Inflation Report

January 2008

The *Inflation Report* is prepared quarterly by staff of the Bank of Thailand with the approval of the Monetary Policy Committee (MPC). It serves two purposes: (1) to provide a clear forward-looking framework for economic and inflation forecasting to assist the MPC in making monetary policy decisions and (2) to give the MPC an opportunity to present the explanation for their decisions on various policy issues to the public.

Although individual MPC members may have differing opinions regarding the assumptions on which the forecasts are based, as a group they are in agreement with the forecasts on the outlook for inflation and output as well as the risk factors involved as illustrated in the fan charts.

The Monetary Policy Committee:

Mrs. Tarisa	Watanagase	Chairman
Mrs. Atchana	Waiquamdee	Vice Chairman
Mr. Bandid	Nijathaworn	Member
Mr. Aran	Thammano	Member
Mr. Chakramon	Phasukavanich	Member
Mr. Ampon	Kittiampon	Member
Mr. Karun	Kittisataporn	Member

Thailand Monetary Policy Strategy

Monetary Policy Formulation

- The Monetary Policy Committee (MPC) sets monetary policy in order to attain price stability conducive to sustainable economic growth. The MPC also monitors factors contributing to external stability and financial imbalances.

The Monetary Policy Instrument

- The MPC utilizes the 1-day repurchase rate as the key policy rate to signal the monetary policy stance.

The Target

- The MPC uses core inflation (excluding raw food and energy) as its policy target with the range of 0-3.5 per cent (quarterly average). In the event that the target is missed, the MPC is required to explain the reasons thereof to the public.

Forecasting Tools

- To assist the MPC in making monetary policy decisions, the Bank of Thailand has developed a macroeconomic model to forecast economic conditions and inflation outlook. The model is also employed to evaluate the impact of various factors on the economy and to offer guidelines for appropriate monetary policy responses.

Contents

1. Overview

In 2007 Q3, Thailand's economic growth registered at 4.9 per cent year-on-year, an acceleration from 4.2 per cent and 4.3 per cent growth in 2007 Q1 and 2007 Q2 respectively, from the pickup in domestic demand. In turn, this domestic demand growth was driven by an expansion in private demand, both from the gradual acceleration in consumption and the rebound in investment following two subsequent quarters of contraction. As a result, the Thai economy in 2007 Q3 expanded by more than previously expected by the MPC.

Table 1.1 GDP at 1988 prices

Unit: %Δyoy	2006	2006		2007		
		Q3	Q4	Q1	Q2	Q3
Domestic demand[1/]	3.2	2.9	1.9	1.4	1.5	3.1
Private consumption	3.0	2.8	2.7	1.3	0.8	1.9
Private investment	3.7	3.2	1.9	-2.3	-0.7	1.1
Public expenditure	2.3	3.2	-4.0	9.4	9.2	9.8
Net exports of goods and services	40.5	2.2	18.0	34.6	36.4	7.4
Exports of goods and services	8.5	4.7	7.2	8.2	7.6	3.5
Imports of goods and services	2.6	5.4	4.4	1.6	2.3	2.4
Gross domestic product	5.1	4.5	4.3	4.2	4.3	4.9

Note: %Δyoy = percentage change from the previous year
[1/]Domestic demand excludes changes in stocks
Source: National Economic and Social Development Board

Subsequently in 2007 Q4, preliminary indicators reflected a continued recovery from the previous quarter. Both the private consumption and investment indices increased at an accelerated pace compared to 2007 Q3, supported by an improvement in consumer and investor confidence following the referendum on the new Constitution in August, which resulted in increased certainty in the political situation. In addition, monetary policy in the preceding periods had remained accommodative, while an acceleration of fiscal spending continued to stimulate economic activity in the private sector. On the external front, external demand grew robustly, with exports continuing to expand even as the Thai baht strengthened, leading to some loss of price competitiveness. The solid performance in export growth came about as a result of structural reforms in the Thai export sector towards greater diversification, both in terms of export goods and destinations. Most exporters undertook adjustments such as finding new export markets, changing the pricing currency of exports, and making greater use of various instruments to manage their exchange rate risk.

From an assessment of the economy in the second half of 2007, the MPC viewed that the growth momentum of the Thai economy would continue from the better-than-expected recovery in private demand. However, the recovery in private demand going forward was still prone to risks, as consumers and investors remained cautious about higher oil prices, clarity in the political situation, and continuity of government policies in the upcoming period.

Overall, the MPC assessed that private demand would play a greater role in driving the economy in 2008, compared to 2007. While oil prices, which steadied at a high level, would reduce consumers' purchasing power and increase the cost of production to a certain extent going forward, it was unlikely to interrupt the economic recovery. In line with expectations in the previous *Report,* export growth was expected to continue to decelerate, albeit at a slightly faster-than-expected pace, given the larger-than-expected slowdown in trading partners' economies. The slowdown was particularly apparent in the case of the US economy, given persistent problems in the subprime mortgage market. In addition, the Thai baht continued to strengthen in line with regional currencies, given the expected decline in the value of the US dollar as the US economy decelerated. Considering the outlook for both domestic demand and external demand, the MPC deemed that the Thai economy would grow at a faster pace in 2008 compared to 2007. Strengthened domestic demand would result in greater balance in the drivers of growth between private demand, public demand, and external demand, compared to 2007, which saw external demand as the main driver a growth in an environment of sluggish domestic demand.

In 2009, the Thai economy was expected to grow at a similar rate to 2008, with acceleration in private investment being an important driver of the economy, particularly given the massive amount of capital required for large investment projects such as the production of "Eco-cars". This was in line with investment indicators including the rise in the value of projects approved by the Board of Investment (BOI).

In addition, the recovery of trading partners' economies in 2009 would help drive exports. However, the performance of both investment and exports would depend on the import of capital goods and raw materials. Therefore, the acceleration of investment and exports would lead to a marked rise in imports in 2008 as well.

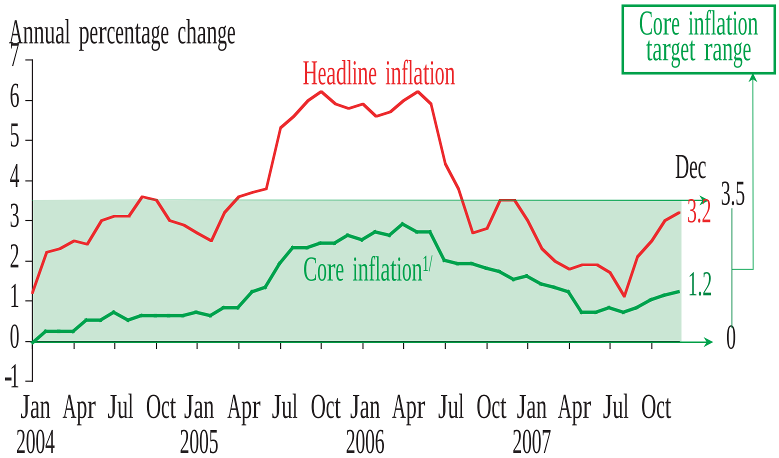
The assessment of economic conditions and preliminary forecasts led the MPC to adjust its baseline growth projections for the remainder of 2007 slightly upward to reflect actual data up to 2007 Q3. The adjustment also pointed to a better-than-expected performance in domestic demand than initially forecasted by the MPC. Overall, the MPC viewed that economic growth in 2007 would register at about 4.8 per cent, touching the upper bound of the forecast range published in the previous *Report* of 4.3-4.8 per cent. For 2008, the MPC maintained the forecast GDP growth range of 4.5-6 per cent, with the fan chart skewed downward. This was similar to the previous forecast, which reflected more negative risks compared to positive risks, from higher oil prices and the slowdown in trading partners' economies. As for 2009, the range for the growth forecast registered at 4.5-6 per cent as in the preceding year.

The deterioration in economic conditions in the first half of 2007 prior to the recovery in 2007 Q3 did not significantly damage the financial position of businesses and households. In the commercial banking system, while the ratio of non-performing loans increased slightly in 2007 Q3, banks' capital stood at a high level compared to international standards and their ability to generate profits remained satisfactory. In addition, commercial banks remained prudent in their credit extension, which contributed to sluggish credit growth in the previous period, particularly to the business sector. However, there were signs of an improvement in these types of credits, in line with the likelihood of a recovery in private investment.

Inflationary outlook and monetary policy

In 2007 Q4, inflation accelerated as a result of higher world oil and commodity prices and the greater pass-through to prices of goods and services. This came about partly as price administration measures were relaxed, allowing the prices of goods and services that were

Chart 1.1 Consumer price index

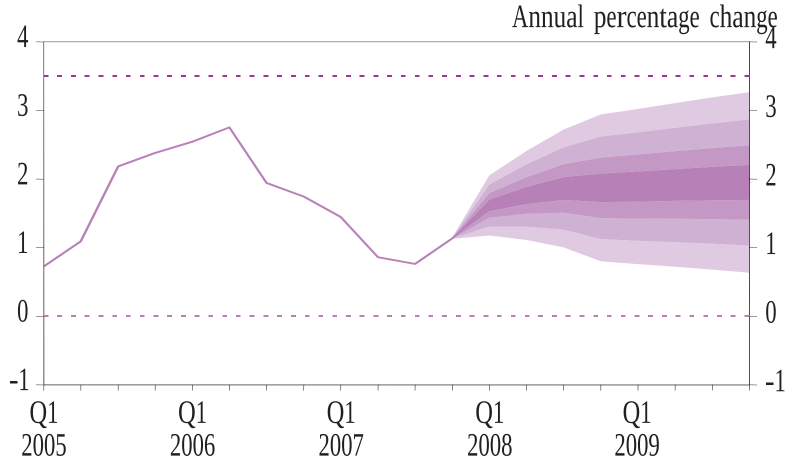


Note: [1/]Consumer price index excluding raw food and energy items
Source: Trade and Economic Index Bureau, Ministry of Commerce

previously capped to rise, given an actual rise in costs of production. In addition, producers had absorbed the burden of higher costs for some time now. However, authorities remained cautious that any price adjustments would affect consumers' purchasing power, resulting in only a gradual pass-through into higher prices for goods and services under price administration.

Headline inflation towards the end of the year accelerated by more than the MPC expected. As a result, headline inflation in 2007 averaged at 2.3 per cent per annum, just within the upper bound of the forecast for headline inflation in the previous *Report* of 1.8-2.3 per cent per annum. Core inflation, however, averaged at 1.1 per cent in 2007, in line with the MPC's projection. Going forward, supply-side factors should contribute to acceleration in headline inflation, particularly in 2008 Q1, as a result of a low base in the same period in 2007. In addition, the MPC projected that there would be increased pass-through into the prices of goods and services, especially as the recovery in domestic demand became clearer. Demand side pressures would in turn allow producers to raise the prices of goods and services more easily. Therefore, the MPC adjusted the forecast range for headline inflation upward for 2008 to 2.8-4 per cent, moderating to 1.8-3.3 per cent in 2009 in line with the expected decline in oil prices. The fan chart for headline inflation, however, was skewed upward throughout the upcoming 2-year period, reflecting upside risks which exceeded downside risks,

Chart 1.2 Core inflation forecast



Note: The fan chart covers 90 per cent of the probability distribution

particularly due to oil prices. The forecast range for core inflation was adjusted upward to 1.3-2.3 per cent in 2008, and trended upward to a range of 1.5-2.5 per cent in 2009, given the delay in pass-through of higher costs. The chance that this pass-through could be greater than expected resulted in a fan chart which was skewed upward, throughout the entire forecast range.

Compared to the previous period, the MPC assessed that there was an improvement in the momentum of economic growth as a result of more robust private domestic demand, which increased by more than expected in the second half of 2007. But going forward, the risk to economic growth remained similar to previous projections, while the risks to inflation increased. However, the likelihood that core inflation would accelerate beyond the target range remained low, partly due to the fact that the economic recovery was still in a nascent stage. The MPC judged that the situation would need to be monitored going forward, and decided to maintain the policy interest rate at 3.25 per cent per annum at the meetings on 4 December 2007 and 16 January 2008.

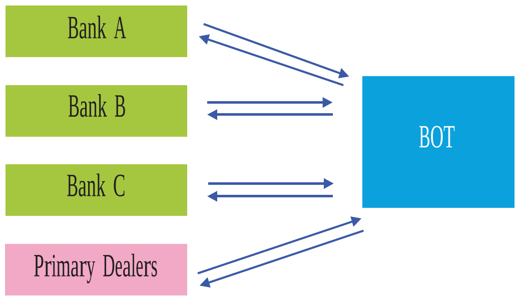
In addition, the MPC approved the use of the 1-day bilateral repurchase rate as the new policy interest rate in place of the current 1-day repurchase rate, effective once the closure of the BOT-operated repurchase market took place, in accordance with the BOT monetary policy operation framework reform plan (see box for further details).

Closure of the BOT RP market

On 29 November 2007 the Bank of Thailand (BOT) officially announced that the last day of operation of the BOT-operated repurchase (BOT RP) market would be 12 February 2008. The closure of the BOT RP market constituted the second phase of the BOT monetary policy operation framework reform plan, the first phase of which had been implemented since 17 January 2007. The first phase involved (1) a switch in the monetary policy operating target (the policy rate) from the 14-day repurchase rate to the 1-day repurchase rate, (2) synchronizing reserve maintenance periods with MPC dates, and (3) establishing an interest rate corridor to limit interest rate volatility (further details on the reform of BOT monetary policy operation framework can be found in the January 2007 *Inflation Report).*

About the BOT RP Market

Chart 1 Transactions in BOT RP market
where the BOT acts as the central counterparty

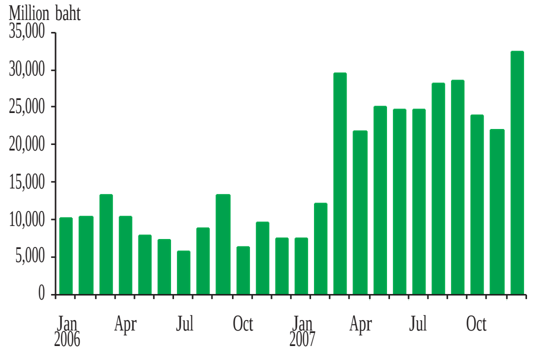


The BOT had played the role of a principal broker in the BOT RP market since it was first established in March 1979, acting as a matchmaker between financial institutions that were borrowers and lenders (Chart 1). Acting as the central counterparty to all transactions caused financial institutions to rely primarily on the BOT RP market as their main channel for short-term liquidity management, as the counterparty risk between borrowers and lenders was eliminated. However, changes in the financial environment and various standards and practices over the years had made certain practices in the BOT RP market inappropriate, as they failed to support proper functioning of the market mechanism and acted as obstacles to development of the money and bond markets. The BOT had therefore gradually phased out the role of the BOT RP market since June 2004, starting with a reduction in the frequency of BOT RP operating sessions from two to one per day. Moreover, to help market participants familiarize themselves with private repurchase (private repo) transactions and ensure that they were ready to transact privately instead of relying on the BOT RP market, the BOT had made some adjustment to be in line with internationally accepted standards, such as marking-to-market of collateral and taking an initial haircut.

Readiness for the closure of the BOT RP market

The BOT had prepared itself and market participants to ensure that the closure of the BOT RP market go smoothly and to facilitate money market development and proper functioning of the market mechanism. The important steps undertaken were:

Chart 2 Transaction volume in the private repurchase market



Source: Thai Bond Market Association

1. Promotion of alternate liquidity management channels other than the BOT RP market to ensure that financial institutions would be able to manage their liquidity efficiently through other markets, such as (1) hosting educational seminars for market participants on the private repo market and the Global Master Repurchase Agreement (GMRA), and (2) coordinating with the ACI Thailand Club to set up a standard Annex to the GMRA, which would help individual companies save on legal fees. Chart 2 shows the significant increase in transaction volume of private repo operations, reflecting the market's readiness for the closure of the BOT RP market.

In addition, the BOT had been coordinating with the Financial Institutions Development Fund (FIDF), the largest borrower in the BOT RP market, to find other sources of financing. And as a result of long-term bond issuance to investors including the issuance of the 2- and 4-year saving bonds in November 2007, the FIDF's reliance on the BOT RP market had been reduced substantially. Furthermore, it was expected that the FIDF would be able to end its need to seek financing through the BOT RP market prior to the closure of the BOT RP market in February 2008.

2. Phasing out the BOT RP market by increasing the principal brokerage fee in the BOT RP market from 3 to 6 basis points per annum and increasing the minimum amount per transaction from 10 to 300 million baht in order to discourage financial institutions from entering the BOT RP market and encourage them to seek financing through alternative channels.

