets of 56 closed

finance companies, totaling $20 billion, were transferred to the Financial Sector Restructuring Authority (FRA). These non-performing assets will be sold to pay off creditors of the closed finance companies.

The IMF recommended approach to Thailand is slow to take effect because of some technical and institutional problems such as different accounting standards. Since the approach employs the market mechanism, it does not place heavy burden on the budget. It attacks the root of the problem, which stemmed from overvalued assets. Only strong and competent banks can remain in the industry; the weak ones, which cannot increase their capital, must be sold to international buyers. The non-performing assets controlled by the FRA can be sold at auctions. This is a correct approach to get the price right once again. There is some concern that high NPLs would discourage banks from lending and would prevent sustainable recovery. Some large Thai firms, after the crisis, have been issuing debentures aggressively, bypassing the conventional source of funds from commercial banks. As Figure 12 shows, the level of private investment has rebounded considerably from its lowest level in 1998, despite the fact that the bank credit in real terms was still shrinking. The Thai debt restructuring process recommended by the IMF is the area where the recommendation is different from other troubled Asian countries. The market-oriented approach adopted by Thailand would be vindicated by the end of the year 2000.

7. Concluding remarks

The Thai government has borrowed $13.47 billion out of the $17.2 billion IMF standby credit agreement signed in August 1997. Nevertheless, there would be no need to borrow further because the level of international reserves is sufficiently high at $32 billion--a far cry from the floor level of $23 billion required by the IMF. The Thai economy grew by 4 percent in 1999. The unemployment rate fell to 4.7 percent in February 2000 from 5.2 percent during the same month in the previous year. Thailand scheduled to exit IMF program in June 2000. Repayments to the IMF will be made in eight equal amounts from 2000 to 2003. Over the last three years, Thailand's case can provide a good lesson for crisis-hit countries that have to depend on the IMF fund. The finding in this research can be summarized as follows.

The IMF conditionality implies a ceiling on domestic credit and a floor on the level of international reserves. To deny bailing out ailing financial institutions and printing money to finance public deficit, the central bank must establish its credibility and independence. Greater independence of the central bank, although does not guarantee price stability, would reduce the time inconsistency problem of monetary policy. Viewed in this light, the IMF conditionality on good governance, accountability, and transparency are highly desirable. Without pressure from external factors, development of institutional framework would come only gradually from internal initiatives. In addition, without stringent rules on accounting standard, timeliness of data, prudential banking rules and regulation, and overhauling of legal system regarding bankruptcy and foreclosure laws, sustainable recovery would be next to impossible.

In deep recessions, financial instability becomes apparent and pervasive as output declines. Financial crisis prolongs economic recession and prevents sustainable recovery. In times of prosperity, cyclical excess leads to financial fragility, as

speculative finance become the predominant means of debt accumulation. Macroeconomic stability and financial instability are therefore incompatible, whereas boom-bust cycles and financial crises are intricately related. Implementation of measures to enhance stability of the financial system during the economic downturn, as imposed on Thailand by the IMF, must take in to account its macroeconomic impact that might further delay economic recovery.

In the short run, temporary capital controls are necessary to make monetary policy become effective and to prevent capital flight. Floating a currency in the period of speculative attacks is not recommended. In the longer run, when crisis of confidence is over, the country may gradually permit the exchange rate to be determined by market forces. And once the crisis-hit country has floated the currency, the central bank should not intervene to maintain or produce a certain level of the exchange rate[5].

Despite various bailout efforts by the Bank of Thailand, through the injection of liquidity for more than one trillion baht, seven banks out of the total of 15 banks were intervened and nationalized. Fifty-six finance companies from the total of 91 companies were closed down. The financial crisis has completely altered the Thai banking industry. The excessive number of firms has been reduced. Financial institutions have become more efficient and transparent. Competition is intensified by arrivals of new international banks that have major stakes in weak domestic banks. Bank governance can be improved, while transparency and accountability strengthened.

After the crisis, overreaction was shown in the attempt to restore public and international confidence in the banking sector by raising the most stringent banking standard rules and regulation during the time when the weak economy badly need liquidity. Although, time inconsistency problem always remains in formulating monetary policy strategy, transparency and accountability should prevail. Thanks to the IMF for imposing conditions on the Bank of Thailand for releasing timely information on macroeconomic data on a regular basis.

A simple model is developed to show that a country might experience a severe contraction after devaluation. In an economy, where bank credit is the most important source of funds for investment and firms and banks' liabilities are dominated by unhedged dollar-denominated debt. If the rate of depreciation exceeds the threshold level that triggers technical bank failure, bank lending can contract. Shortages of loanable funds can also arise from redistributive effects of bank deposits withdrawals from aggressive to conservative banks. A Sharp decline in investment and durable consumption would follow. The 1998 recession in Thailand was considered here as evidence of a contractionary devaluation.

As argued by Stiglitz (2000), the policy prescriptions should not be a standard package applied to any countries in trouble. They should be constructed in the context of domestic social and political factors. In the case of Thailand, the private sector deficit-not the public sector-- was the main cause of the current account deficit. In

[5] An attempt to maintain a large volume of international reserves suggests that the Bank of Thailand does not strictly adhere to market forces.

addition, the structural adjustment policies were imposed from the IMF rather than cooperating with consensus from recipient countries to draft reform packages.

The IMF mission to Thailand underestimated the severity of the output contraction; therefore, they prescribed contractionary fiscal policy since they incorrectly anticipated a turnaround of the Thai economy in 1998. At the same time, they overestimated the inflation rate and the current account deficit. One cannot argue that the macroeonomic forecasting mechanism of the IMF has a serious flaw.

The IMF should place more emphasis on the prevention of the outbreak of the crisis. In particular, the pre-crisis policy prescriptions should involve providing instantaneous fund support for countries that suffer from currency attacks. Although the international bailout program may involve the issue of moral hazard, the damage from the moral hazard behavior of borrowing countries may be relatively small, comparing to the high cost of contagion effect. As long as there is a negative externality, the intervention by international lending agencies is justified. Furthermore, the moral hazard behavior can be discouraged by applying penalty rate of interest to countries in need of urgent fund. This recommendation does not suggest the IMF bail out of all countries that maintain unrealistic level of exchange rates. What is suggested is that such countries should be able to buy time to exit from the fixed exchange rate smoothly--not being forced to permit a free fall in the exchange rate. As evidence from Thailand in 1997 attested, the free fall of the baht created unnecessary collapses in other countries' exchange rates.

The United States and Japan should coordinate their policy to avoid a large swing in their exchange rates. The rapid changes in the yen-dollar exchange rate can easily jeopardize the long-term development of developing nations. The experience of stability of Asian currencies in 1999 indicates that their governments can refrain from employing restrictive monetary policy. The domestic monetary policy can then be used to stimulate domestic demand rather than to raise the interest rate to maintain their currency values.

The IMF has regarded Thailand as a successful case for undergoing through structural adjustment programs with impressive recovery. Although there are heavy cost Thailand have to pay in terms of output loss, the impact of such reforms will be long lasting. In particular, the development of legal framework, governance, and institutional reforms would definitely help create an efficient and sound financial system.

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Table 1

Growth Decomposition from Aggregate Demand

(Percentage point)

	GDP growth	Consumption	Investment	Government	Net Exports
Hypergrowth					
1988	13.3	5.17	6.25	0.44	-3.06
1989	12.2	6.36	6.91	0.26	-0.31
1990	11.2	7.24	9.92	0.63	-4.05
Steady growth					
1991	8.6	3.10	4.95	0.55	0.16
1992	8.1	4.82	2.69	0.55	1.47
1993	8.4	4.71	3.71	0.43	4.56
1994	8.9	4.46	4.68	0.68	-0.41
1995	8.8	4.09	4.61	0.44	-2.88
Downturn and recession					
1996	5.5	3.46	2.52	0.78	-0.38
1997	-1.3	0.30	-8.61	1.59	6.56
1998	-9.9	-11.18	-11.71	1.10	11.01

Source: Calculated from data provided by the Bank of Thailand. Percentage contributions are ratios of changes in aggregate demand components to previous year GDP level.