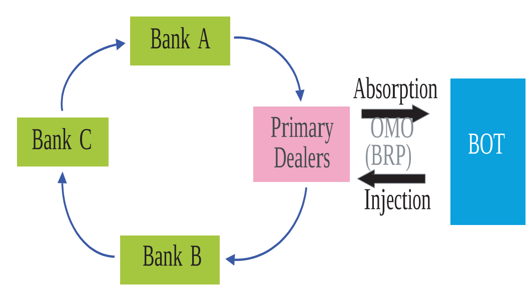
3. Enhancing the BOT's effectiveness in managing liquidity through other channels in order to maintain the policy interest rate as determined by the MPC. The reform of the monetary policy operation framework undertaken since 17 January 2007 had resulted in more efficient open market operations. Moreover, since 2007 the BOT had gradually increased its operations through bilateral repurchase (BRP)[1/] transactions, as reflected in the increase in the ratio of BRP transactions to the BOT's total repurchase transactions (BRP + BOT RP) from just 40 per cent in 2006 to around 85 per cent towards the end of 2007. Part of this achievement could be explained by the addition of 5 primary dealers, resulting in a total of 14 members since October 2007. In other words, the BOT's transactions through the BRP almost replaced BOT RP transactions. This would help facilitate the BOT's liquidity management both in normal and emergency situations, and especially in the period immediately following the closure of the BOT RP market.

Effects of the closure of the BOT RP market on monetary policy operations

1. Monetary policy signaling instrument (policy interest rate). The closure of the BOT RP market would result in a change of the reference rate from the 1-day (BOT) repurchase rate to 1-day BRP rate. Should the BOT wish to borrow or lend in the 1-day BRP tenor, the BOT would do so only at the policy rate (fixed-rate tender).

2. Liquidity management in the money market. The aforementioned preparations for the closure of the BOT RP market would enhance the effectiveness of the BOT in managing liquidity to maintain the policy rate. Financial institutions would need to find ways to manage liquidity among themselves while the BOT would oversee and manage liquidity in the financial system as a whole by increasing transactions with PDs through Open Market Operations (Chart 3). This would support more in-depth money market development and a better functioning of market mechanism as well as indirectly enhance the monetary policy transmission mechanism.

Chart 3 BOT's monetary policy operation through BRP after the closure of the BOT RP market



To conclude, preparations undertaken to support the closure of the BOT RP market in the previous periods[2/] and going forward should facilitate market participants in the smooth transition after the closure of the BOT RP market, although financial institutions could be affected somewhat in the period immediately following the closure. Nevertheless, according to the plan, the reform of the monetary policy operation framework should be completed by February 2008. The reform would lay a strong foundation for a transparent monetary policy operation framework in accordance with well functioning market mechanism while promoting further development of the Thai financial market in the future.

[1/] The BRP operation, whice began in 2000, was only transacted with Primary Dealers (PDs) who were responsible for transferring liquidity on behalf of the BOT to the financial system. The BOT's objective for conducting dual operations, the BRP and the BOT RP was to stimulate and develop the private repurohase market.

[2/] Recent market survey showed that all financial institutions had found alternative channels to manage liquidity in place of the BOT RP market but the effectiveness in liquidity transfers could be limited, especially when the Special Business Tax was still at 3 percent and the tax was imposed each time liquidity was transferred.

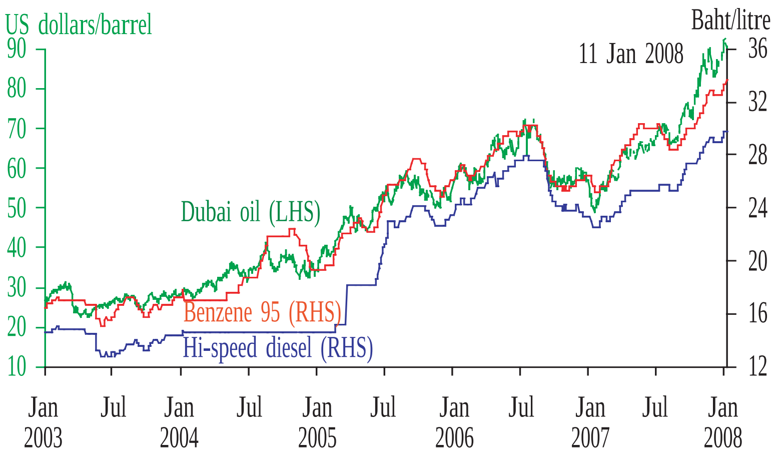
2. Recent Developments in Inflation and Economic Conditions

Inflation trends

The effect of rising world oil prices in 2007 Q4 passed on to domestic energy prices and public transportation fares.

World oil prices surged in 2007 Q4, as seen in the average price of Dubai crude oil, which rose to 82.83 US dollars per barrel in 2007 Q4 from 70.00 US dollars per barrel in the previous quarter. Various factors accounted for this surge. They included (1) higher global oil demand, especially from China and India, which grew at a rate at which supply expansion could not manage to keep pace. Some of the factors constraining oil supply expansion during this quarter were the maintenance shutdowns of a number of oil refineries, natural disasters that lowered production along with domestic political factors within the oil producing countries in the Middle East as well as in Africa; and (2) lower confidence in the US economy and the weakening of the US dollar, which caused investors to increasingly diversify their holdings of financial assets into commodities such as oil and gold, which translated into higher speculative activities in the futures market for oil.

Chart 2.1 Dubai oil price and domestic retail oil prices



Source: PTT Public Company Limited

Higher world oil prices put pressure on domestic retail oil prices and consequently, gasoline and diesel prices edged higher than the previous quarter. The average prices of ULG 95 and high-speed diesel rose from 29.26 and 25.87 baht per litre in 2007 Q3 to 31.66 and 28.44 baht per litre this quarter, respectively. Higher prices of oil and other commodities used as inputs in the production of goods caused the producer price index to rise by 7 per cent year-on-year in 2007 Q4, a substantially quicker pace of increase than the 1.5 per cent observed in the previous quarter.

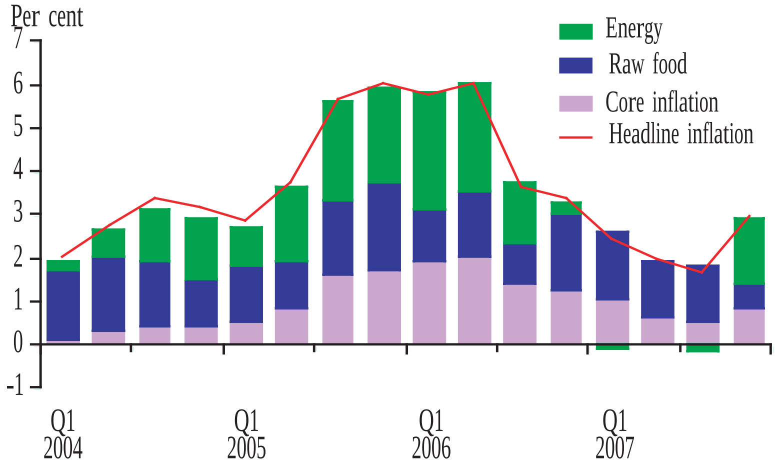
The said acceleration in costs of energy and raw material started to pass through to prices of goods and services in the consumer price

Table 2.1 Quarterly inflation

Unit: Per cent	2006	2007	2007 Q1	2007 Q2	2007 Q3	2007 Q4
Percentage change from the previous year (%Δyoy)						
- Headline consumer price index	4.7	2.3	2.4	1.9	1.6	2.9
• Core consumer price index	2.3	1.1	1.4	0.9	0.8	1.1
• Raw food	7.5	6.5	8.9	7.2	7.4	3.2
• Energy	15.0	2.4	-1.0	-0.2	-1.4	12.7
- Producer price index	7.0	3.3	2.6	1.8	1.5	7.0
Percentage change from the previous quarter (%Δqoq)						
- Headline consumer price index	-	-	-0.4	1.8	0.1	1.4
• Core consumer price index	-	-	0.1	0.3	0.2	0.5
• Raw food	-	-	-2.6	4.1	0.0	1.7
• Energy	-	-	-0.2	7.1	-0.2	5.7
- Producer price index	-	-	0.5	4.3	-1.8	3.9

Source: Trade and Economic Index Bureau, Ministry of Commerce

Chart 2.2 Contribution to headline inflation



Source: Trade and Economic Index Bureau, Ministry of Commerce index; for example, various public transportation fares and other consumer products, notably in the food and vehicles categories, were revised upward throughout the quarter. Nevertheless, the pressure on headline inflation was partially eased with the slowdown in raw food price increases, as vegetables and fruits production benefited from desirable weather conditions. Overall headline inflation climbed to 2.9 per cent in this quarter from 1.6 per cent in 2007 Q3.

Core inflation picked up as more and more costs of production were passed on to consumers.

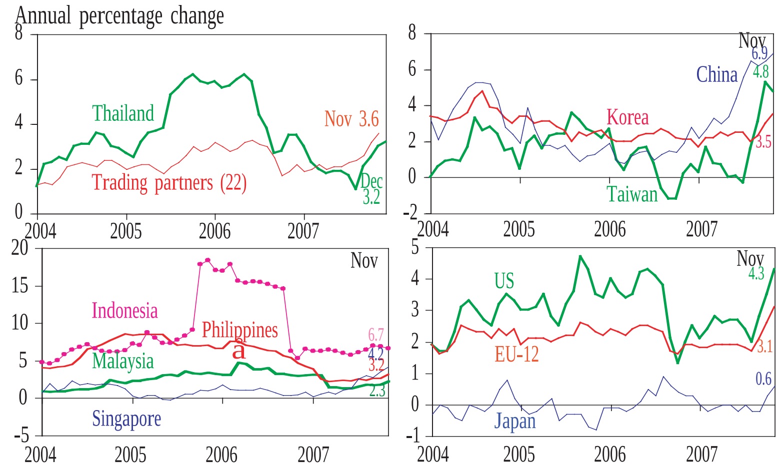
Core inflation also picked up from the previous quarter, registering at 1.1 per cent this quarter, mainly on account of upward drifts in public transportation fares on the back of high-speed diesel price increases, as well as the aforementioned pass-through of higher cost of production to consumers. Nevertheless, the gradual pass-through of higher cost to consumer prices resulted from a moderate pace of domestic demand recovery coupled with active price controls of goods and services, which though relaxed somewhat still placed emphasis on the effects of consumer price increases on the general public.

As with the case of Thailand, headline inflation in other Asian and industrialized countries also trended upward, as a result of accelerated prices of major commodities, such as oil, base metals and food.

For countries in the Asian region, contribution from food prices to inflation was quite high as food had a large weight in their consumer price indexes. As governments in many countries continued to temper the rise in oil prices through subsidies, effects of oil prices on inflation were not as apparent as those of food prices. For instance, China's headline inflation was 6.9 per cent in November 2007, but excluding food items, which had a weight of 33.2 per cent, overall prices rose by only 1.4 per cent. In the case of Indonesia, headline inflation with and without food and beverage prices in November 2007 were 6.7 and 5.1 per cent, respectively.

For industrialized countries, inflation in the US accelerated markedly to 4.3 per cent in November 2007 on the back of firmer oil prices while the euro area's HICP also recorded higher at 3.1 per cent. Inflation in Japan was still quite low, and gradually picked up from rising oil and food prices.

Chart 2.3 Inflation in Thailand and other countries



Source: Various official sources and Bloomberg

Aggregate demand in 2007 Q3 [1/]

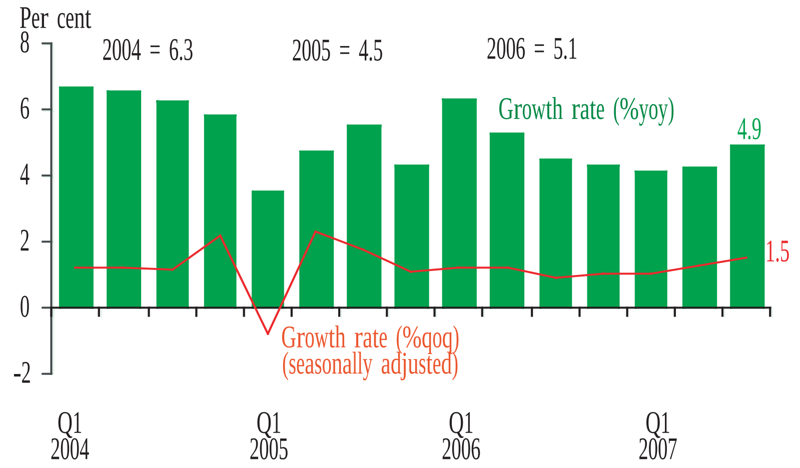
Despite softer export growth in 2007 Q3, the Thai economy grew by 4.9 per cent as domestic demand showed promising signs of recovery.

The Thai economy grew by 4.9 per cent year-on-year in 2007 Q3, a quickened pace compared to the previous two quarters. There were also clearer signs that domestic demand, both through private consumption and investment, had started to recover and helped compensate for the slowdown in exports, as reflected in the contribution to GDP from consumption, investment and net exports of 2.1, 0.6 and 1.2 per cent, respectively.

On a seasonally adjusted basis, the Thai economy grew by 1.5 per cent quarter-on-quarter in 2007 Q3, displaying a progressive growth momentum from 1.0 and 1.3 per cent quarter-on-quarter growth in 2007 Q1 and 2007 Q2, respectively.

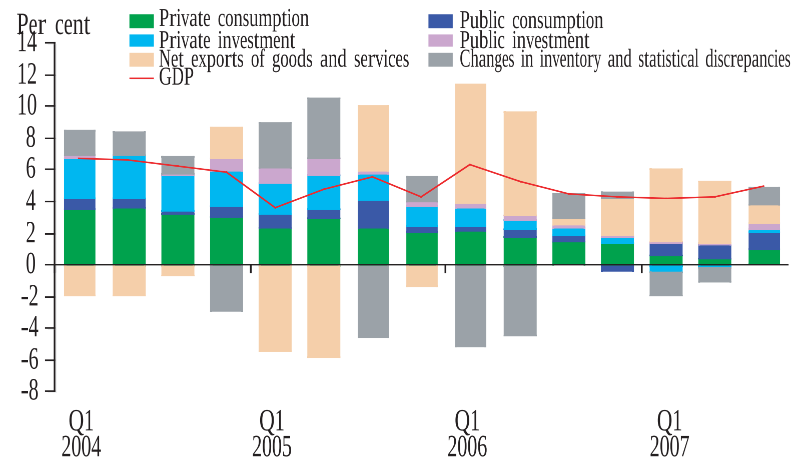
[1/] Data used to analyse aggregate demand in 2007 Q3 was obtained from the NESDB. Economic indicators used for analysing 2007 Q3 and the outlook for 2007 Q4 were obtained from the BOT, except for the Consumer Confidence Index, which was produced by the University of the Thai Chamber of Commerce, and data on government expenditure, which originated from the Comptroller General's Department and was compiled by the Fiscal Policy Office.

Chart 2.4 Real GDP growth at 1988 prices



Source: National Economic and Social Development Board

Chart 2.5 Contribution to GDP growth

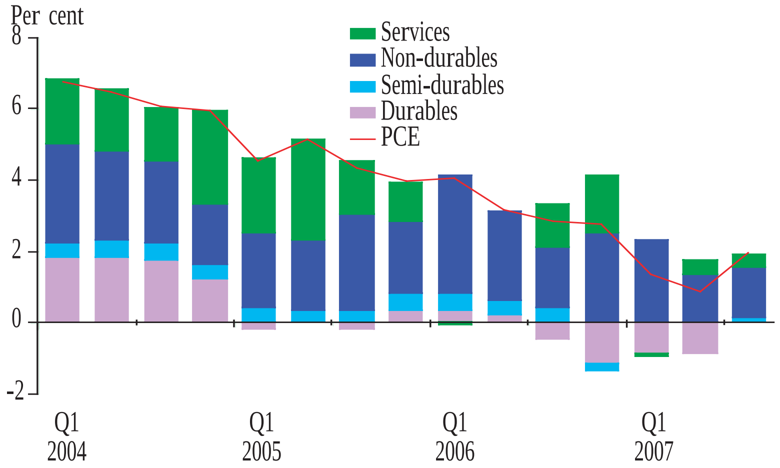


Source: National Economic and Social Development Board

Upturns in 2007 Q3, both in private consumption and private investment, together with increases in businesses confidence, all pointed towards domestic demand recovery.

A closer inspection of aggregate demand components in 2007 Q3 showed that private consumption grew at 1.9 per cent and accelerated for the first time since 2006 Q2. This acceleration was due to the first expansion in durable goods consumption following four quarters of contraction. Meanwhile, the growth of semi-durable and non-durable goods consumption edged up slightly from the previous quarter. The pickup in private consumption growth translated into a rise in its contribution to GDP growth to 1.0 per cent from 0.5 per cent in the previous quarter. On the other hand, the moderate gain did not indicate a firm recovery. Consumer confidence continued to be dented as reflected in a decline in the consumer confidence index (CCI) from 77.1 in the previous quarter to 75.8 in this quarter.