Table 2

Period Average Growth Rate and Volatility in Monetary Aggregates

	1987-1990	1991-1996	1997-1999
Monetary Base	18.2	16.0	4.19
(%change)	(0.196)	(0.298)	(1.995)
V1(GDP/M1)	10.53	10.91	10.79
Velocity	(0.046)	(0.028)	(0.021)
m1(M1/Mbase)	1.15	1.03	0.92
Money multiplier	(0.035)	(0.039)	(0.054)
V2(GDP/M2)	1.55	1.29	1.04
Velocity	(0.052)	(0.039)	(0.048)
m2(M2/Mbase)	7.63	8.75	9.66
Money multiplier	(0.071)	(0.043)	(0.094)
Credit Multiplier	6.87	10.13	12.42
(Credit/Mbase)	(0.121)	(0.106)	(0.07)
Credit/GDP	0.59	0.92	1.25
	(0.102)	(0.141)	(0.04)
Bank Credit	22.06	22.09	13.07
(%change)	(0.254)	(0.197)	(0.838)
Semi -Credit	1.15	0.61	0.44
Elasticity of Investment	(0.191)	(0.328)	(2.682)
ICCR	0.154	0.025	0.005
Incremental Capital Credit Ratio			
Private Investment Index		-3.36	-38.1
(%change)		(-5.26)	(-1.24)
MPI: manufacture Production Index		9.46	-2.0
(%change)		(0.41)	(-4.32)

Note: numbers in parentheses are coefficients of variation of corresponding variables.

Table 3

Macroeconomic Framework and IMF Performance Criteria

		Aug97	Nov97	Feb98	June98	1998 (actual)
Growth	1996	(6.4)				
	1997	2.5	0.6	-0.4		
	1998	3.5	0.5	-3.5	-5.0	(-10.0)
Inflation	1996	(5.9)				
	1997	7.0	6.0	(5.6)		
	1998	8.0	10.0	11.6	10.5	(8.1)
Current A/C	1996	(-7.9)				
	1997	-5.0	-3.9	(-2.2)		
	1998	-3.0	-1.8	3.9	6.9	(13.0)
Fiscal balance	1996	(2.3)				
(%GDP)	1997	-1.1	-0.9	(-1.0)		
	1998	1.0	1.0	-1.6	-2.4	
M2A	1996	(12.7)				
	1997	7.0	1.5	3.1		
	1998	11.0	6.8	5.1	9.0	(6.1)
Reserve M	1996	(12.0)				
	1997	8.0	4.4	(4.7)		
	1998	11.0	6.8	6.9	7.0	
Consumption	1996	(6.2)				
(%)	1997	3.3	0.5	(0.1)		
	1998	0.8	-1.1	-5.0	-8.0	
Investment	1996	(6.7)				
(%)	1997	-10.2	-13.3	(-16.0)		
	1998	-0.8	-6.5	-21.0	-24.0	

Note: Figures in parentheses are actual values. All variables are percentage change, except current account and fiscal balance are expressed as percentage of GDP.

Table 4: Unit Root Tests

VARIABLE	ADF Statistic	VARIABLE	ADF Statistic	Critical Value One percent
MBASE	0.125	**Δ MBASE**	-5.46	-3.49
MPI	-1.05	**Δ MPI**	-5.05	-3.49
SALE	-0.461	**Δ SALE**	-7.98	-3.51
PII	-0.83	**Δ PII**	-4.24	-3.49

Note: Variables are measured in the logarithmic form of the ratio of its actual value to trend. Mbase = Monetary base, MPI = Manufacturing Production Index, SALE = sales of department stores, PII= Private Investment Index

Table 5

Johansen Tests for cointegration

(VAR with four lags, constants and time trends)

A. Tests for Δ MPI and Δ Mbase (1990:2-1999:6)

H_0	H_1	Eigenvalue	LR	Critical value (1%)
r = 0	r=1	2.331	69.2	30.45
r ≤ 1	r=2	0.237	30.5	16.26

B. Tests for Δ MPI, Δ PII, Δ SALE, and Δ Mbase (1990:2-1999:6)

H_0	H_1	Eigenvalue	LR	Critical value (1%)
r = 0	r=1	0.447	138.3	70.1
r ≤ 1	r=2	0.389	83.6	48.4
r ≤ 2	r=3	0.271	42.3	30.4
r ≤ 3	r=4	0.170	15.7	16.2

Note: Cointegration likelihood ratio (**LR**) tests based on maximum eigenvalue of the stochastic matrix. H_0 and H_1 denote the null and the alternative hypothesis, respectively.
r denotes the number of cointegrating vectors.

C. Cointegrating vectors

Δ MPI	Δ PII	Δ MBASE	Δ SALE	
-27.018	-0.925	125.615	11.637	(unnormalized cointegrating coefficients)
(1.00)	(0.034)	(**-4.649**)	(-0.431)	(normalized)

Table 6

Spending and Debt Per Capita : Before and After Crisis

Consumption /Income

	1994	1996	1998
Nationwide	0.92	0.85	0.83
Bangkok	0.83	0.79	0.79
Central	0.9	0.87	0.86
North	0.95	0.84	0.84
Northeast	1.01	0.9	0.85
South	0.94	0.89	0.84

Debt /Income

	1994	1996	1998
Nationwide	0.31	0.4	0.47
Bangkok	0.35	0.46	0.43
Central	0.37	0.36	0.43
North	0.3	0.4	0.5
Northeast	0.27	0.41	0.54
South	0.25	0.32	0.39

Growth Rate of Real Per Capita Income

Nationwide		22.1	0.2
Bangkok		26.9	-6.1
Central		15.5	3.3
North		24.6	2.8
Northeast		23.5	-0.4
South		16.3	0.4

Source: The National Statistical Office

Table 7

Fiscal Budget: Before and After Crisis
(Percentage Change)

	1996	1997	1998	1999
Expenditure:				
Direct Tax				
Personal Income Tax	22.18	3.67	10.19	-25.30
Corporate Income Tax	8.28	-6.15	-46.71	19.77
Indirect Tax				
Import Duty	-4.4	-22.15	-35.74	20.40
VAT	26.55	2.78	-5.14	-10.59
Revenue:				
Economic Classification				
Current Expenditure	14.78	2.64	10.65	6.79
Capital Expenditure	53.95	13.58	-24.15	-17.44
Function Classification				
Economic Service	49.32	-1.05	-15.15	-6.87
Social Service	23.24	12.75	4.85	-2.38
Defence	5.82	-2.05	-12.26	-13.23
General Admin. Service	28.11	7.07	-7.8	0.64

Source: BOT

Table 8

Non-performing Loans of Thai Commercial Banks after the Crisis

	Dec-97	Jun-98	Dec-98	Sep-99
BBL	16.8	32	48	49.01
TFB	17.3	35.33	40.25	38.04
KTB [State Bank]	21.6	43.17	33.68	51.36
SCB	11.7	22.18	34.92	23.8
Large	16.85	33.17	39.21	40.55
BAY	13.6	25.5	37.22	35.57
TMB	15.5	35.76	32.16	32.65
FBCB**	45.4			
SCIB *	30.1	56.2	58.49	70.57
BBC**	30.5			
BMB *(HSCB)	33.4	72.38	74.72	75.39
Medium	28.08	47.46	50.65	53.55
BOA (ABN)	12.6	33.82	39.33	48.88
TDB (DBS)	14.3	37.47	48.67	47.51
UB*	24.8			
NTB *(SC)	10.6	33.71	42.53	58.8
LTB*	55.9			
RSB # (UOB)		92.67	75.25	92.01
BT~		44.96	96.07	77.16
Small	23.47	48.526	60.37	64.872

Note: * Nationalized in 1998, # consolidated from LTB and defunct finance companies

~ consolidated from UB and other defunct finance companies , ** absorbed by KTB

( ) indicates names of international banks with 75 percent stake

HSCB = Hongkong and Shianghai Banking Corporation
ABN = ABN Amro
DBS = Development Bank of Singapore
SC = Standard Charter Bank
UOB = United Oversea Bank