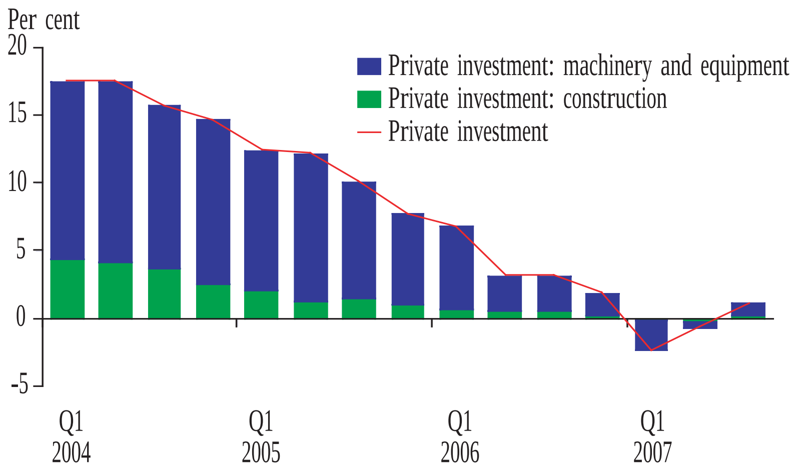
Chart 2.6 Contribution to PCE growth



Source: National Economic and Social Development Board

Private investment expanded by 1.1 per cent in 2007 Q3 on the back of machinery and equipment as well as construction investment. The expansion in this quarter followed two quarters of contraction at -2.3 and -0.7 per cent in 2007 Q1 and 2007 Q2, respectively. A major factor behind the pickup in private investment included gradual improvement in business confidence, which was in line with improvement

Chart 2.7 Contribution to private investment growth



Source: National Economic and Social Development Board in private consumption, and which reflected firmer confidence on the part of the business sector in the political prospects following the announcement of the general election date in the beginning of August. As an indication of this improvement, the Business Sentiment Index (BSI) rose from 42.1 in 2007 Q2 to 42.9 this quarter.

In 2007 Q3, government expenditure expanded with disbursement rate well on target while investment from state enterprises accelerated

Public expenditure was on an upswing during the last quarter of fiscal year 2007 (calendar year 2007 Q3) owing mainly to effective budget disbursement, which met the target set previously at 26 per cent of the entire annual budget. Public consumption grew by 9.8 per cent year-on-year while public investment growth accelerated from 2.7 to 5.8 per cent. Additional stimulus came largely from higher state enterprise investment. Consequently, government spending continued to play an active role in supporting the Thai economy, with public consumption and public investment contributing 1.0 and 0.4 per cent to GDP growth, respectively, reaching a two-fiscal-year peak in terms of contribution this quarter.

Exports in 2007 Q3 slowed down from lower agricultural production.

While domestic demand showed signs of recovery, exports lost its momentum somewhat. The volume of exports of goods and services in 2007 Q3 expanded at a softer rate of 3.5 per cent year-on-year compared to 8.2 and 7.6 per cent in 2007 Q1 and 2007 Q2, respectively, owing to markedly slower export of agricultural products, as major crops production fell. Growth of manufacturing exports also weakened in line with regional developments, affected as they were by lower demand from major economies.

Imports, on the other hand, accelerated by 2.4 per cent mainly from capital goods, which were previously subdued, as well as raw materials used in production for future exports. Rising import growth, coupled with a decline in export growth lowered net exports' contribution to GDP growth to 1.2 per cent for this quarter from 4.5 and 3.9 per cent in 2007 Q1 and 2007 Q2, respectively.

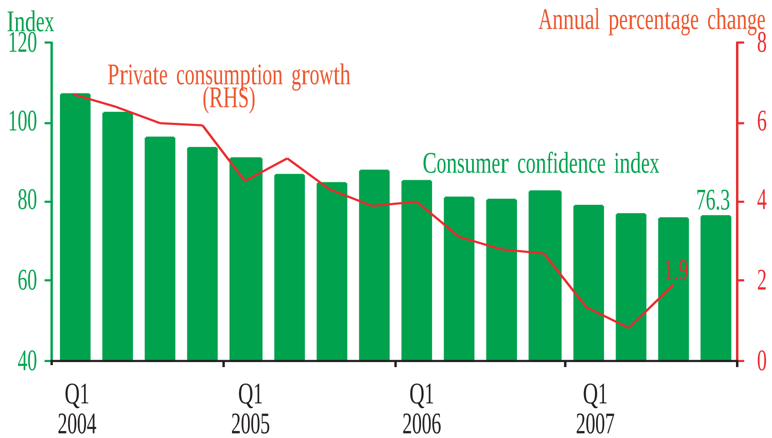
Trend of aggregate demand in 2007 Q4

In 2007 Q4, Thailand's economy continued to show an improving trend both from domestic and external demand, the latter of which was more favourable than expected, allowing exports to retain the role of an important growth engine.

Private consumption and private investment in 2007 Q4 displayed an improving trend.

Economic indicators of private consumption and private investment compiled by the Bank of Thailand continued to show signs of improvement. The Private Consumption Index (PCI) for October and November averaged at 123.2, edging up from 122.1 in 2007 Q3, and expanding from the same period last year from markedly higher imports of consumer goods and better value added tax revenue. A moderate improvement in the political outlook contributed to the firming up of consumer confidence at the onset of the New Year festival, with the consumer confidence index rising from 75.8 in 2007 Q3 to 76.3 in 2007 Q4. Nevertheless, energy-related spending of the private sector started to slow down in October and contracted in November, as a consequence of higher oil prices. Energy prices continued to be an important factor holding back consumption. In this light, the MPC assessed that if consumer confidence continued to strengthen, the recovery of private consumption would become more apparent.

Chart 2.8 Consumer confidence index and private consumption growth

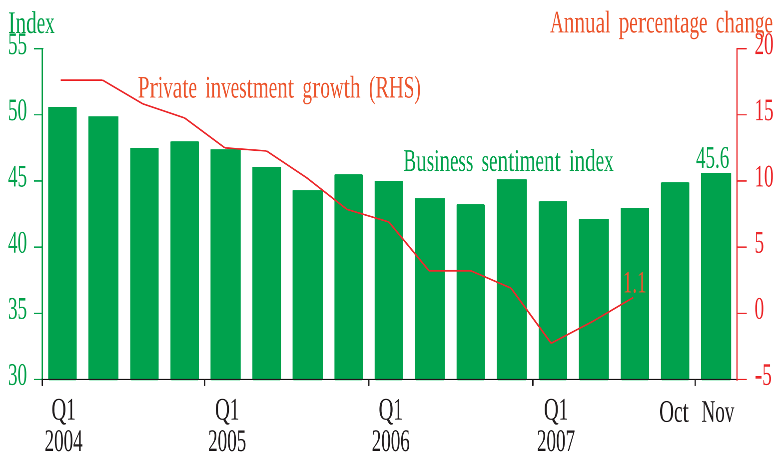


Source: The University of the Thai Chamber of Commerce and National Economic and Social Development Board

Private investment in 2007 Q4 also showed signs of gradual recovery. The Private Investment Index (PII) picked up from 174.6 in 2007 Q3 to average at 176.8 for October and November on account of the acceleration in imports of capital goods and domestic sales of machinery. In addition, sales of cement shrank by a lesser degree than the previous quarter, signaling an improving trend in construction investment going forward as confidence gradually recovered.

The improvement in private investment conditions was in line with the increase in the Business Sentiment Index (BSI), which jumped from 42.9 in the previous quarter to average at 45.2 in October and November as a result of improving political outlook and consumer demand. An indicator of business sentiment related to the costs of production declined progressively, however, reflecting concerns over rising production costs, a negative factor confronting firms in the periods ahead.

Chart 2.9 Business sentiment index and private investment growth



Source: Bank of Thailand and National Economic and Social Development Board

Both government revenues and expenditure accelerated from the previous quarter.

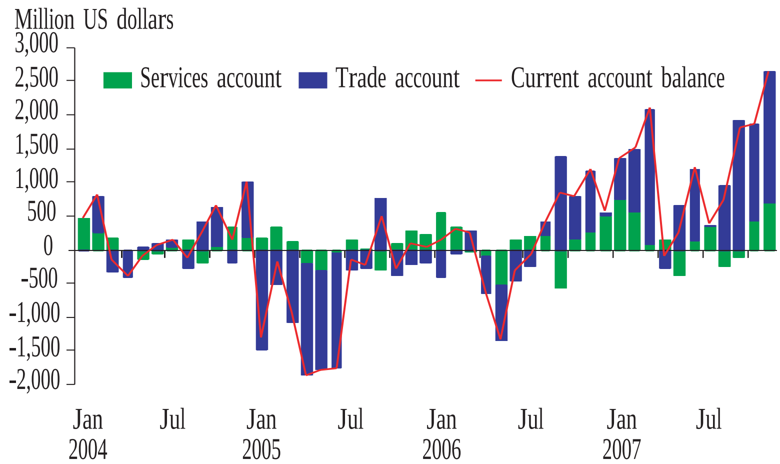
On the fiscal side, government revenue collection during fiscal year 2008 Q1 (calendar year 2007 Q4) surged substantially. The average revenue collection for October and November grew by 16.0 per cent year-on-year. The jump in revenue growth was partly due to higher excise tax rates levied on alcohol and tobacco, effective from 28 August 2007, a one-off factor. Revenue from value added tax from imports and domestic spending components also expanded, pointing to a stronger recovery of private sector economic activities.

Government expenditure surged by 41.0 per cent during the first two months of 2007 Q4. The abnormal growth was due to the delay in the passage of the Budget Expenditure Act of the previous fiscal year. At the same time, a higher target of budget disbursement rate for fiscal year 2008 also contributed to the vigorous growth, which reflected the attempt of the public sector to continue its economic stimulus into calendar year 2008.

In 2007 Q4, exports performed well beyond expectation, while imports picked up as domestic demand gradually recovered.

On the external front, exports remained robust in 2007 Q4 and expanded well above the MPC's expectation in the previous *Report.* Despite the appreciating trend of the baht, exporters were able to diversify to new markets, and were somewhat able to switch away from the US dollar as invoice currency as well as use financial instruments more actively to hedge the currency risk (see box for further details). As a result, export growth for October and November averaged at 16.0 per cent year-on-year, mainly from electronic products, machinery used in the energy industry and agricultural products, which recovered from production difficulties during the previous quarter.

Chart 2.10 Current account balance



Source: Bank of Thailand

Imports in 2007 Q4 also appeared to be on an accelerating path. Import volume grew at an average rate of 9.1 per cent year-on-year during October and November, mostly from consumer goods, which was in line with rising consumption spending, and imports of raw material used in the production for exports, which still expanded well.

Despite an acceleration in imports, stronger-than-expected export performance resulted in a trade surplus larger than the MPC had earlier assessed. Together with positive quarter-on-quarter growth in services income and transfer from increasing tourist revenue for seasonal reasons, the current account surplus was expected to be larger in 2007 Q4 than it was in 2007 Q3.

The resiliency of Thailand's export sector: An analysis

Thailand's export sector faced a number of challenges in 2007; for instance, intensified competition in product quality and the appreciation of the baht against the US dollar. In spite of these challenges, during the first 11 months of 2007 export continued to expand well with total value in US dollar terms growing at 18 per cent compared to the same period last year. Volume growth alone was 12 per cent in 2007, reflecting the ability to compete and adjust to new environment.

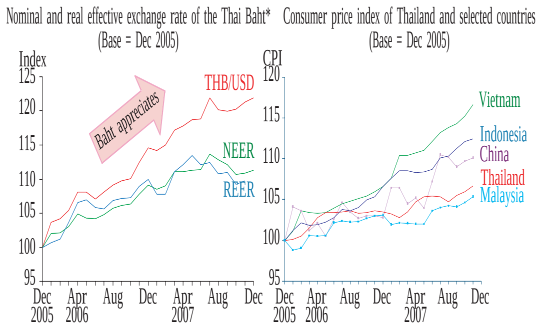
This article provides an analysis of the resiliency of the Thai export sector in terms of price competitiveness and the ability to adjust to new challenges.

1. Price competitiveness The rapid appreciation of the Thai baht vis-à-vis the US dollar set off a widespread concern about the price competitiveness of Thai export products. But equating degree of price competitiveness with the exchange value of the baht against one currency could be misleading. As the baht appreciated against the US dollar, the currencies of Thailand's export competitors also moved in the same direction. Considered in terms of the nominal effective exchange rate (NEER), Thailand's export price competitiveness was not diminished by much. Furthermore, inflation in some competitor countries such as China and Vietnam had recently been higher than Thailand's inflation, indicating that their cost of production could be pushed up at a faster rate than it had been in Thailand. Indeed, taking into account relative inflation rates, the movement of the baht's real effective exchange rate (REER) indicated that the Thai baht had not effectively appreciated against the currencies of other export competitors in real terms.[1/] In other words, Thailand's real export price did not rise; and hence its ability to compete based on price had not been eroded.

2. Ability to adjust through product, market and currency diversification. The structure of Thai exports were quite well-diversified in the following ways:

• Product diversification: Overall, Thai exports spanned across a wide spectrum of products, from agriculture and fishery to industrial goods, which had over the years seen a structural shift from labor-intensive products (e.g., shoes, leather, and textiles) towards high technology products (e.g., computers, integrated circuits and automobiles). The prevailing structure of Thailand's export exhibited a high degree of diversification, as measured by the Export-Commodity Concentration Index, which

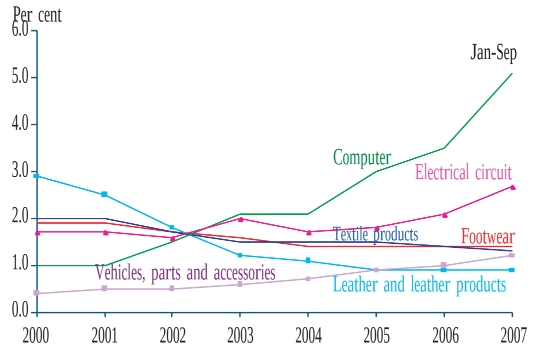
Chart 1 Effective exchange rates and consumer price index of Thailand and its competitors



Note: *The indexes reflect the movement of the Thai baht in relative to the currency basket, which includes currencies of nine major trading partners or export competitors: China, Hong Kong SAR, Taiwan, South Korea, Indonesia, Philippines, Malaysia, Singapore, and Vietnam. Weight used for each currency is export weight, calculated based on trade statistics data from *Direction of Trade Year 2006* . (Details of index calculation is appeared in *Inflation Report,* January 2005)

Source: Bank of Thailand, Bureau of Trade and Economic Indices, and Bloomberg

Chart 2 Share of the Thai exports in international markets



Note: Data from January to September 2007 are preliminary
Source: Global Trade Atlas

[1/] To measure the degree of price competitiveness as embodied in the exchange value of the currency, the baht should be compared against various currencies of Thailand's trading partners and competitors, i.e. the nominal effective exchange rate (NEER) should be used for such comparison. For a better assessment of price competitiveness, the relative cost of production should also be considered. The real effective exchange rate of the baht (REER), calculated by deflating NEER by consumer price index of each country, reflects the effective price of the baht in real terms against its trading partners and competitors.

registered at 0.193.[2/] Export product diversification helped enhance the flexibility of the export sector in the competition for the world markets, particular against low-wage countries.

• Market diversification: Thai exporters had been active in finding new markets for their products and selling to a wider range of markets, particularly the Middle East, India, and new EU member countries.[3/] These markets had been growing rapidly during the first 11 months of 2007 (Table 1). Indeed, over the years the Export-Market Concentration Index[4/] for Thailand reflected this change; it declined from 0.299 in 2000 to 0.246 in 2007.

• Export invoice currency diversification: The US dollar had dominated as an invoice currency for Thailand's exports, accounting for 91.7 per cent of export receipts in 1996. Over time, that dominance started to decline. During the first 9 months of 2007, the US dollar accounted for 80.7 per cent of all export receipts. Meanwhile, the baht, yen and euro made gains over this period (Table 2). Such currency diversification away from the US dollar helped alleviate the impact of the recent fall in the US dollar on export receipts in baht terms and smoothen the variations in overall export revenue.