Figure 1. Tight Monetary Policy and Exchange Rate Stability

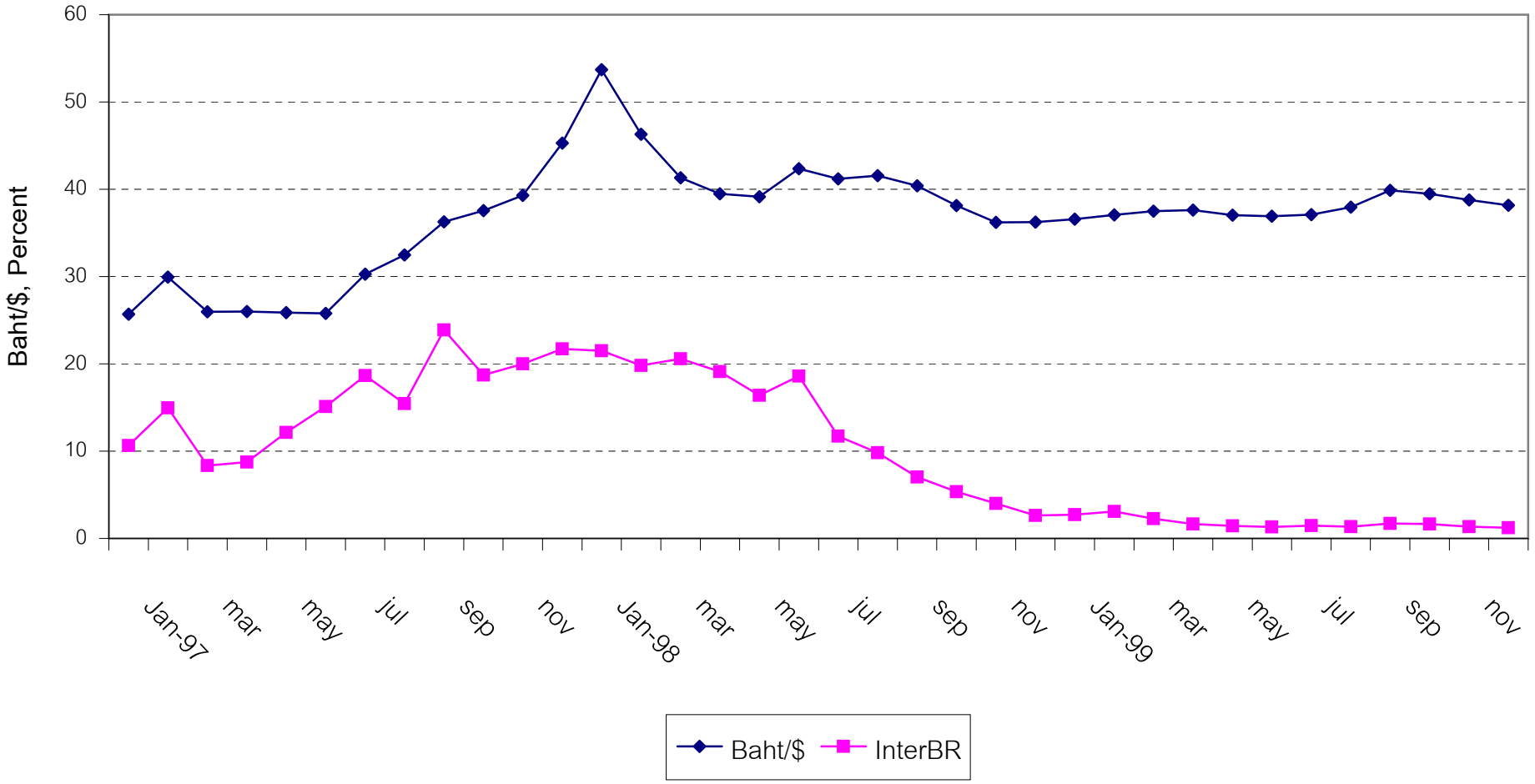


Figure 2. Contraction in Real Monetary Aggregates

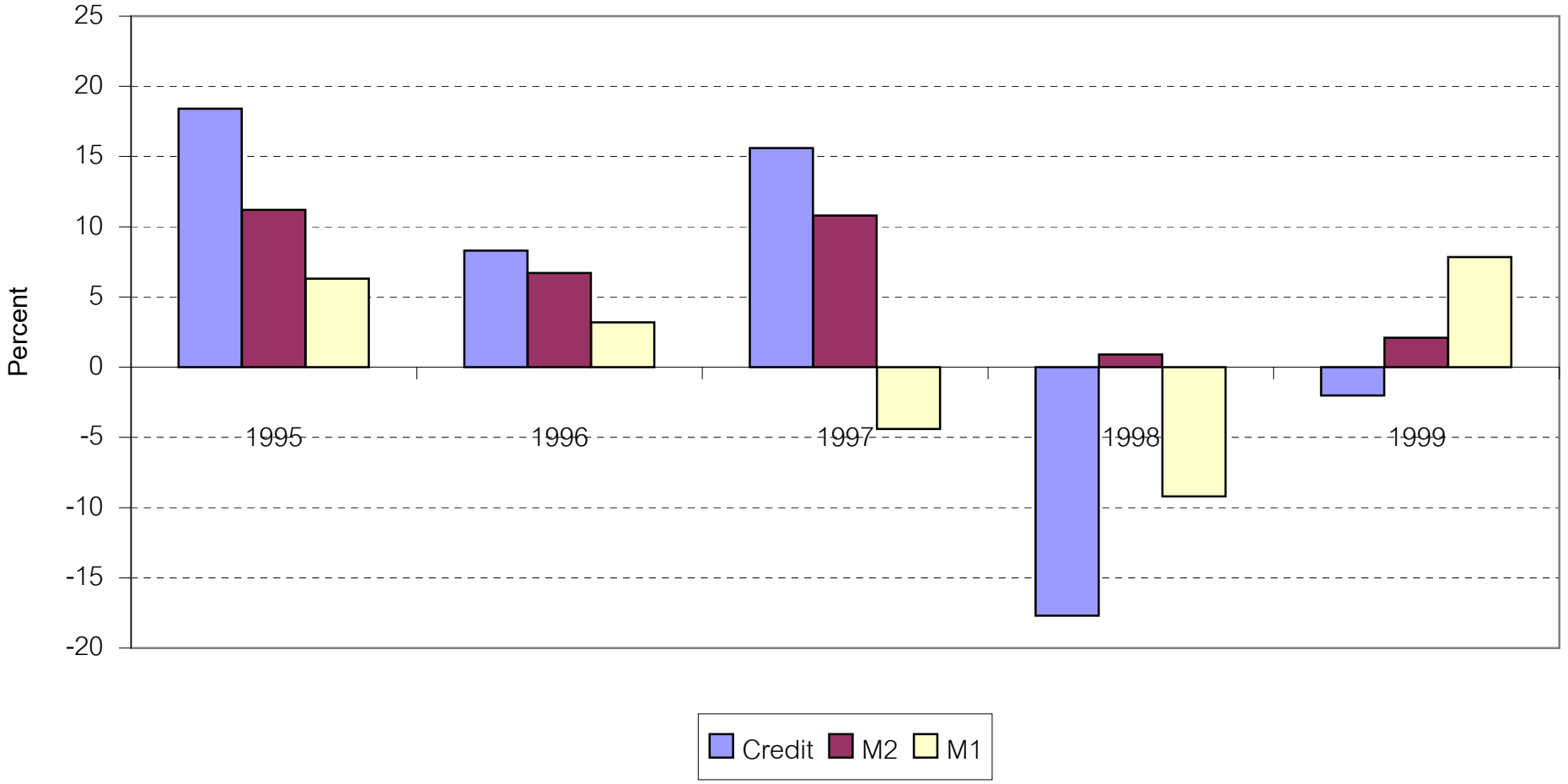