Table 1 Export growth and share of exports classified by market

Countries	Growth (Per cent)		Share (Per cent)		
	2006	Jan-Nov 2007	2005	2006	Jan-Nov 2007
Japan	8.6	10.6	13.6	12.6	11.9
US	14.4	-2.0	15.3	15.0	12.6
EU	19.2	19.1	13.6	13.9	14.0
: New EU	40.4	60.9	0.7	0.9	1.2
ASEAN	10.8	19.2	22.0	20.8	21.3
Middle East	28.0	30.2	4.0	4.4	4.9
China	27.9	26.4	8.3	9.0	9.6
Hong kong	16.2	21.4	5.6	5.5	5.7
India	18.3	50.0	1.4	1.4	1.8
Australia	37.0	33.3	2.9	3.4	3.8
New Zealand	0.8	22.7	0.5	0.4	0.4
Total	16.9	17.4			

Source: Thai Customs Department

Table 2 Share of export receipts settled in major currencies

Per cent	1996	2001	Jan-Nov 2007
USD	91.7	85.7	80.7
Thai Baht	1.3	4.0	6.7
Japanese Yen	4.5	5.6	6.2
EURO*	n.a.	2.0	3.5
Pound Stirrings	0.4	0.3	0.5
Singapore Dollar	0.4	0.3	0.5
Others	1.7	2.1	1.9
Total	100.0	100.0	100.0

Note: * EURO has been in circulation since 1999.
Source: Thai Customs Department

Better diversification along these dimensions helped reduce the volatility of export receipts from global economic and financial disturbances, product cycle of exports, and loss of competitiveness or market share. Between the periods of 1998-2001 and 2002-2007, the Index of Export Receipt Instability[5/] both in US dollar and in baht terms declined progressively from 0.069 and 0.094 to 0.039 and 0.045, respectively, indicating that yearly Thai export receipts tended to deviate less from its own long-term trend over the past decade and portraying greater stability for Thai export receipts.

In conclusion, Thailand's export sector had been adapting well to the changing environment. Nevertheless, increased competition and global economic and financial fluctuation continued to pose significant risks to Thai exporters. Past success indicated that Thai exporters should keep building capacity to be resilient and competitive through quality improvement of products and services, possibly by adopting higher technology or moving up the value chain, improving production efficiency, marketing and management as well as building product and market networks. The government could also play an important role in helping cultivate new markets for Thai products, developing skills of Thai labor, and investing in basic infrastructure in order to ensure sustainable growth and competitiveness of the export sector.

[2/] Calculate $C = \sqrt{\sum_i (X_i/X)^2}$ where X_i is the export value of good i and X is the total export value for the country; C is a real number between 0 and 1. The export sector is considered to be well diversified in terms of product variety if C is close to 0.

[3/] The new EU countries included Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia.

[4/] The formula of the Export-Market Concentration Index is similar to that of the Export-Commodity Concentration Index, except that in this case, X_i is the value of exports from Thailand to market destination i.

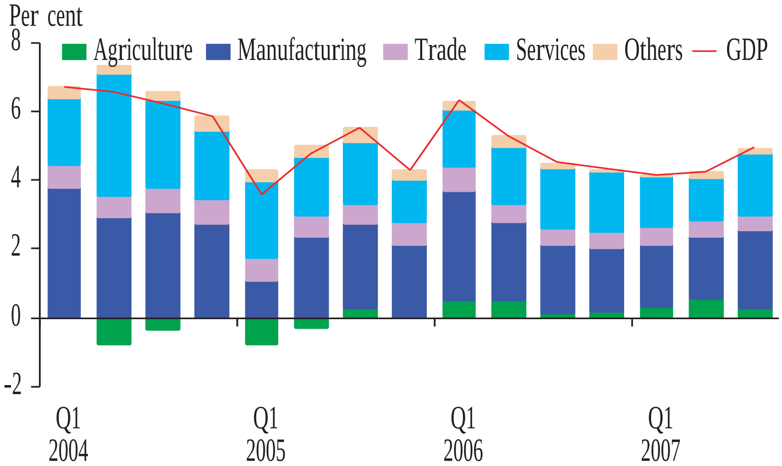
[5/] The index of export receipt instability (I) is calculated as follows: $I = \frac{\sqrt{\frac{\sum (U_t)^2}{N}}}{\bar{Z}}$, $\bar{Z} = \frac{\sum Z_t}{N}$ where u_t is the difference between the actual export receipts (Z) and its trend-value. In this case, the trend of export receipts is estimated by regressing export receipts on a time trend and number of observations (N). The index ranges from 0 and 1. The lower the index value, the more stable is the export receipt.

Production and supply in 2007 Q3 [2/]

In 2007 Q3, agricultural production growth decelerated from the previous quarter, while manufacturing activities accelerated, particularly in export-oriented industries and the service sector.

Production in agricultural sector softened during 2007 Q3, while production in manufacturing and service sectors improved noticeably.

Chart 2.11 Contribution to GDP growth



Source: National Economic and Social Development Board

Agricultural output expanded by 4.0 per cent year-on-year compared to 7.5 per cent in the previous quarter. The growth slowdown came mainly from major crops, especially rubber, which was affected by adverse weather condition accompanying a tropical depression. Growth in production of fishery also weakened. Livestock production picked up as the outbreak of epidemic disease in chicken and pork had subsided.

Manufacturing production grew by 5.8 per cent year-on-year, accelerating from the previous two quarters, mainly from export-oriented industries such as electronics. The growth of domestic-oriented industrial production, though relatively anemic, started to show signs of recovery in line with rising consumer demand.

[2/] Data used to analyse production and supply in 2007 Q3 were obtained mainly from the NESDB. Economic indicators used for analysing 2007 Q3 and the outlook for 2007 Q4 were obtained from the BOT, while data on the number of tourists and occupancy rate was in part compiled by the Tourism Authority of Thailand. Data on the labour market was obtained from the NSO.

Growth in the service sector edged up from 3.7 per cent in 2007 Q2 to 5.3 per cent in 2007 Q3 mainly on the back of rising electricity usage and financial services, which picked up strongly. The hotel sector also improved after a rebound in the number of tourists as public safety concerns abated.

Employment growth was strong in the manufacturing and service sectors during 2007 Q3.

The rate of unemployment remained low at 1.2 per cent throughout the quarter, in line with favourable employment growth of 2.2 per cent year-on-year mainly from manufacturing and services employment. Agricultural employment expanded moderately while employment in the trading sector as well as other sectors such as construction contracted.

Trend in production and supply in 2007 Q4

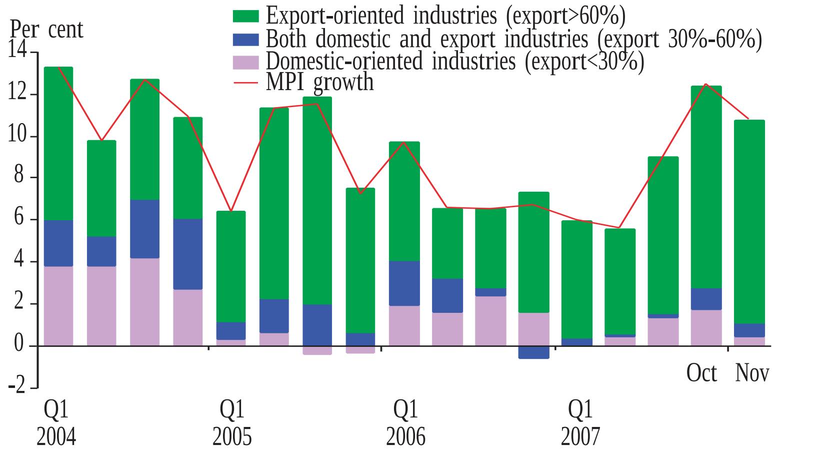
Farm income benefited from favourable prices as well as robust production

Over the months of October and November 2007, crop production shrank on average by 2.5 per cent year-on-year. This contraction was due to abnormally high crop yield during the same period in 2006 following an earlier harvest to avert the potential adverse effect of the flood in that quarter. Nevertheless, the growth of crop production was expected to return to normal again in December and the overall year-on-year growth of 2007 Q4 was expected to be positive. With favourable crop prices on the back of strong external demand, farm income should continue to expand in 2007 Q4.

Manufacturing production continued to accelerate especially in export oriented industry.

Manufacturing production continued to accelerate in 2007 Q4, as indicated by the Manufacturing Production Index for October and November, which expanded by 11.6 per cent year-on-year on average compared to 9.0 per cent during the previous quarter. Industries with exceptional production growth continued to be export-oriented industries, while production of industries that exported between 30-60 per cent of their output, such as passenger cars, edged up noticeably from the previous quarter as a result of external demand and domestic consumption.

Chart 2.12 Contribution to manufacturing production index (MPI) growth

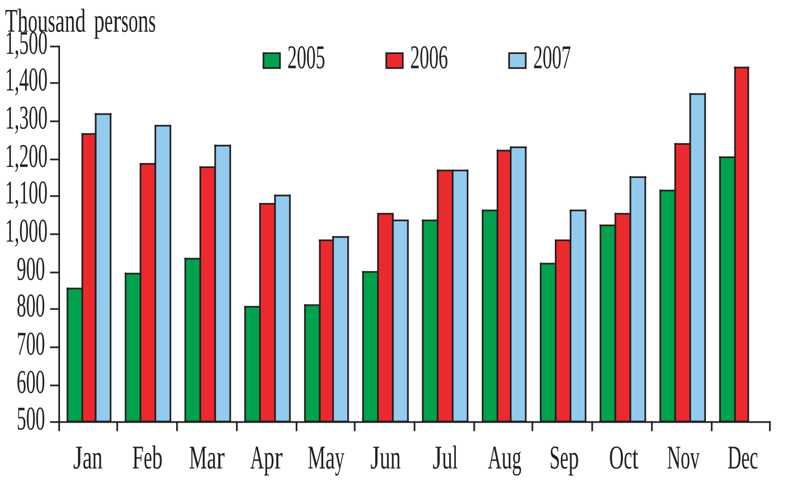


Source: Bank of Thailand

The outlook for tourism in 2007 Q4 improved, following a subdued period since the beginning of the year. Positive factors contributing to the upturn in tourism included the SEA Games 2007 event as well as diminished public safety concerns among tourists. The number of foreign tourists grew on average by 10.0 per cent year-on-year during October and November. However, the occupancy rate was slightly lower than the same period last year.

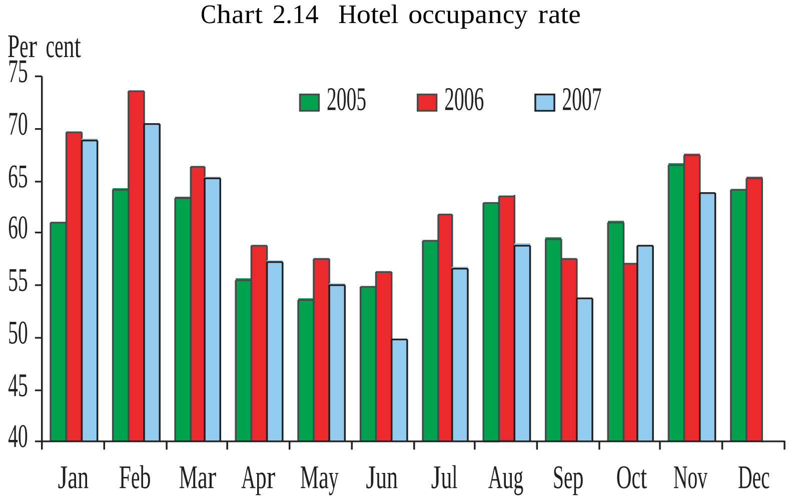
The outlook for tourism displayed a promising trend.

Chart 2.13 Number of tourists



Source: Tourism Authority of Thailand and Bank of Thailand

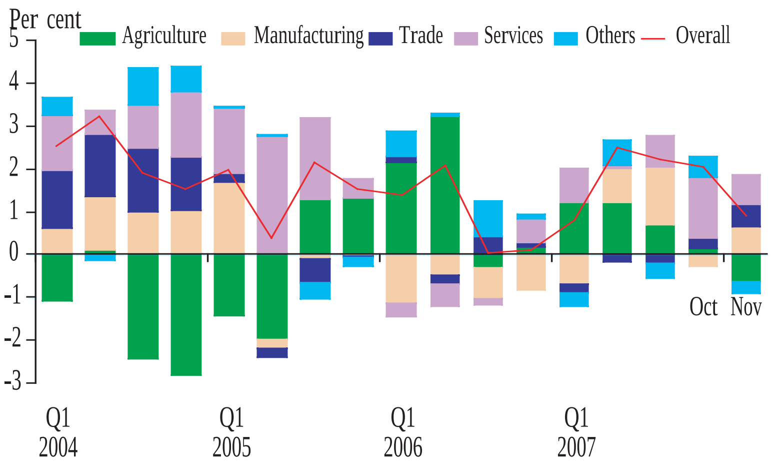
Chart 2.14 Hotel occupancy rate



Source: Tourism Authority of Thailand and Bank of Thailand

As for labour market conditions, employment in October and November expanded at a decelerated pace of 2.0 and 0.9 per cent, respectively, from 2.2 per cent in 2007 Q3. Agricultural employment shrank while employment in the manufacturing, trading and service sectors expanded well. Overall, the unemployment rate remained low at 1.1 per cent in November.

Chart 2.15 Employment growth and sectoral contributions



Source: National Statistical Office

3. Monetary Conditions in the Last 3 Months

Following the release of the previous *Report* in October 2007, the MPC kept the 1-day repurchase rate unchanged at 3.25 per cent per annum at both meetings on 4 December 2007 and 16 January 2008. As a result, monetary conditions were relatively unchanged compared to the previous quarter, both in terms of short-term money market yields as well as commercial bank reference rates.

In both meetings, the MPC deemed that domestic demand continued to recover, while export growth remained robust, but was at risk of moderating in line with the global economy. In addition, the trend in oil prices and the likelihood that the US economy would slow down further as a result of the problems in the subprime market could have repercussions on the Thai economy going forward. With regards to price pressures, headline inflation was expected to accelerate for some time due to higher world oil and commodity prices, while core inflation was likely to rise in line with the recovery in domestic demand and the pass-through from higher costs. However, core inflation was expected to remain within the target range throughout the next 8 quarters. Overall, the growth momentum of the Thai economy improved, but going forward, factors that could pose risks to growth and inflation still remained. In addition, the extent of these risks remained uncertain, and would need to be monitored closely going forward.

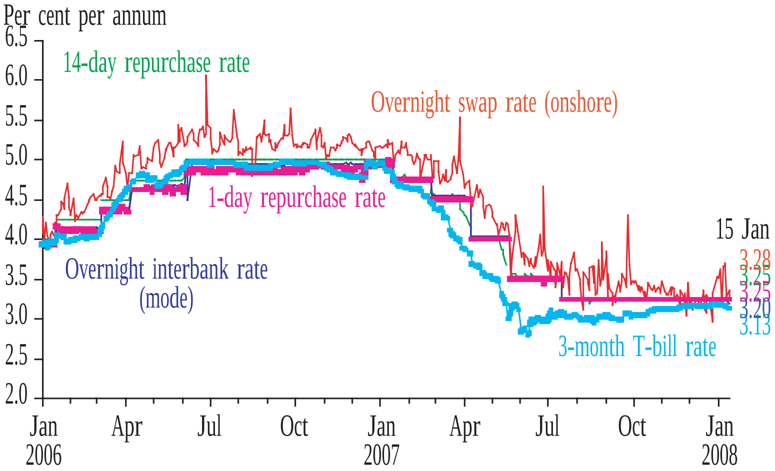
Money market conditions

In 2007 Q4, short-term money market interest rates were unchanged from 2007 Q3, in line with the market's expectations that the policy rate would remain unchanged in the fourth quarter. As a result, both the 1-day repurchase rate and the overnight interbank rate averaged at 3.25 per cent per annum in 2007 Q4.

In 2007 Q4, short-term money market rates were unchanged from the previous quarter, in line with the policy interest rate.

However, overnight swap rates fell in December as a result of market rumours that the Bank of Thailand intended to reduce its operations to drain liquidity through foreign exchange swaps, and increase reliance on issuance of BOT bonds. As a result, overnight swap rates in 2007 Q4 averaged at 3.30 per cent per annum, a decrease from the average in 2007 Q3 at 3.53 per cent per annum.

Chart 3.1 Money market interest rates

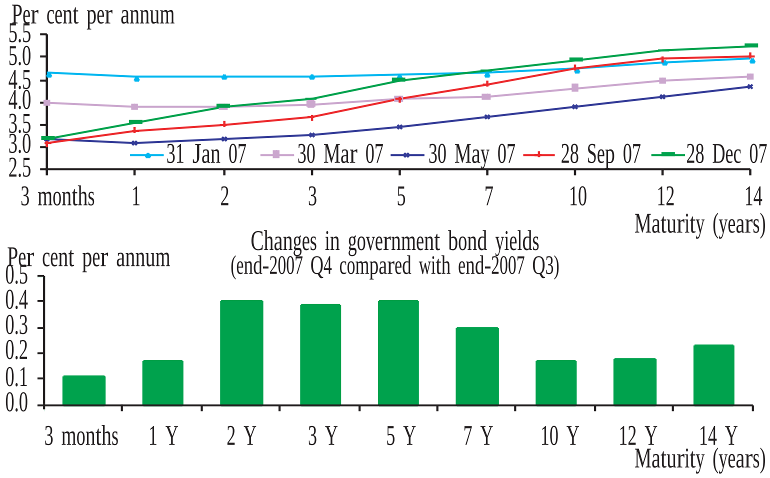


Source: Bank of Thailand

Yields on government bonds increased at all maturities from expectations of higher inflation going forward.