Figure 3. Compression in Private Consumption in Asian Countries

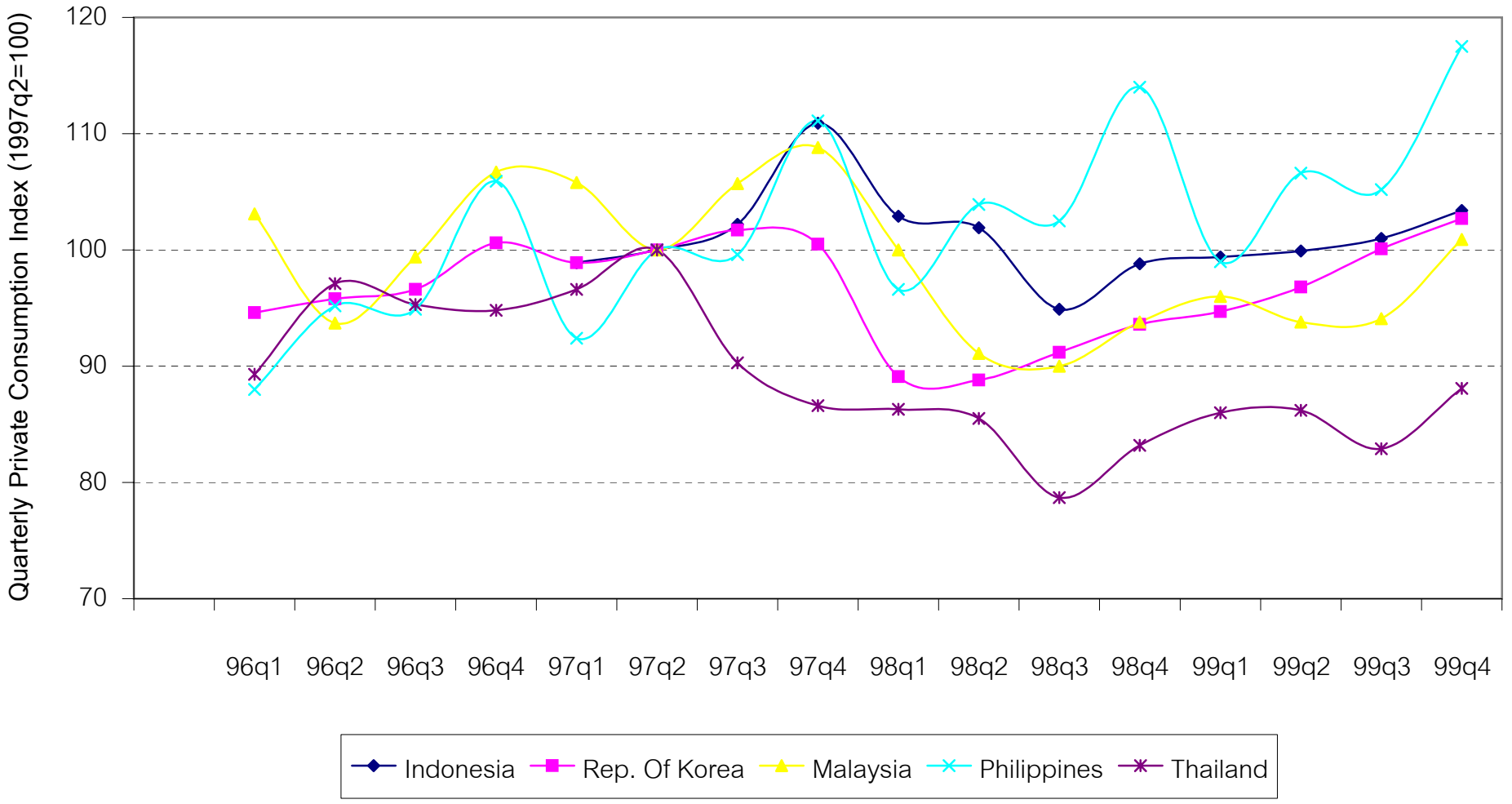
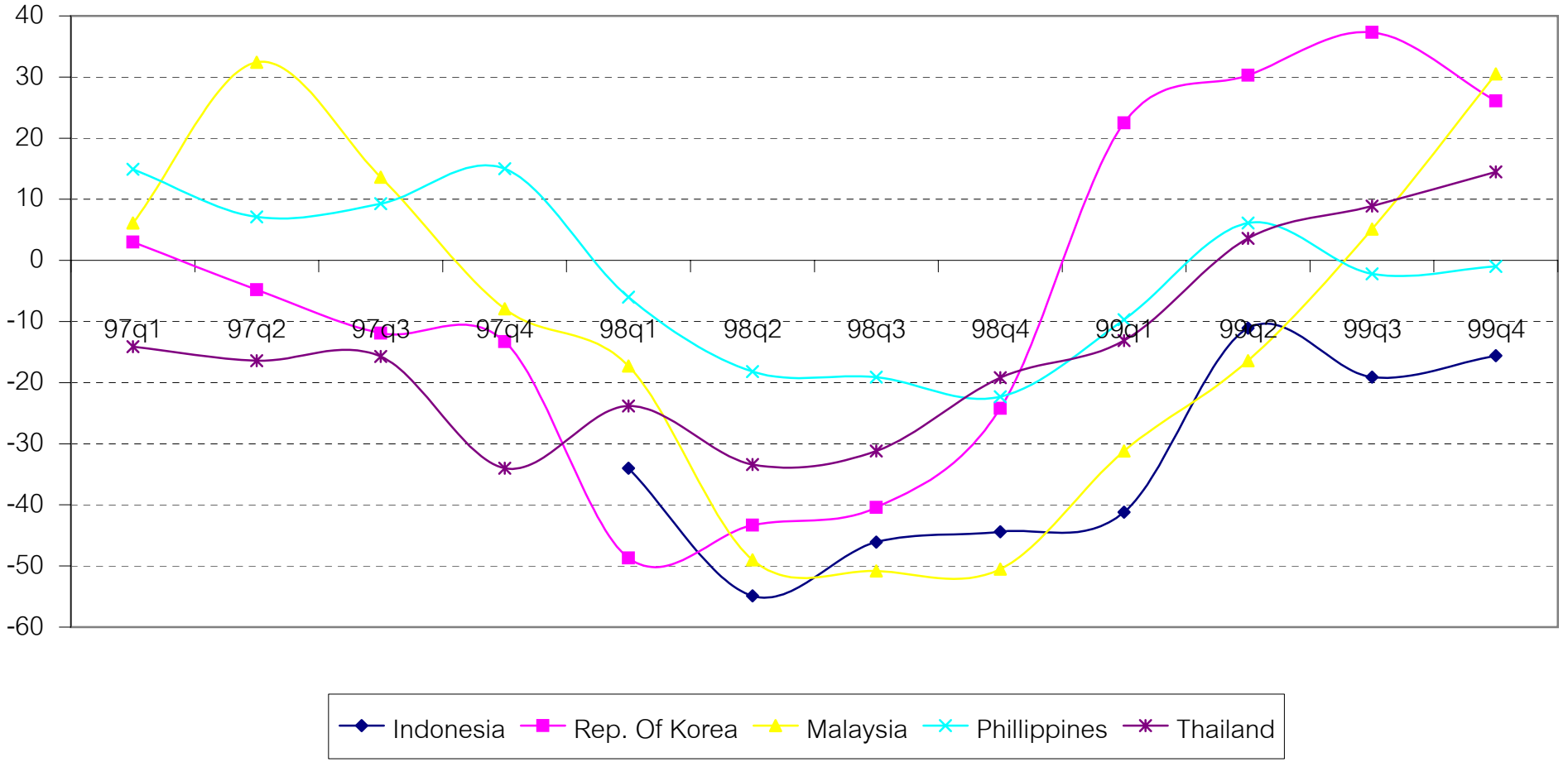


Figure 4. Private Investment Collapses in Asian Countries

(Percentage Change)



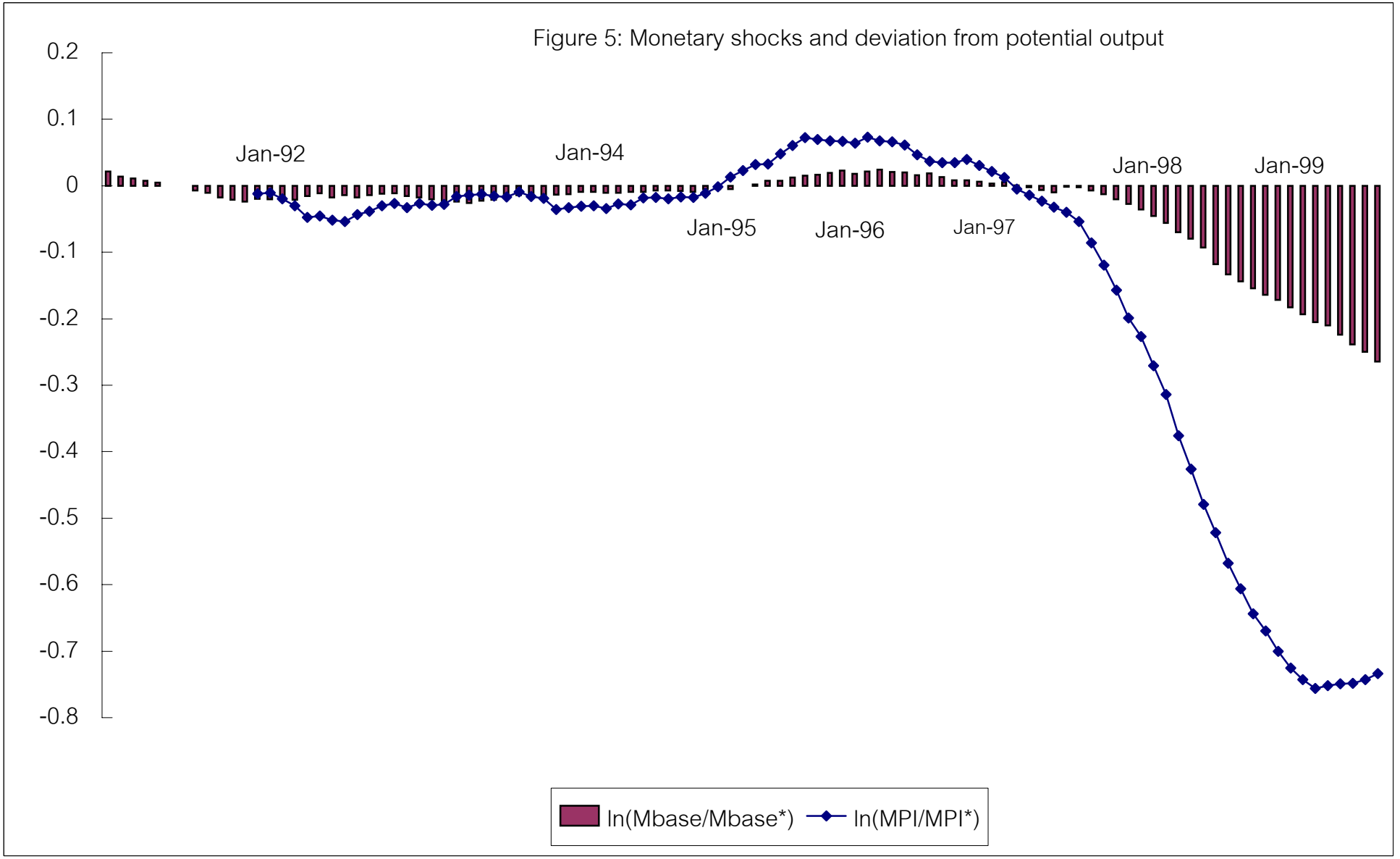


Figure 5: Monetary shocks and deviation from potential output
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
Jan-92
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
ln(Mbase/Mbase*)
ln(MPI/MPI*)