Yields on government bonds in 2007 Q4 increased at all maturities compared to 2007 Q3. In October, government bond yields moved within a narrow range, but rose continuously in November, before subsequently declining in December for all maturities. Bond yields increased in November partly in line with the rise in US bond yields, following the Federal Reserve's signal of increasing concerns over inflationary pressures resulting from the rise in global commodity prices. In addition, domestic investors began to take the view that domestic interest rates could rise in 2008, in response to expectations of higher

Chart 3.2 Government bond yields

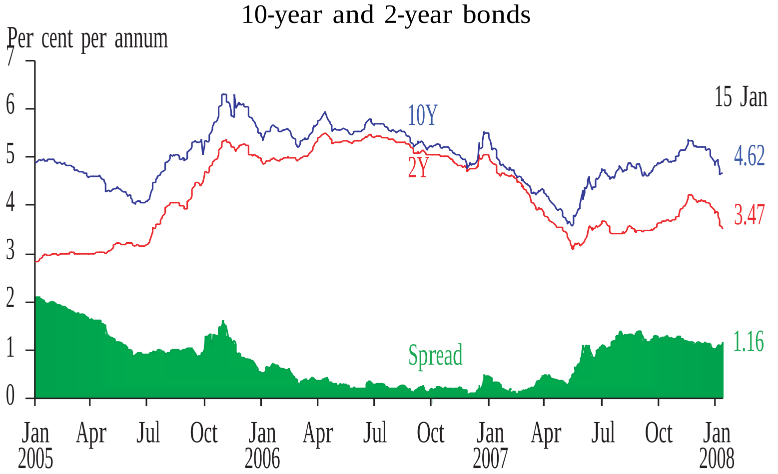


Source: Bank of Thailand

domestic inflation. This led to further expectations that yields would rise going forward, leading to a fall in investment in bonds. In addition, the demand for government bonds fell due to seasonal factors, as investors tended to reduce their investments in bonds towards the year-end. This behaviour was mostly pertinent to institutional investors, most of whom were reluctant to alter their portfolio duration towards the year-end. Overall, these factors led to an upward shift in the yield curve in November, followed by a subsequent downward shift in December, in line with the reduction of the return on interest rate swaps and overnight swap rates.

Overall, bond yields in 2007 Q4 increased at all maturities compared to 2007 Q3, particularly for bonds with maturities between 2-7 years. As a result, the yield spread between 10-year and 2-year government bonds narrowed from 1.27 per cent at end-2007 Q3 to 1.03 per cent at end-2007 Q4.

Chart 3.3 Government bond yield spread between 10-year and 2-year bonds



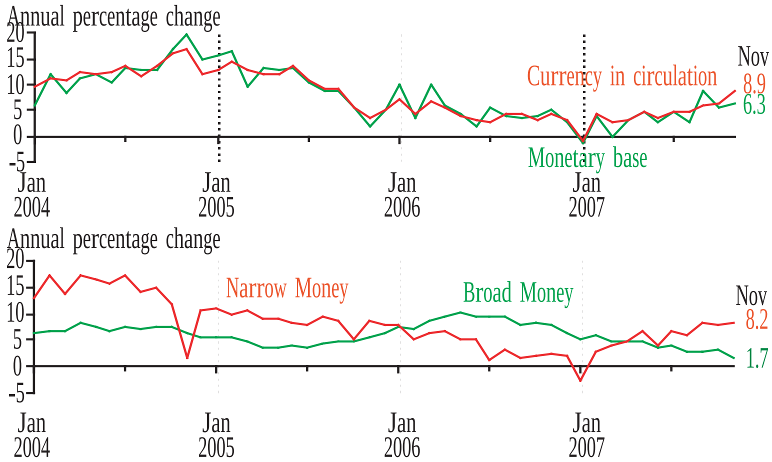
Source: Bank of Thailand

Monetary base and money supply

Cash held by the private sector accelerated in line with the recovery in private domestic spending.

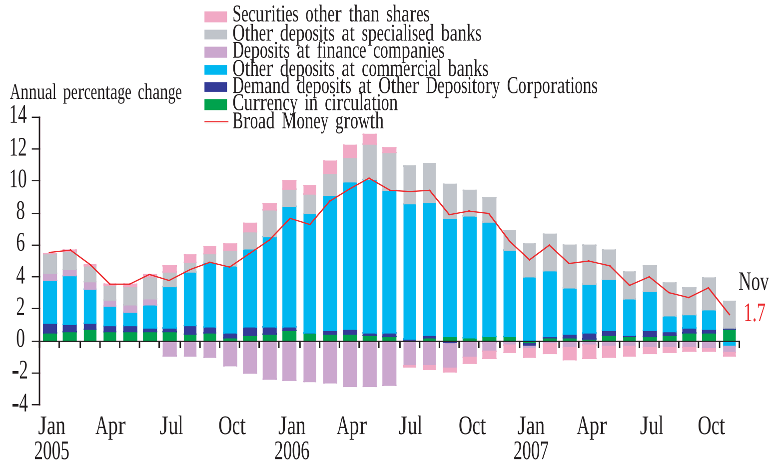
During the October-November period, the monetary base expanded at an average rate of 5.9 per cent year-on-year, higher than the average growth of 5.4 per cent in 2007 Q3. Moreover, the components of the monetary base indicated that growth of cash held by the private sector accelerated, in line with the recovery in private consumption indicators such as value-added tax revenue.

Chart 3.4 Growth rate of money supply



Source: Bank of Thailand

Chart 3.5 Contribution to broad money growth



Source: Bank of Thailand

Broad money grew at an average rate of 2.5 per cent during the October-November period, down from 2007 Q3 where average growth registered at 3.3 per cent year-on-year. This slowdown resulted from a continued decline in deposits in the banking system since the middle of 2006, and was in line with the downward trend of interest rates on deposits at commercial banks.

Adjustments of the banking system

Most commercial banks kept their reference interest rates unchanged.

With the policy rate remaining unchanged since the MPC meeting in August 2007, most commercial banks kept their reference interest rates steady during this quarter. The average 3-month and 12-month time deposit rates of the four largest commercial banks remained at 2.06 and 2.31 per cent per annum, respectively, and the average MLR of the four largest commercial banks also stood at 6.87 per cent per annum at the end of 2007 Q4, unchanged from 2007 Q3. Although special deposits with higher interest rates relative to the regular term-deposits were launched by some commercial banks in this quarter to compete for the deposit base, the overall structure of commercial banks' deposit and lending rates remained unaffected.

Table 3.1 The policy rate and banks' reference retail rates*

Unit: Per cent	2005	2006	2007**					
	Dec	Dec	Jan	Mar	Apr	May	Jul	Dec
Policy rate	4.00	5.00	4.75	4.50	4.00	3.50	3.25	3.25
Average reference retail rates of the 4 largest banks								
Savings	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
3-month	2.00	3.44	3.44	3.25	2.75	2.25	2.06	2.06
6-month	2.25	3.69	3.69	3.25	2.75	2.25	2.06	2.06
12-month	2.50	4.00	3.81	3.25	2.75	2.25	2.31	2.31
24-month	3.75	4.69	4.44	3.69	3.00	2.50	2.50	2.50
MLR	6.50	7.69	7.69	7.50	7.19	7.00	6.87	6.87

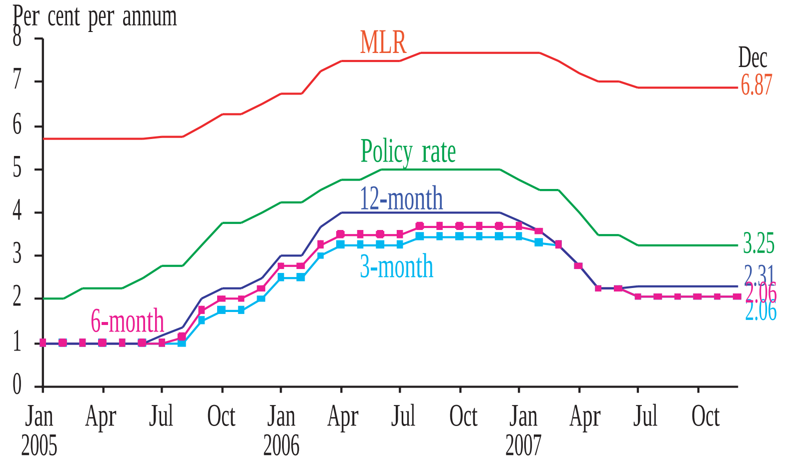
Note: *Rates at end-period
**Displaying only those with a significant change in rates
Source: Bank of Thailand

The real 12-month deposit rate and the real MLR declined from the previous quarter as a result of the increase in both headline and forcasted inflation.

Although commercial banks' reference interest rates remained unchanged, the increase in contemporaneous headline inflation led to a decline in the real MLR[1/] to 3.67 per cent per annum at the end of December 2007. The real 12-month deposit rate[2/] also decreased to -0.98 percent per annum as a result of a slight increase in forecasted inflation 12 months ahead.

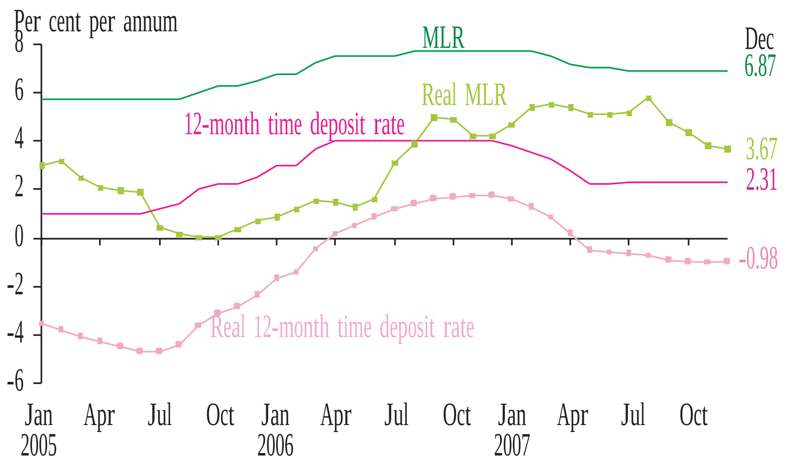
[1/] Real MLR = MLR - contemporaneous headline inflation.
[2/] Real deposit rate = 12-month deposit rate - average inflation forecast 12 months ahead.

Chart 3.6 Policy rate and commercial banks' reference retail rates*



Note: *Average rate of the 4 largest commercial banks at end-period
Source: Bank of Thailand

Chart 3.7 Commercial banks' interest rates*



Note: *Average rate of the 4 largest commercial banks
Source: Bank of Thailand

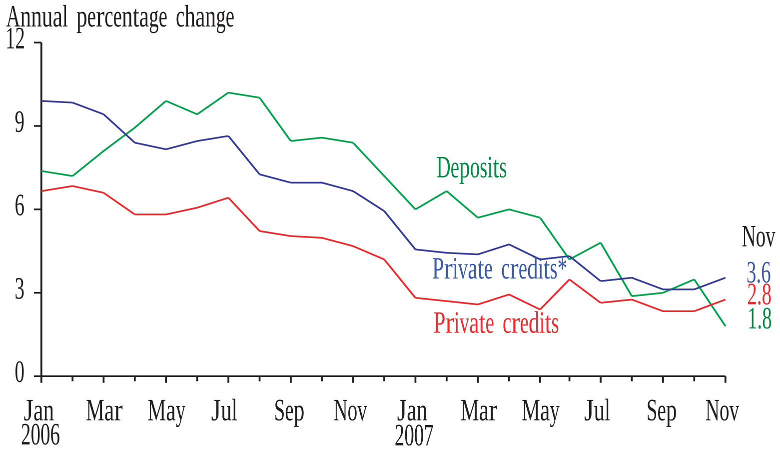
The growth rate of deposits of Other Depository Corporations continued to decline.

Deposits of Other Depository Corporations[3/] continued to exhibit a declining trend. In November 2007, deposits grew by 1.8 per cent year-on-year, due partly to the withdrawal of deposits by customers to

[3/] Other Depository Corporations comprise domestically registered commercial banks, branches of foreign banks, international banking facilities, finance companies, Specialised Financial Institutions (including Government Savings Bank, Government Housing Banks, Bank for Agriculture and Agricultural Cooperatives, Export-Import Bank of Thailand, Small and Medium Enterprise Development Bank of Thailand, Islamic Bank of Thailand), saving cooperatives, and money market mutual funds.

purchase FIDF saving bonds. However, even taking this temporary factor into account, the growth rate of deposits continued to slow down given the high-base effect from last year's escalation in growth of deposits, together with the low interest rate environment that induced investors to shift their deposits to other alternatives such as saving bonds or mutual funds. Moreover, the issuance of bills of exchange by commercial banks was another important factor resulting in the decline in deposits of Other Depository Corporations.

Chart 3.8 Other Depository Corporations' deposits and private credits

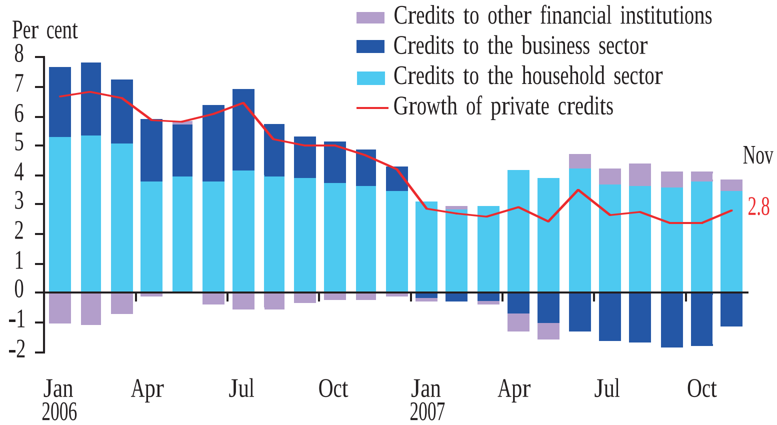


Note: *Excluding the effects of loan write-offs and transfers to AMCs
Source: Bank of Thailand

The growth of private credits of Other Depository Corporations' continued to expand at a low rate. However, the latest indicators for private credits pointed toward an improvement in growth, which registered at 2.8 per cent year-on-year in November, compared to 2.4 per cent at the end of the previous quarter. Credits to the corporate sector also showed signs of a recovery after a continued slowdown since the beginning of the year. Moreover, credits to the household sector, which was the major driver in overall private credit growth, continued to expand robustly. Excluding the effect of loan write-offs and transfers to AMCs, private credits grew by 3.6 per cent in November 2007, compared to 3.1 per cent at the end of the previous quarter.

The private credits of Other Depositary Corporations continued to expand at a low level, but began to show signs of an improvement.

Chart 3.9 Contribution to growth of private credits of Other Depository Corporations



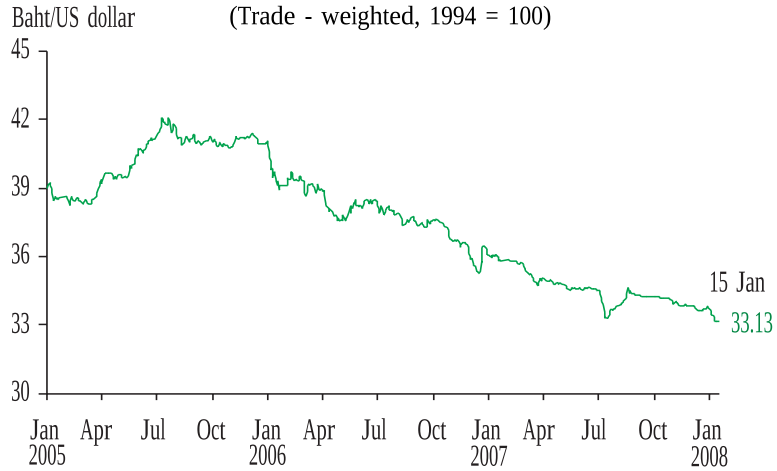
Source: Bank of Thailand

Exchange rates and capital flows

In 2007 Q4, the volatility of the exchange rate of the baht against the US dollar moderated compared to other regional and major currencies.

In 2007 Q4, the exchange rate between the baht and the US dollar moved with greater stability, with the baht appreciating gradually as confidence in the US dollar deteriorated in response to weakening US economic indicators. In addition, a marked rise in export receipts, a continued current account surplus as well as market expectations of a weaker dollar continued to pressure the baht to appreciate in this quarter. Nevertheless, a number of factors helped to counterbalance the baht's appreciation, including investors' risk aversion

Chart 3.10 Exchange rate
(Trade - weighted, 1994 = 100)



Source: Bank of Thailand

from concerns stemming from problems in the subprime market, which resulted in a reduction of holdings of Thai equities and other assets. Other concerns arose from the verdict on the privatization of PTT Public Company Limited, as well as the BOT's intervention in the foreign exchange market in conjunction with the relaxation of capital flow measures to promote more well-balanced capital flows.