Figure 6: Capital Flight and Exchange Rate Depreciation

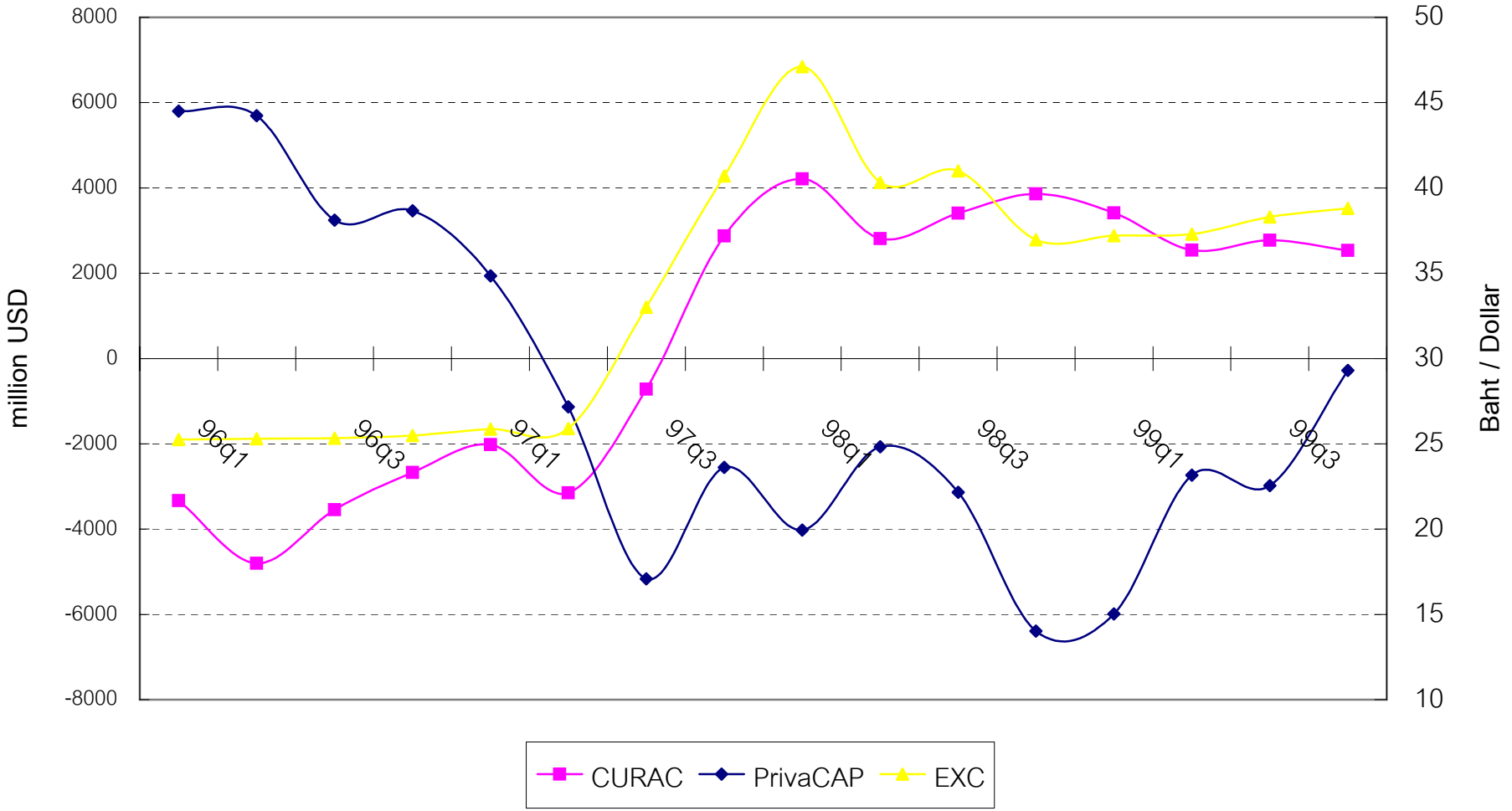


Figure 7: Exchange Rates and Growth of Exports and Imports

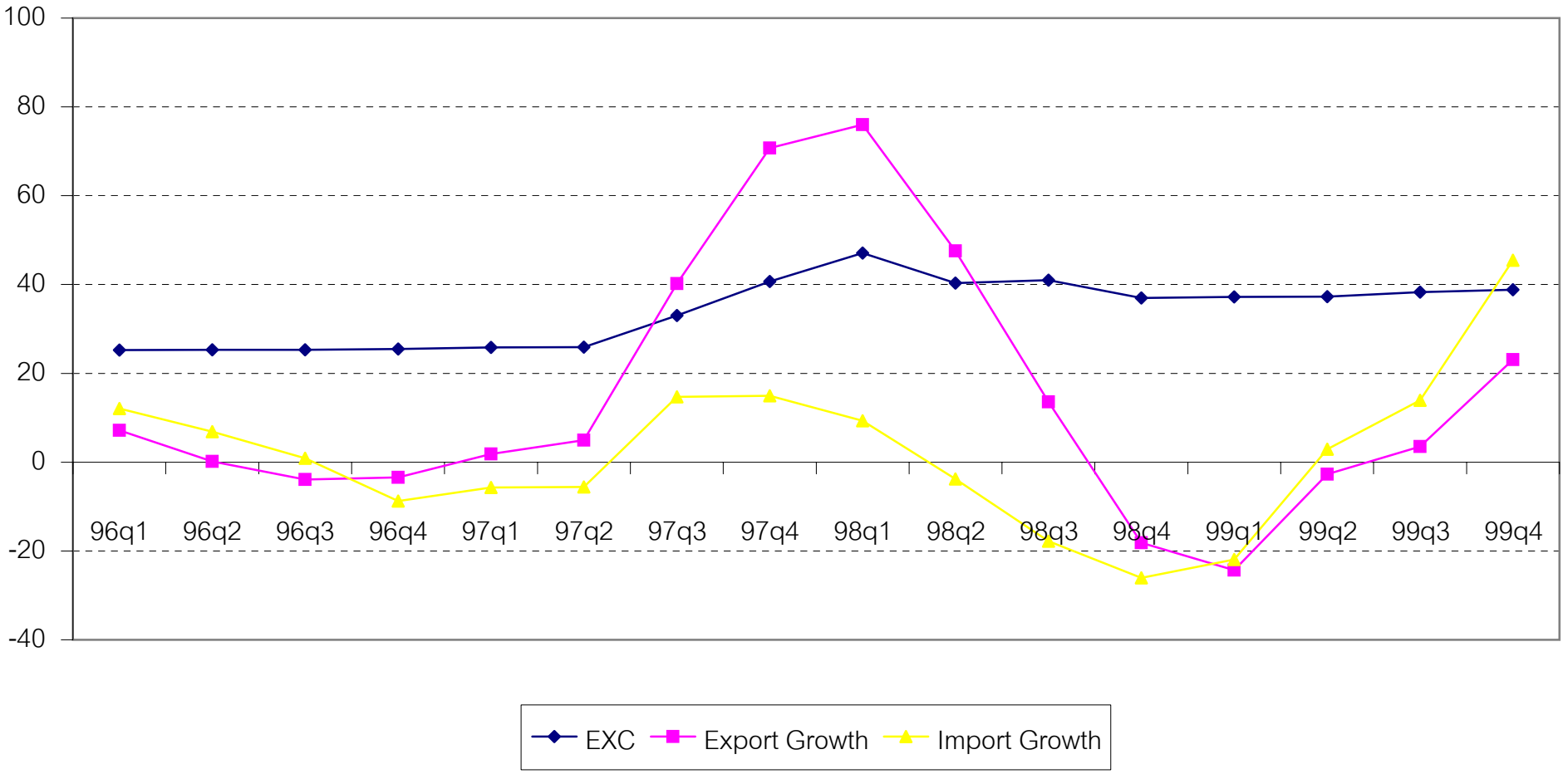


Figure 8: Export Growth and World Economic Expansion

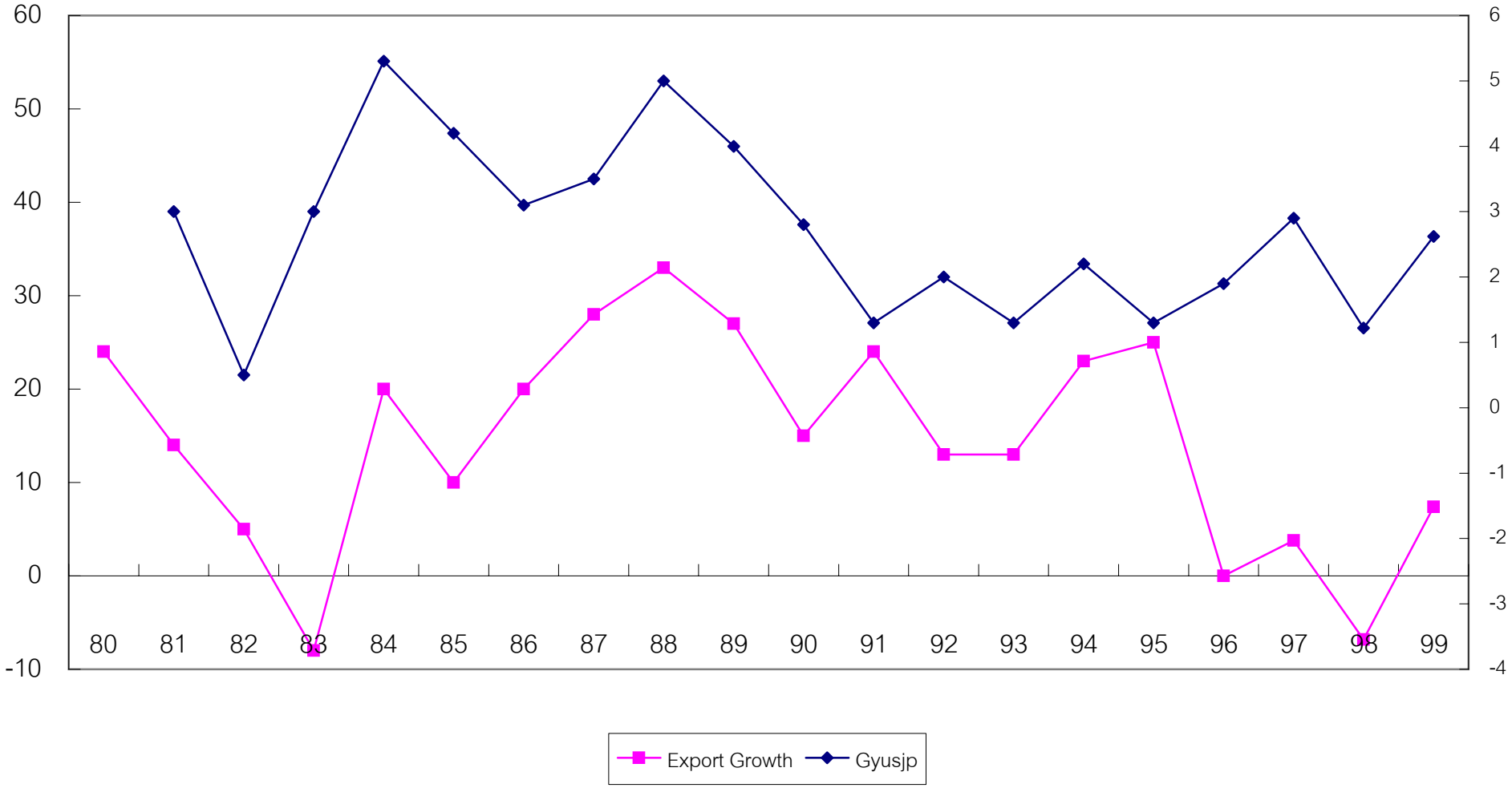


Figure 9. Changes in Exchange Rate(EXG) and Manufacturing Production Index (MPI)