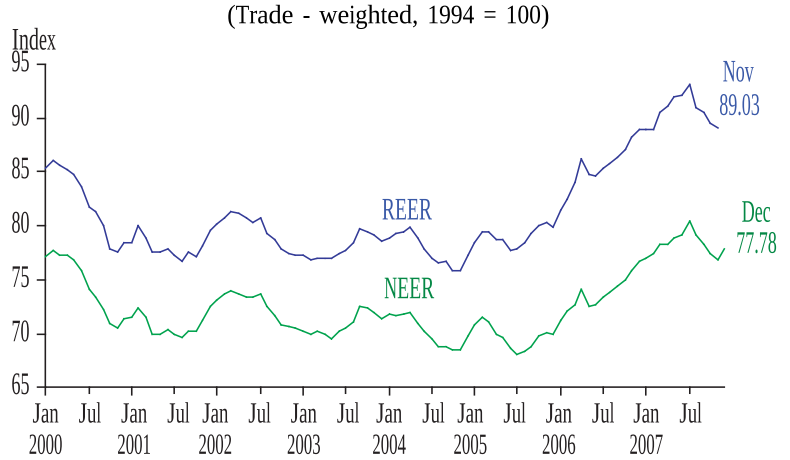
In this context, the volatility of the exchange rate of the baht against the US dollar in Q4 moderated compared to other regional and major currencies.

Despite the appreciation against the US dollar, the Thai baht depreciated against trading partners and competitors.

The baht in 2007 Q4 averaged at 33.94 bath per US dollar, a 0.3 per cent appreciation from the previous quarter's average. On the other hand, the Thai baht Nominal Effective Exchange Rate (NEER), calculated as a weighted average of bilateral exchange rates between the baht and major trading partners' currencies fell by 2.4 per cent. Despite the baht's appreciation against the US dollar, it weakened against regional currencies and other major currencies such as the Japanese yen and the euro.

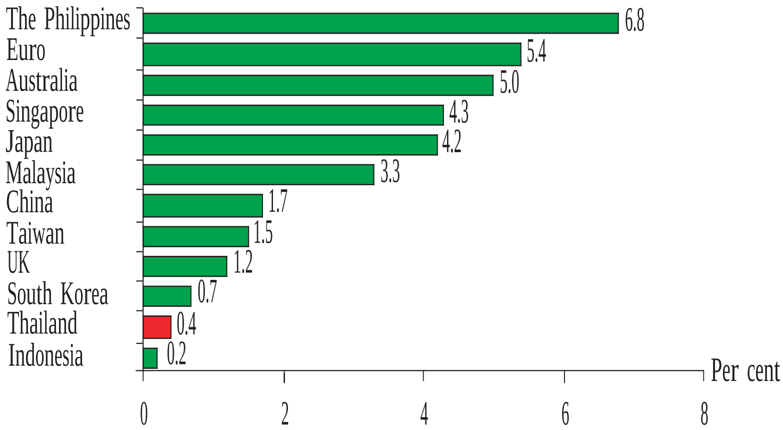
The Real Effective Exchange Rate (REER), calculated by deflating the NEER by inflation to reflect the country's price competitiveness, also reported a 2.5 per cent decline in the first two months of this quarter, compared to the 2007 Q3 average, as a result of the decline in the NEER.

Chart 3.11 Nominal effective exchange rate of the Thai baht (NEER)
(Trade - weighted, 1994 = 100)



Source: Bank of Thailand

Chart 3.12 Change in the values of foreign currencies against the US dollar (average in 2007 Q4 compared with 2007 Q3)

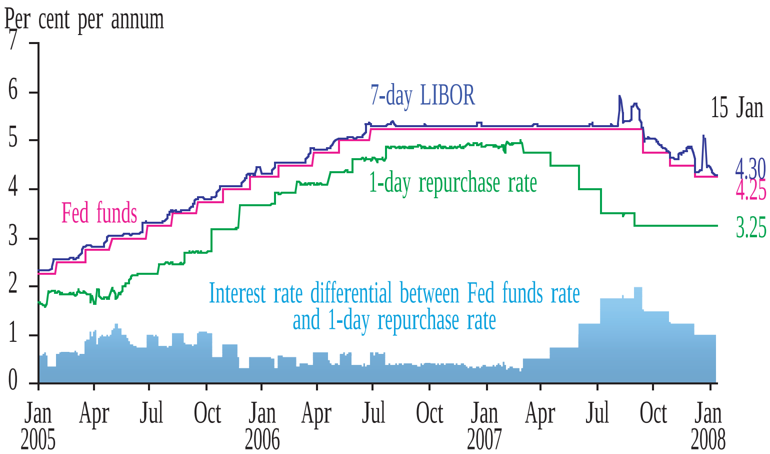


Source: Bank of Thailand

Interest rate differential between the US and Thai policy rates at end-2007 declined from the previous quarter.

The differential between the US and Thai policy rates at end-2007 was 1 per cent, down from 1.5 per cent at the end of 2007 Q3. This narrower differential resulted from the FOMC's two consecutive rate cuts on 30 October 2007 and 11 December 2007 due to concerns that problems in the subprime market could adversely impact US economic growth, while the Thai policy rate remained unchanged throughout the quarter. Nonetheless, this narrower interest rate gap had yet to pose any significant impact on the movement of capital flows.

Chart 3.13 LIBOR, Fed funds rate and Thai repurchase rate



Source: Bank of Thailand

Overall external stability remained sound. The current account continued to register a surplus, reaching 4.5 billion US dollars during the October-November period. This amounted to an accumulated current account surplus of 13.3 billion US dollars since the beginning of 2007, and was a factor contributing to the baht's appreciation throughout the year. However, the effects from the relaxation of capital outflow measures since the beginning of 2007 began to show in the second half of 2007, reflected in the constant outflow of investment to foreign stock markets during this period. This action, in effect, helped balance flows of capital in Thailand that could help alleviate the appreciation pressure on the baht to some extent.

The continued appreciation of the baht was mainly due to the sustained current account surplus.

Table 3.2 Balance of payments

Unit: Billion US dollars	2006	2006		2007P				
		H1	H2	H1	Q3	Oct	Nov	Jan-Oct
Current account balance*	2.2	-1.6	3.8	5.8	2.9	1.9	2.6	10.6
Net capital flows*	5.7	4.7	1.0	-2.0	0.7	-1.6	n.a.	-2.9
Bank of Thailand	0.4	0.3	0.1	-0.8	0.1	0.2	n.a.	-0.5
Public	-0.6	-0.2	-0.4	-1.9	-0.1	0.1	n.a.	-1.9
Bank	-7.4	-4.1	-3.3	-6.1	2.0	-0.3	n.a.	-4.4
Others	13.3	8.8	4.5	6.8	-1.2	-1.6	n.a.	3.9
Balance of payments	12.7	4.7	8.1	5.7	5.1	1.2	1.7	12.0

Note: * Reinvested earnings are recorded as part of direct investment in the financial account, and its contra entry recorded as 'investment income' in the current account
P = Preliminary
Source: Bank of Thailand

The sustained surplus in the balance of payments led to a continued accumulation of international reserves. As of end-November 2007, international reserves stood at 84.6 billion US dollars, up from 80.7 billion US dollars at the end of 2007 Q3. When combined with the BOT's net forward position, international reserves increased to 103.0 billion US dollars. External liquidity indicators remained favourable with the ratio of international reserves to short-term external debt registering at 3.9 as of end-October 2007.

4. Financial Stability Conditions and Outlook

In 2007 Q3, the Thai economy continued to be challenged by a number of risk factors, both domestic and international, such as a surge in world oil price, domestic political uncertainty that continued to undermine business confidence and the fluctuation in world financial markets. As a result, a few indicators of financial vulnerability, namely household's delinquency ratio and commercial banks' non-performing loans, worsened slightly. The overall economy seemed to be fairly resilient, however, as seen from improved corporate sector performance and satisfactory financial condition of commercial banks. In 2007 Q4 and going forward, better economic prospects as well as improved political outlook should help strengthen Thailand's economic and financial system.

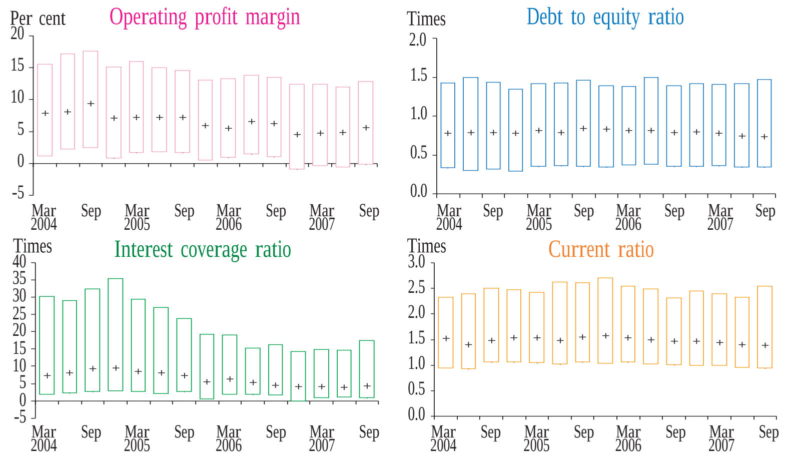
Non-financial corporate sector

In 2007 Q3, profitability of the corporate sector slightly improved. Together with a decline in financial cost, the debt service ability improved.

The financial status of Thailand's corporate sector improved somewhat in 2007 Q3 compared to previous quarter,[1/] as reflected by the moderate upturn in operating profit margin of most listed non-financial corporations following a pick-up in sales as the economy started to turn around and a reduction in operating costs. With better profitabiltiy and low financial costs, a result of accommodative monetary policy in the earlier quarters, the corporate sector's debt service ability improved, as reflected by considerably higher interest coverage ratio (ICR) particularly for high-performing firms (above the 75th percentile). Furthermore, the business sector's financial structure and liquidity remained sound. Debt-to-equity of most firms stayed below 1 while the current ratio of more than 75 per cent of firms exceeded 1, revealing ample liquidity.

[1/] From the quarter-to-quarter changes in the inter-quartile (covering the 25th-75th percentile range) and median values of financial ratios of stock-market listed non-financial corporations.

Chart 4.1 Performance of listed non-financial companies in 2007 Q3



Note: Each bar depicts an interquartile range, where upper and lower bounds represent the 25th and 75th percentile, respectively. The symbol + indicates the median.
Source: Stock Exchange of Thailand, calculations by Bank of Thailand staff

Going forward, the risks surrounding the financial health of the corporate sector arose mainly from heightened cost of production.

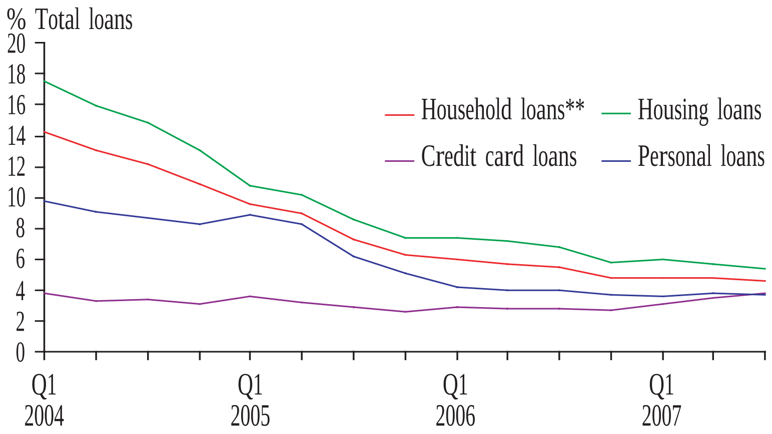
Although the performance and financial status of the corporate sector showed some improvement, the MPC viewed that with some probability the corporate sector would be affected by various adverse risks going forward; for instance, growing pressure on production cost as world oil and raw material prices accelerated, the remaining uncertainty surrounding global economic outlook and a fragile recovery of domestic demand, which despite recent signs of improvement could still be tied down by weak consumer and investor confidence and should be monitored closely.

Household sector

Overall, NPLs of the household sector remained moderate but the delinquency ratio of the low-to-middle income group continued to rise from the previous quarter.

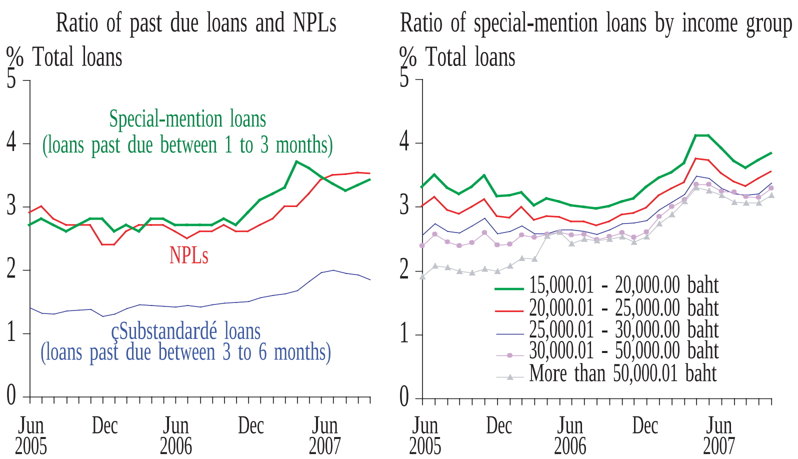
In 2007 Q3, low- to middle-income households appeared to be less financially robust, as both credit card as well as personal loan delinquency ratios continued to mount from the previous quarter. The big picture, however, revealed that outstanding loans past due between 1 to 3 months or "special mention" loans remained moderate as a share of total loan while non-performing loans in the housing sector, which accounted for one half of total commercial bank loans to households, still remained low relative to the previous quarter. At this rate, household delinquency should not pose a significant threat to the overall health of financial institutions.

Chart 4.2 Ratio of households' non-performing loans of commercial banks*, classified by purpose



Note: * Commercial banks are Thai commercial banks and foreign bank branches.
** Household loans comprise housing loans, credit card loans, and personal loans.
Source: Bank of Thailand

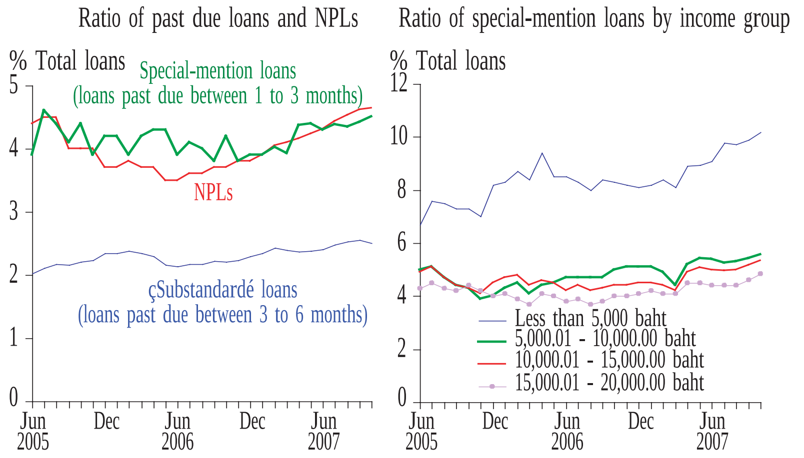
Chart 4.3 Ratio of past due loans and NPLs of credit card loans*



Note: * Bank and non-bank credit card loans under the BOT's supervision
Source: Bank of Thailand

The MPC viewed the problem of financial delinquency of low- to middle income households as temporary, as households' income and ability to service debt should improve going forward with broad-based economic recovery supported by better political outlook and an accommodative monetary policy stance. However, the MPC deemed it necessary to continue monitoring developments in delinquency ratios for this particular household group to ensure overall financial stability was not affected.

Chart 4.4 Ratio of past due loans and NPLs of personal loans*



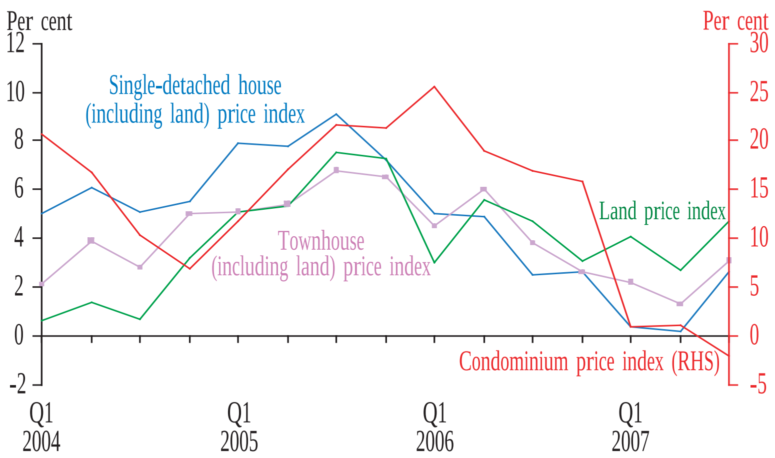
Note: *Bank and non-bank personal loans under the BOT's supervision
Source: Bank of Thailand

Real estate sector

The probability of a real estate price bubble remained low.

The real estate price index rebounded in 2007 Q3 following rising construction cost, which was in line with oil prices, and revived land and building transactions. The prices of luxury condominiums declined considerably, partly owing to price-reduction schemes to stimulate sales in times of a demand slump. As a result, the probability of a real estate price bubble and the risks surrounding that event remained low.

Chart 4.5 Housing price indices



Source: Bank of Thailand, computed using the Government Housing Bank appraisal database and Jones Lang Lasalle

Financial institutions

In 2007 Q3, the performance of Thai commercial banks improved slightly from the previous quarter.

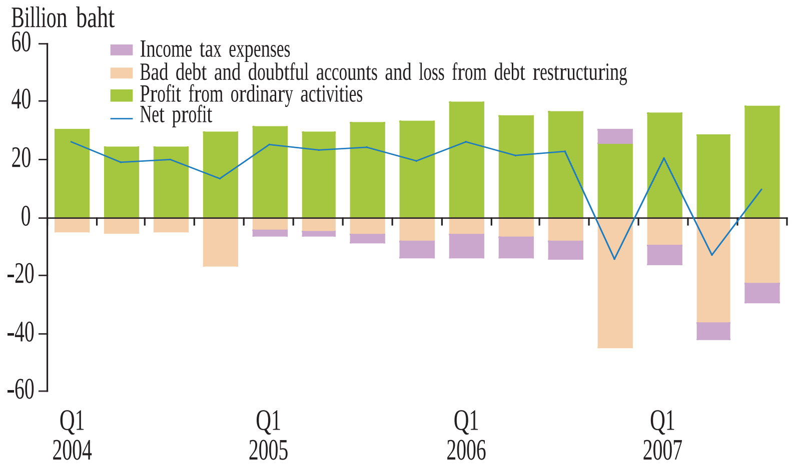
The overall stability of financial institutions remained sound, as reflected by the Financial Soundness Indicators (FSI). A closer look into the suite of indicators revealed that even though the NPL ratio picked up slightly in 2007 Q3, the capital adequacy ratio stood well above the international standard of 8.5 per cent, owing to an increase in retained earnings or capital injection at a number of commercial banks. Furthermore, the banking system remained profitable from a decline in interest expense as high-yield term deposits started to graduate; and from lower cost of borrowing as commercial banks switched to short-term debt instrument instead of normal deposits.

Table 4.1 Thailand's Financial Soundness Indicators (September 2007)1/

Key indicators (%)	2004	2005	2006	2007		
	Dec	Dec	Dec	Mar	Jun	Sep
1. Capital adequacy						
1.1 Regulatory capital to risk-weighted assets (8.50)2/	11.94	13.22	13.59	13.85	13.93	14.63
1.2 Regulatory tier 1 capital to risk-weighted assets (4.25)2/	8.71	9.95	10.70	11.03	10.93	11.66
2. Asset quality						
2.1 Non-performing loans to total loans	11.94	9.06	8.07	8.17	8.49	8.58
3. Earning and profitability						
3.1 Return on assets (ROA)	1.25	1.36	0.77	1.06	0.20	0.29
3.2 Interest margin3/ to gross income4/	67.3	72.8	72.5	71.3	71.7	73.0
3.3 Non-interest expenses to gross income	53.9	52.7	56.8	56.0	61.4	59.3
4. Liquidity						
4.1 Liquid assets5/ to total assets	25.0	24.3	26.2	27.8	27.1	27.1
4.2 Liquid assets to short-term liabilities6/	29.9	29.9	32.7	34.7	34.4	33.9
Number of banks	12	14	14	14	14	14

Note: 1/Based on "Peer Group" data
2/Minimum regulatory capital to risk-weighted assets
3/Interest margin = Interest income and dividend - Interest expenses
4/Gross income = Interest margin + Non-interest income
5/Liquid assets = Cash and deposits + Securities purchased under resale agreements + Investment in securities (net)
6/Short-term liabilities = Deposits (Liability side)
Source: Bank of Thailand

Chart 4.6 Performance of Thai commercial banks*



Note: *Based on data of 18 Thai commercial banks
Source: Bank of Thailand

As far as the impact on the Thai banking sector from the subprime problem in the US is concerned, a preliminary assessment revealed minimal impact with only a few banks reporting limited financial losses from investment in the subprime-related collateralized debt obligations (CDOs). Nevertheless, the MPC was of the view that the prolonged credit problem in the US could jeopardize Thai export prospects with possible spillover into commercial bank loan quality and would continue to monitor its development and assess its direct and indirect impacts on financial stability going forward.

Financial markets

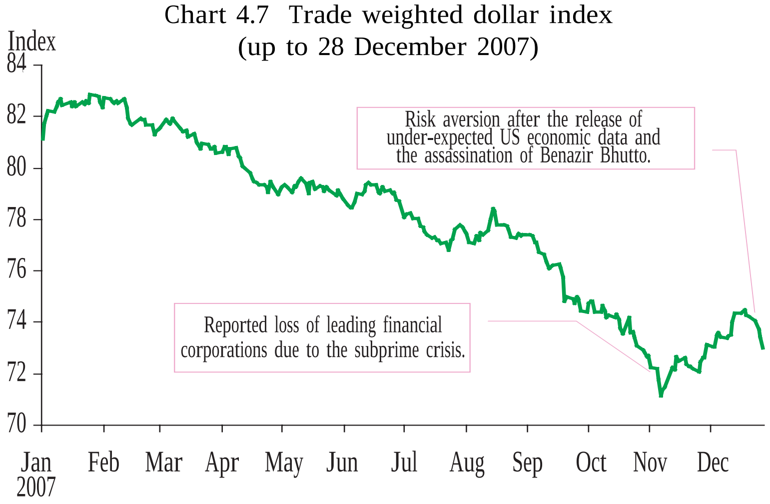
In 2008 Q4, the surge in world oil price and investors' agitation over the financial market problem in the US were underlying causes of world financial market fluctuation, which spilled over to the Thai financial market through volatile international capital flows, relative interest rates and exchange rates. In addition, market expectation of the removal of the remaining unremunerated reserve requirement (URR) helped explain domestic financial market volatility.

Foreign exchange market

Major currencies remained highly volatile due to investors' concern about the subprime problem and US economy going forward.

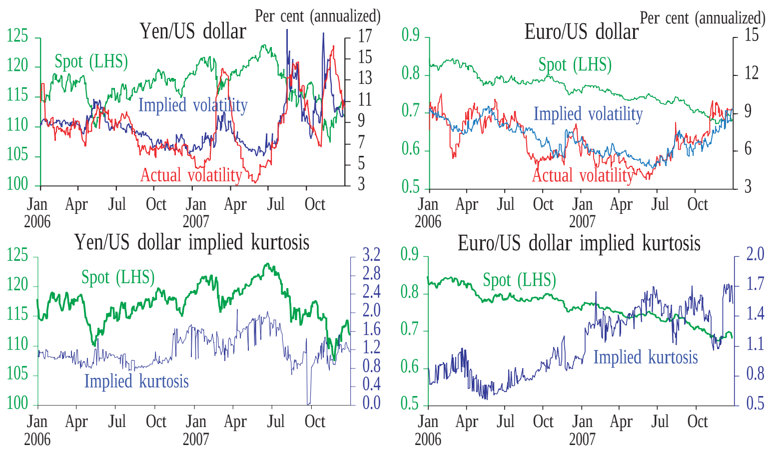
The US dollar index remained highly volatile in the face of the prolonged subprime problem and fear of a US economic slowdown. The US dollar continued to depreciate during the beginning of 2007 Q4 after leading financial companies reported their losses from investment in subprime-related CDOs and from the expectation of further rate cuts by the Federal Reserve as a way to mitigate the liquidity crunch in the financial system to prevent a slowdown of the US economy. The US dollar made a rebound toward the end of the fourth quarter as investors'

Chart 4.7 Trade weighted dollar index (up to 28 December 2007)



Source: Bloomberg

Chart 4.8 Volatility of major currencies

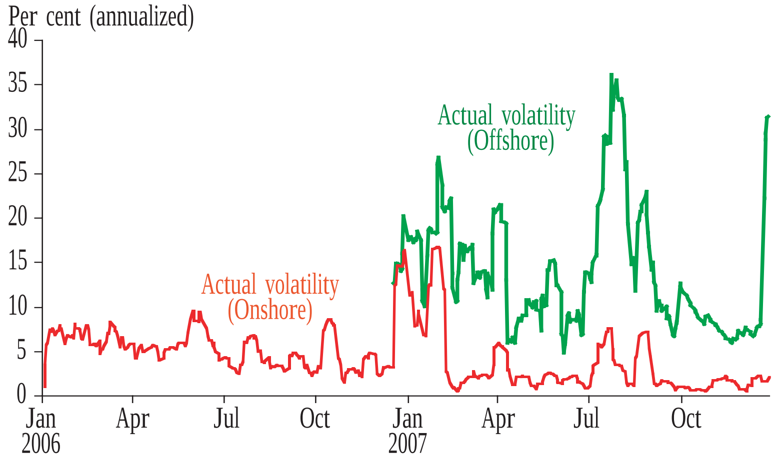


Source: Bloomberg

rebalanced their currency positions toward the end of the year. Improved confidence in stock and money markets after major central banks coordinated their liquidity injection also helped lift the US dollar near end-year. Nevertheless, the US dollar dropped again after released US economic figures did not meet market expectations. The assassination of Mrs. Benazir Bhutto also heightened concerns over geopolitical risks during the last trading week.

The volatility of the yen and the euro vis-à-vis the US dollar measured from historical data and from market expectation remained high, consistent with high capital flow volatility in the context of the uncertain subprime problem. Furthermore, the euro's implied kurtosis value indicated a high probability of drastic movement in the currency; one reason for such expectation that the euro could further appreciate was from accelerating stock market investment in the euro-area. At the same time, the rising implied kurtosis of the yen reflected concerns of a drastic movement from time-varying risk aversion, which could cause fluctuation in carry trades, as well as the volatile US dollar sentiment.

Chart 4.9 Baht option-implied volatility (up to 28 December 2007)



Source: Bloomberg

Exchange rates of the baht against the US dollar in the offshore and onshore markets were less volatile.

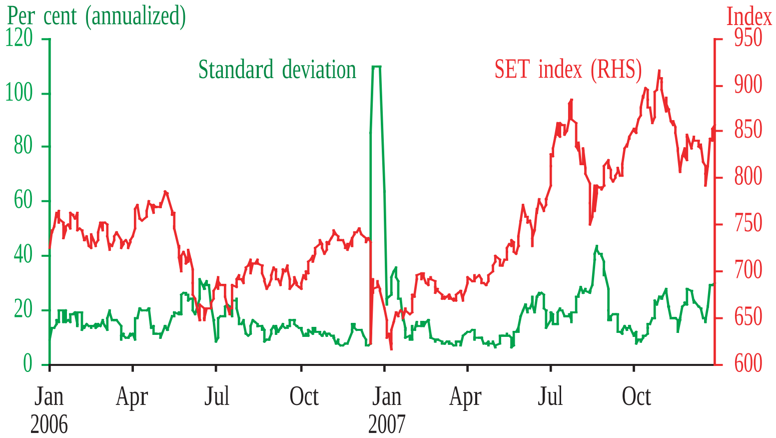
In 2007 Q4, the volatility of onshore baht vis-à-vis US dollar declined from 2007 Q3. The baht fluctuated within a narrow trading range throughout the quarter. The demand for baht from exporters was more in balance with demand for dollar from oil companies as well as state enterprises, which repaid foreign debts. The offshore baht volatility in 2007 Q4 also declined from the previous quarter until the end of the quarter when the assassination of Mrs. Benazir Bhutto caused the volatility to accelerate in a thin market.

Thai equity market

In 2007 Q4, the Thai stock market index averaged slightly above the previous quarter. The index climbed to 915.03 at the end of October, supported by improvements in domestic and external factors, such as a constant pick-up in US stocks. Nevertheless, the market faced a downturn during the latter half of the quarter from the surge in world oil price and deteriorating US corporate performance. In addition, the wrangling legal conflicts over PTT Public Company Limited (PTT)'s privatization program and the removal of gas pipelines from PTT assets also exacerbated market volatility. In 2007 Q4, foreign investors were net sellers in the market, but for the whole year they were net buyers of 55 billion baht.

In 2007 Q4, the SET Index rose slightly from the previous quarter, but was still volatile.

Chart 4.10 Volatility in the Thai stock market
(up to 28 December 2007)



Source: Stock Exchange of Thailand, calculations by Bank of Thailand

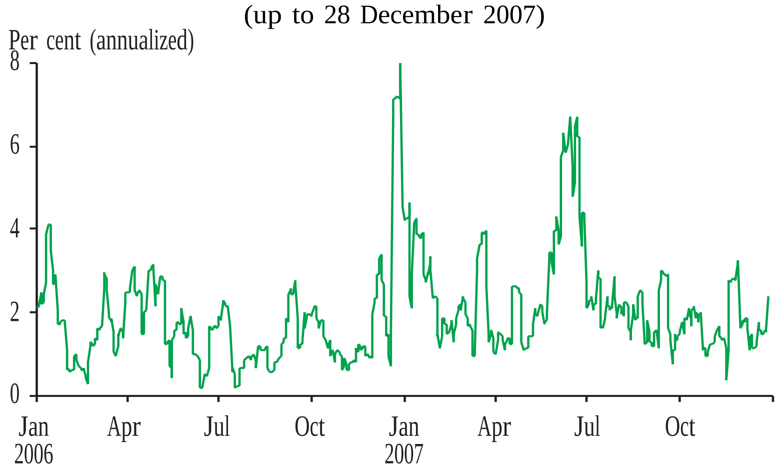
Thai government bond market

In 2007 Q4, the volatility of the Thai government bond yields diminished slightly while the average yield rose marginally from the previous quarter, in line with stronger returns from the US treasuries as inflation in the US started to pick up and signaled little room for the Fed to further cut its policy interest rate. Furthermore, the progressive

In 2007 Q4, the volatility of the government bond yields declined and the yield curve rose marginally from the previous quarter.

decline in the Thai policy interest rate together with rising headline inflation also curbed market expectation that the MPC would decide to cut rates further for the rest of 2007.

Chart 4.11 Volatility in the Thai government bond market (up to 28 December 2007)



Source: Thai Bond Market Association, calculations by Bank of Thailand

To sum up, overall financial stability remained sound. Nevertheless, the likelihood of further oil price increase and the widened US subprime problem, leading to continued international financial market fluctuation, could pose risks to Thailand's economic recovery going forward as well as to overall financial stability.

5. Inflation Outlook

The Thai economy in 2007 Q3 expanded by more than the MPC had projected. In particular, private domestic demand improved as a result of gradually accelerating consumption and a turnaround in investment, in line with improved business sentiment compared to the previous quarter. Meanwhile, public spending and exports continued to drive the economy. When considered together with preliminary indicators for 2007 Q4, which reflected continued improvements in both private consumption and investment, the MPC assessed that recovery of private domestic demand should continue into 2008. Factors supporting the recovery included continued momentum from the end of 2007, especially given greater political clarity after the formation of the new government, continuation of economic policy and accommodative monetary policy. The recovery in private domestic demand would play a greater role in propelling the economy forward and would compensate for a slowdown in exports in 2008, in line with trading partners' economies. This assessment was consistent with that of the previous *Inflation Report.* (October 2007)

Price pressures began to rise noticeably in 2007 Q4 after remaining subdued in the previous three quarters. The increase in pressure stemmed mainly from a marked acceleration in world oil prices, which fed into domestic retail oil prices and passed through to the cost of public transportation. Moreover, prices of non-fuel commodities also rose and resulted in higher costs of production. As a result, prices of consumer goods and services increased gradually but continuously, including those under the Ministry of Commerce's price administration measures.

Looking ahead, price pressures from the supply side would continue to rise owing to higher prices of oil, farm produce, and non-fuel commodities. These higher input costs would be passed through to related goods and services, as demonstrated through the continued increase in prices of LPG fuel. Meanwhile, the minimal pressure from the demand side at present was likely to increase following a recovery in domestic demand. However, the authorities' continued effort in preserving consumer welfare through price administration measures of various goods and services would help to ensure a gradual pass-through. Moreover, an appreciating trend of the baht in line with regional currencies, owing to a weaker US dollar as a result of a slowdown in the US economy, would help alleviate some of the impact of higher world prices on import prices in baht terms. Overall, the MPC assessed that headline and core inflation in 2008 and 2009 would be higher than previously projected.