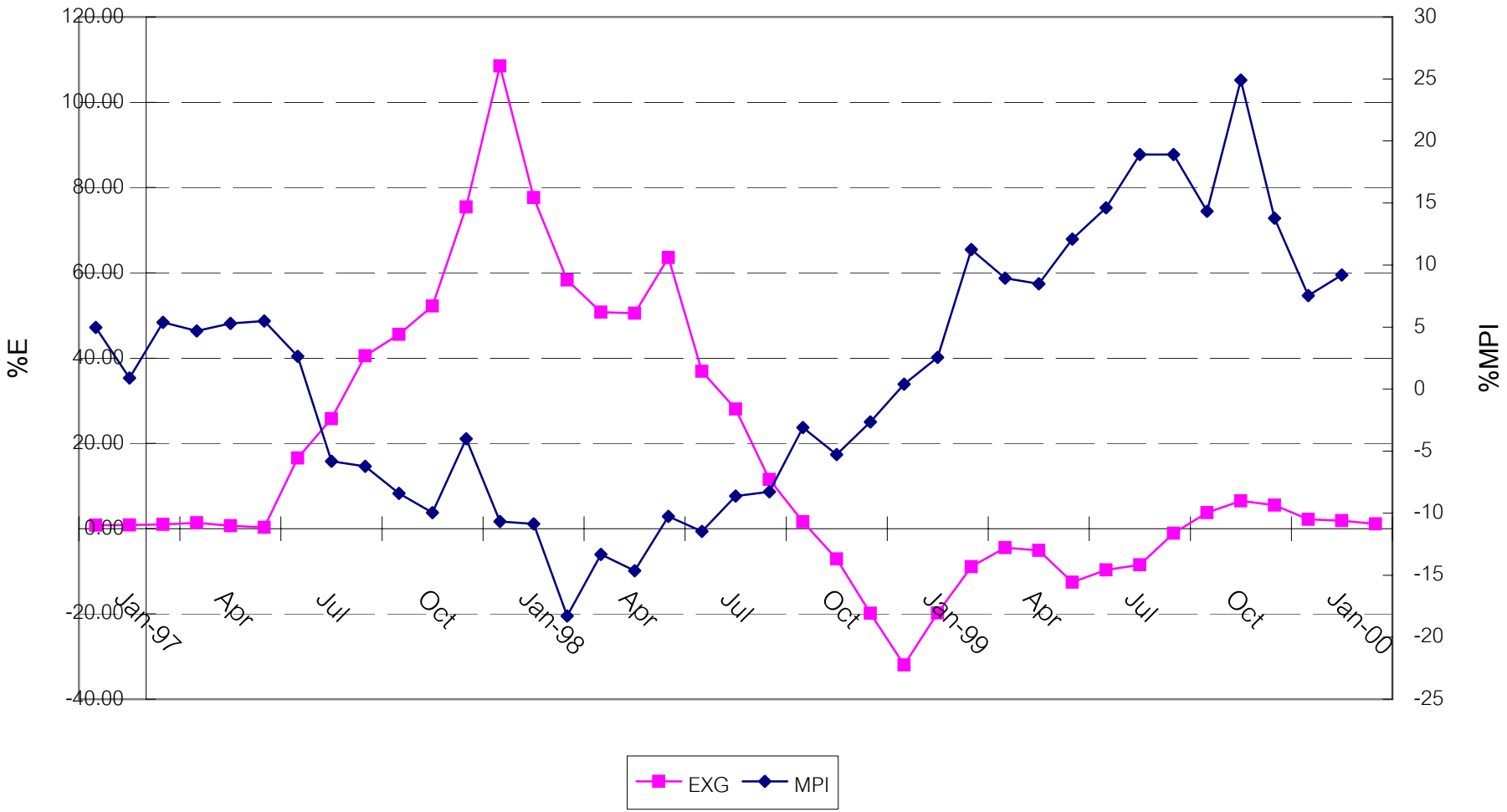


Figure 10. Fiscal Restraint and Revenue Collapse

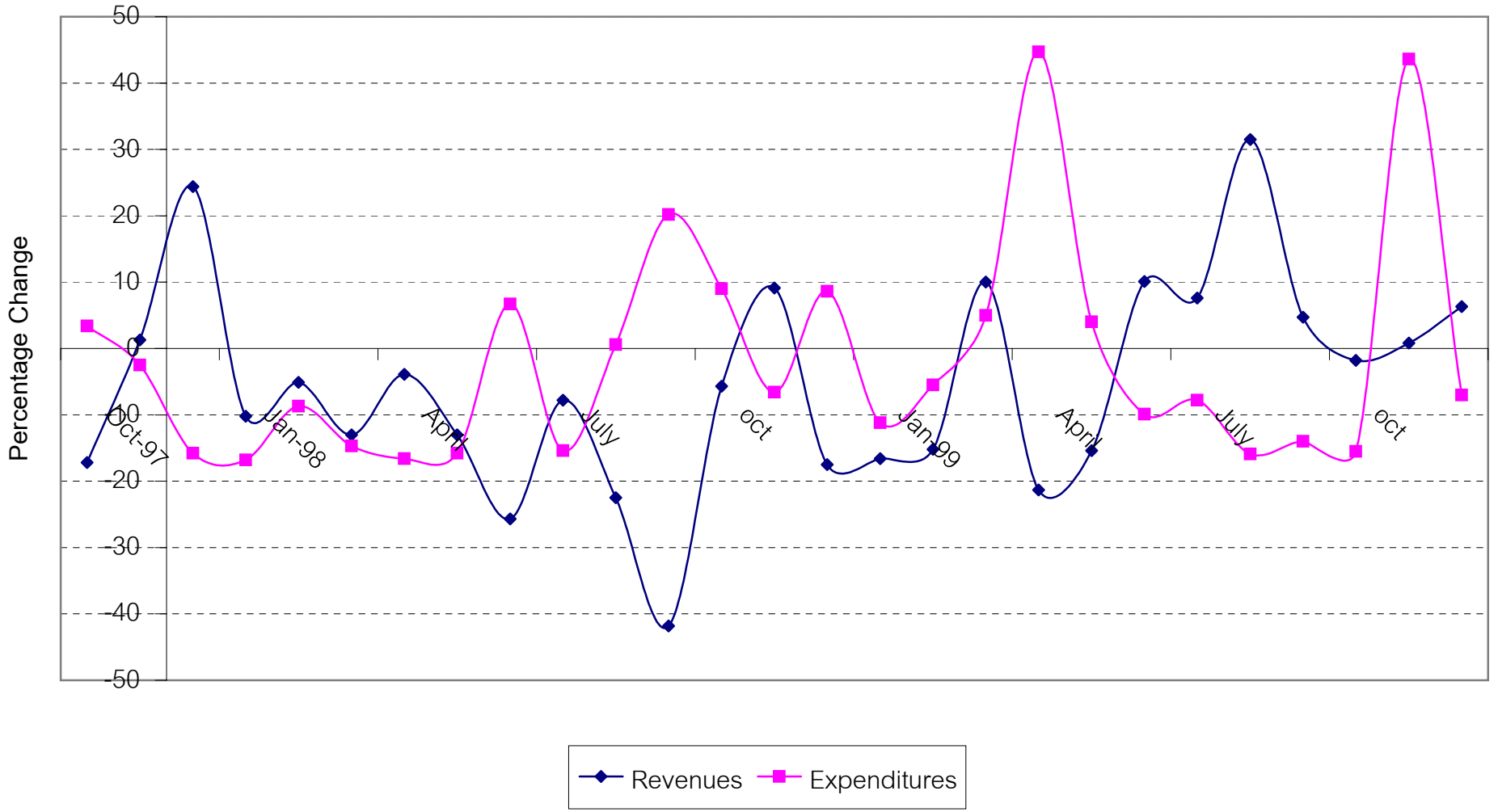


Figure 11: Non-performing loans

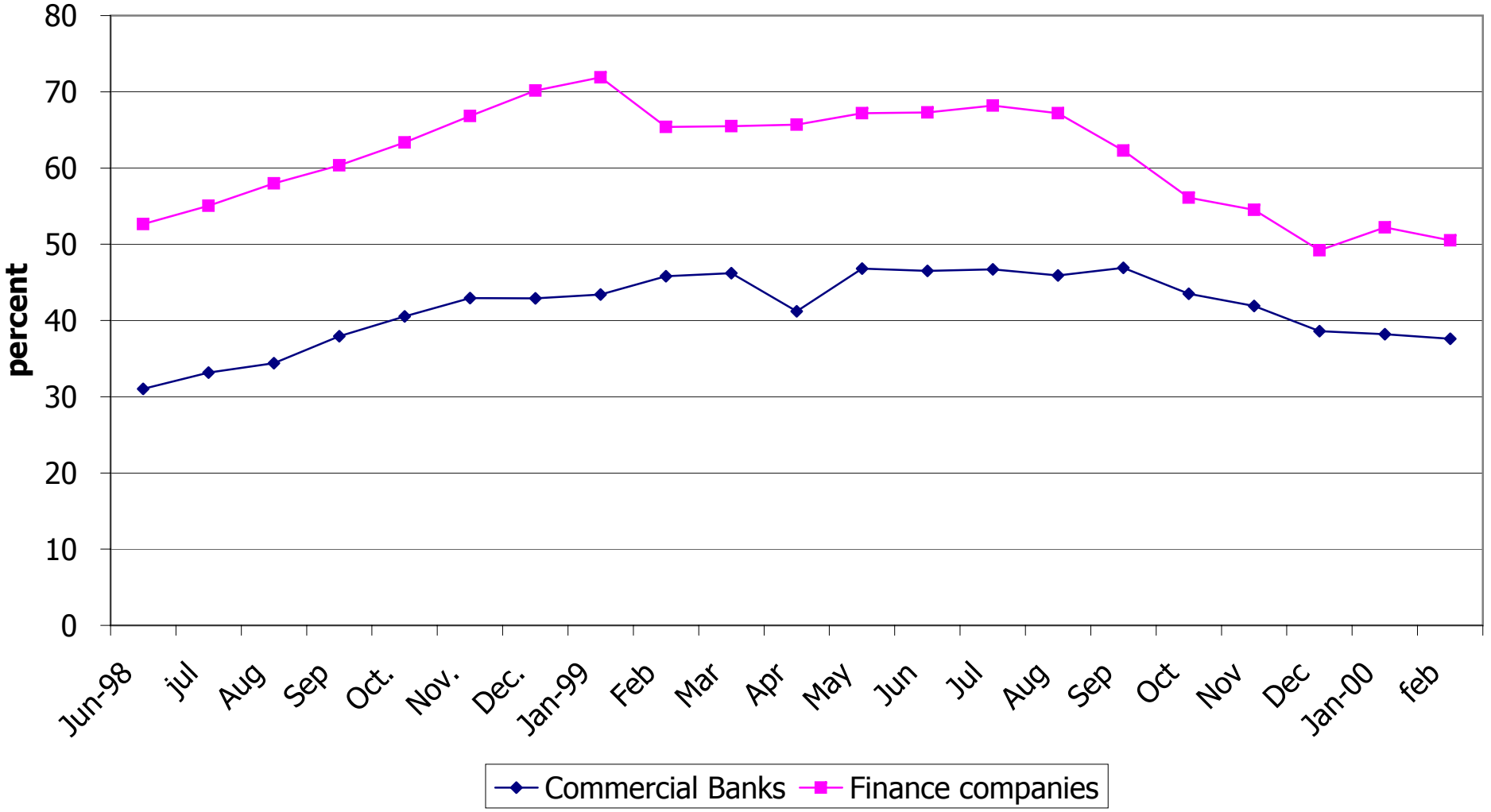


Figure 12. Real Bank Credit and Private Investment

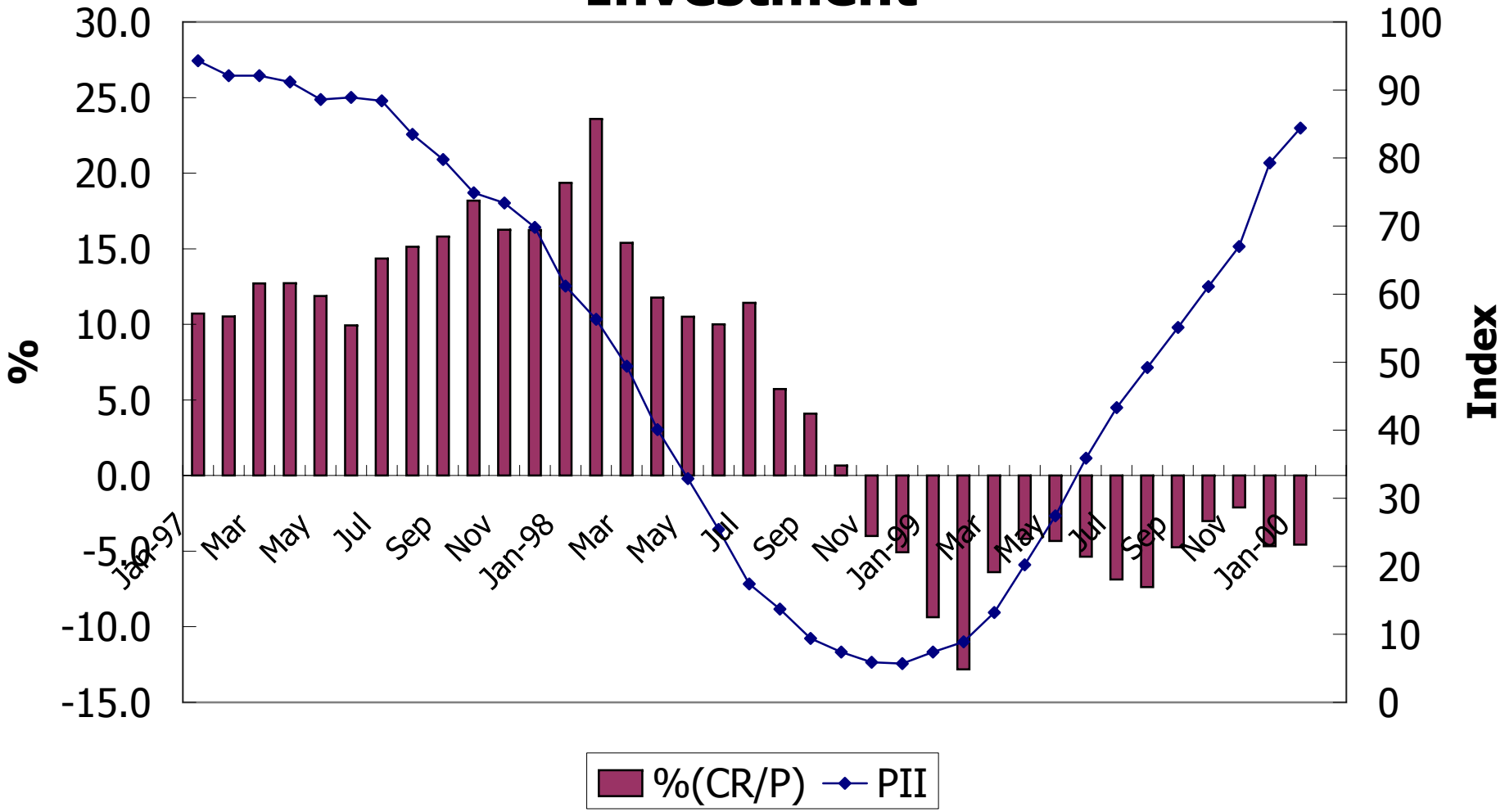


Figure Notation:

Figure 1:	InterBR	Interbank rate
Figure 5:	Mbase	Monetary Base
	Mbase*	Trend of Monetary Base
	MPI	Manufacturing Production Index
	MPI*	Trend of Manufacturing Production Index
Figure 6:	CURAC	Current Account
	PrivaCAP	Privagte Capital Flows
	EXC	Exchange rate (bath/Dollar)
Figure 7:	EXC	Exchange rate
Figure 8:	Gyusjp	Weighted Average of the Growth rates of USA and Japan
Figure 9:	EXG	Rate of change of the exchange rate (baht/dollar)
	MPI	Manufacturing Production Index
Figure 12:	CR/P	Real Credit of Commercial Banks (deflated by CPI)
	PII	Private Investment Index

Sources: for Figures 1-2, 5-12: data obtained from the Bank of Thailand (www.bot.or.th)

Sources for Figures 3-4: data obtained from the Asian Development Bank (www.adb.org)