In the economic and inflation projections for the upcoming periods, the MPC exercised caution in considering the assumptions used. The projections below are presented as fan charts, which are obtained from the macroeconometric model and incorporates the MPC's judgments. The fan charts reflect uncertainties surrounding a range of events and are under the assumption that the policy interest rate stays at the current level of 3.25 per cent per annum from 2008 Q1 to 2009 Q4, similar to the level assumed in the previous *Inflation Report.* The assumption is consistent with the decisions in the MPC meetings on 4 December 2007 and 16 January 2008 to maintain the policy rate.

Forecast assumptions

In forming economic and inflation forecasts for the next 8 quarters, the MPC needed to make the most plausible baseline assumptions on various factors including international economic and financial conditions, world commodity prices and fiscal conditions. These assumptions are summarised below.

International economic and financial conditions

Risks to the global economy increased as a result of the persistent problems in the US subprime market and the periodic announcement of losses from major financial institutions. As a result, the US economy became more fragile. Furthermore, the Euro area, Japan and the Asian economies were expected to slow down by more than previously anticipated. Meanwhile, risks to global inflation also increased due to increasing crude oil prices and non-fuel commodity prices.

The MPC revised down the assumption on US output growth in 2008 before reverting to the same trend in 2009 H2 as in the previous Report.

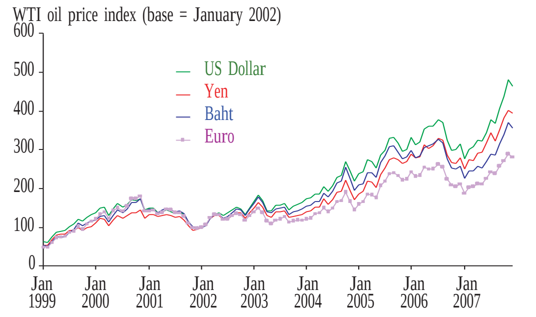
The US economy grew by 2.8 per cent year-on-year in 2007 Q3, accelerating from 1.9 per cent in 2007 Q2, due to an expansion in private consumption and exports. However, private investment, particularly residential investment, continued to contract further. The

The resiliency of the world economy: What makes the recent oil price surge different from past oil crises?

The surge in oil prices over the past 5-6 years had led many to question why the world economy was not in a recession already. This article lists a number of factors that helped lessen the impact of the current oil price hike, as follows:

1. The price of oil that matters to an economy is the local currency price, not the one denominated in US dollar. While the US dollar price of oil was more familiar to observers, the US dollar itself has been depreciating against a broad index of currencies over the past couple of years. Consequently, the rise in the local currency prices of oil in most countries has been more moderate; and the impact on that economy is lessened as a result (Chart 1).

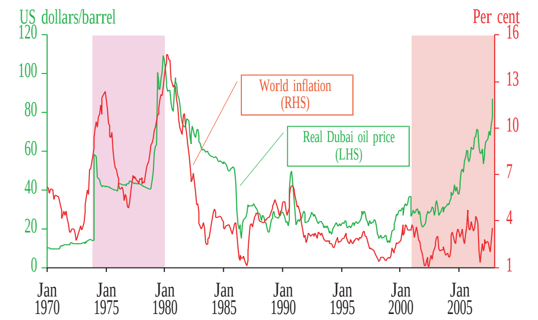
Chart 1 WTI price in different currencies



Source: Bloomberg

2. In contrast to the two previous oil crises, which were driven exclusively by supply restriction, the current surge in oil prices has been driven partly by rising oil demand, which emanates from stronger domestic demand in emerging markets like China and India. Demand-side factors help explain why the recent increase has been more gradual compared to the sharp surging pattern of past episodes.

Chart 2 Real Dubai oil price and world inflation

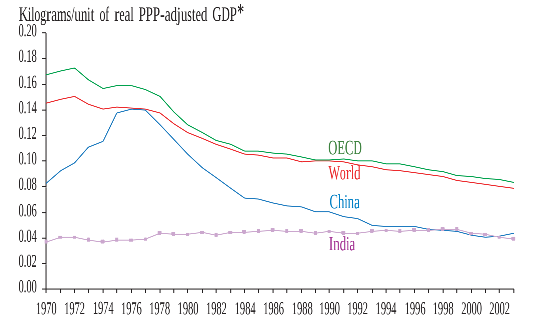


Source: PTT and Reuters

3. The pass-through of oil prices to consumer price inflation has diminished compared to the 1970s due to the change in market structure. Higher competition has reduced the ability of producers to raise prices. Moreover, the adoption of inflation targeting by many central banks has allowed them to better manage inflation expectations (Chart 2).

4. The world economy's dependency on oil has been declining over the years thanks to technological advances, which allow for more efficient oil usage, as well as greater use of alternative energy sources (Chart 3).

Chart 3 Oil intensity



Note: * Purchasing Power Parity

Source: International Monetary Fund (IMF)

5. According to a recent study by Blanchard and Gali (2007)[1/], the world economy today faces no other significant disturbances. In previous oil price hikes during the 1970s, commodity price shocks and monetary policy tightening exacerbated the impact of oil price surge on the world economy.

More recently, however, the upswing in commodity prices as well as the subprime crisis in the US have increased the probability of a recessionary outcome in the US.

[1/] Olivier J. Blanchard and Jordi Gali (2007), "The Macroeconomic Effects of Oil Shocks: Why are the 2000s so different from the 1970s?" NBER working paper

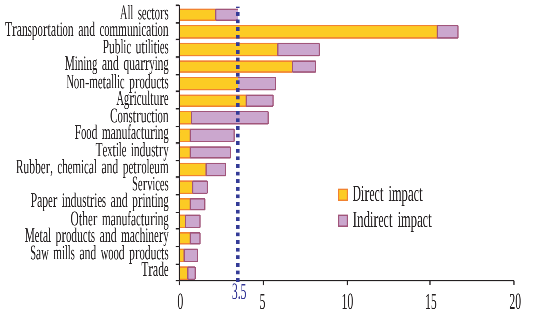
Impact of Oil Price Surge on the Thai Economy

Under the assumption that Dubai crude oil price would hover between 85 to 86 US dollars per barrel in 2008 and 2009, the MPC projected that the Thai economy would continue to expand while inflation would accelerate but remain manageable. The MPC's assessment was drawn from the Bank of Thailand's Macroeconomic Model (BOTMM) and a Vector Auto Regression (VAR) analysis. The estimated impact of an oil price surge is summarized in the Table. According to the VAR, a 1 per cent increase the price of crude oil should lower GDP growth by 0.01 per cent in the first quarter and 0.06 in the fourth quarter subsequent to the shock. The same shock would push inflation up by 0.02 and 0.06 percent in the first and the fourth quarters, respectively. BOTMM also delivered similar results with minor discrepancies.

Table : Effect on economy of a 1 per cent increase in crude oil price (in $ tonne)

	Thailand				OECD Country	
	VAR analysis		BOTMM		IEA working paper[2/]	
	Quarter 1	Quarter 4	Quarter 1	Quarter 4	That year	Next year
GDP	-0.01	-0.06	-0.02	-0.04	-0.01	-0.01
Headline inflation	0.02	0.06	0.03	0.05	0.0125	0.015

Chart 4 Proportion of oil expenditure to total cost



Source: Input-Output Table 2000, National Economic and Social Development Board

Chart 5 Proportion of energy expenditure to total expenditure, by income

Source: Household Socio-Economic Survey, National Statistical Office

At the firm-level, oil is mainly used for transportation purposes rather than as a direct input. The impact of rising oil prices on Thai manufacturers appears to be limited because the proportion of oil expenditure to total cost is less than 10 percent (Chart 4). Nevertheless, industries using chemical material and substances in the production process are heavily affected as their raw material prices vary closely with crude oil prices. The agricultural sector, on the other hand, faces rising transport costs. In any case, the recent oil prices has rendered alternative energy fuels such as ethanol and biofuels commercial viable. This phenomenon helps cushion the impact on farmers as the demand for palm oil, maize, soybean and grains, which can be processed into ethanol, rose.

The impact on Thai households has also been limited as expenditure on oil represents a relatively small portion of total household expenditure and cheaper alternative energy sources are also available in the market. Nevertheless, a distributional concern exists because the impact on households has been unevenly distributed; as low-income households tend to spend a larger portion of their expenditure on oil and transportation expenses (Chart 5).

[2/] International Energy Agency (2004), "Analysis of the impact of the oil prices on the global economy".

subprime problem was likely to persist further as a number of subprime borrowers under adjustable rate mortgage contracts would have to face floating-rate interest payments, and the resulting debt burdens would increase in 2008. Furthermore, there was a tendency that leading financial institutions would announce further losses from derivatives related to subprime loans. At the same time, financial institutions were likely to tighten the lending standards of residential, industrial and personal loans. Thus, the MPC assessed that, even though the US economy grew favorably in 2007 Q3, going forward, risks to growth would increase. The MPC thus revised down the assumption on US output growth in 2008 before reverting to the same trend in 2009 H2 as in the previous *Report.*

The MPC viewed that the FOMC would likely cut the Fed funds rate twice totalling 75 basis points in 2008 Q1.

On 11 December 2007, the FOMC cut the Fed funds rate and discount rate by 25 basis points to 4.25 and 4.75 per cent, respectively. This followed the previous cut of 25 basis points on 31 October 2007 for both the Fed funds and discount rates. Going forward, the FOMC was likely to ease monetary policy further due to the increasing risks to growth. The MPC thus viewed that the FOMC would cut the Fed funds rate further by 50 and 25 basis points respectively in the next two meetings which would bring the Fed funds rate down to 3.5 per cent at the end of 2008 Q1.

The euro economy was expected to expand at the slower rate than anticipated in the previous Report due to the impact from the US subprime problem and euro appreciation.

The euro area economy grew by 2.7 per cent year-on-year in 2007 Q3, accelerating from the previous quarter's growth rate of 2.5 per cent due to an expansion in private consumption, investment and exports. However, the MPC viewed that the euro area economy would be affected more substantially from the problems in the US subprime market as the euro appreciated by more than previously anticipated. The stronger euro could dampen euro area's export competitiveness going forward. The MPC thus assumed that, for 2008, the euro economy would expand at a slower rate than anticipated in the previous *Report* before reverting to the same trend in 2009, in line with the pick-up of US economy.

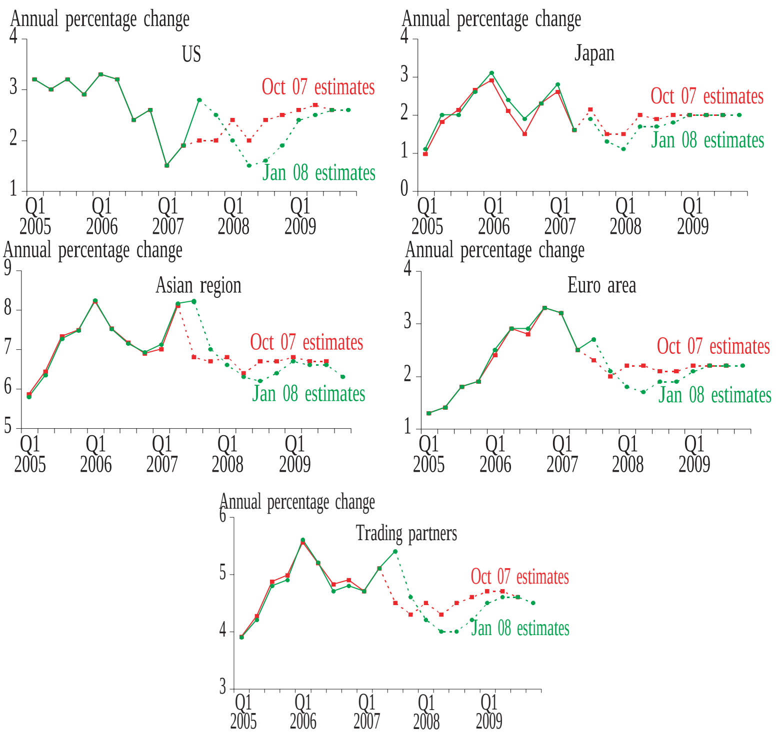
The MPC revised down the assumption on Japanese economic growth in 2007 in line with the US economy and the stronger yen appreciation.

The Japanese economy grew by 1.9 per cent year-on-year in 2007 Q3, up from 1.6 per cent in the previous quarter, due mainly to favorable private consumption and exports. Meanwhile, residential investment continued to decrease as a result of the revised Building Standard law which came into effect in June 2007, and led to tightened construction standards. Going forward, with the economic slowdown in the US, Japan's major trading partner, and the stronger yen against the US dollar, the MPC viewed that the Japanese economy in 2008 would expand at a slower rate than anticipated in the previous *Report* before reverting to the previous growth assumptions in 2009.

Despite the robust domestic demand in Asian economies, the MPC revised down its assumptions on Asian economic growth for 2008 due to the economic slowdown in major economies, especially the US.

The Asian economy continued to expand robustly in 2007 Q3, driven by strong growth of domestic demand and exports. The strong growth momentum was expected to continue in the upcoming quarters. Robust domestic demand and export diversification to the new markets could help mitigate the adverse effects from the slowdown in major economies' demand to a certain degree. However, the Asian economies still could not decouple from major economies, especially from the US. Therefore, the MPC viewed that the Asian economy would continue to be affected by the slowdown in the US economy and fluctuations in the financial markets to a certain level. As a result, the MPC revised down its assumptions on Asian economic growth for 2008 before reverting to the previous growth assumptions in 2009.

Chart 5.1 Assumptions on trading partners' growth



Source: Bank of Thailand estimates

Overall, the MPC assessed that, in 2008, Thailand's trading partners would grow at a slower rate than anticipated in the previous *Report* due mainly to the slowdown in major economies. However, growth in trading partners' economies would revert to the same trend as in the previous *Report* in 2009 H2.

In the previous period, most regional currencies appreciated against the US dollar at a faster pace than anticipated in the previous *Report.* Going forward, the US economy was expected to slow down further. The MPC thus viewed that the regional currencies would appreciate at a faster pace in 2008 and 2009 than in the previous assumptions.

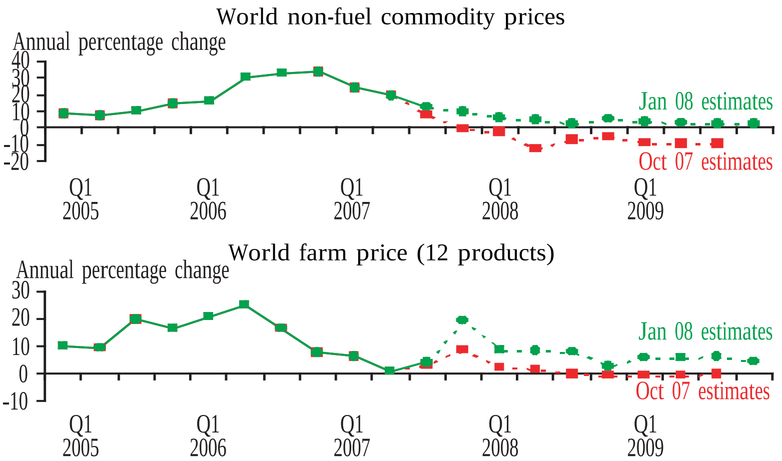
The MPC viewed that regional currencies would appreciate at a faster pace against the US dollar than anticipated in the previous Report.

World commodity prices

The prices of world non-fuel commodities were higher than the previous assumptions due to the rise in prices of both foods and base metals. The prices of base metal rose due to increasing global demand as well as price speculation during the time of US dollar depreciation and higher global inflation. The prices of raw agricultural materials rose in line with higher fuel and fertilizer prices while the cost of raising animals increased due to the higher cost of animal feed. Furthermore, prices of inputs to bio-fuel production continued to increase along with growing demand, particularly due to the US bio-fuel promotion policy. The MPC thus revised up the assumptions on world non-fuel commodity prices and the World Farm Prices Index, consisting of 12 Thai major products, from the previous assumptions (see box for further details).

The MPC revised up the assumptions on world non-fuel commodity prices and the World Farm Price Index, consisting of 12 Thai major products.

Chart 5.2 Assumptions on world commodity prices

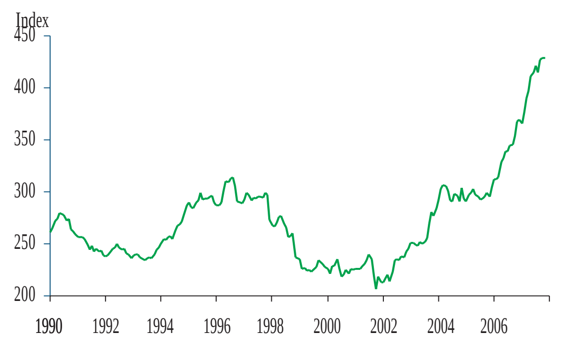


Source: Bank of Thailand estimates

The outlook for commodity prices and their impact on inflation

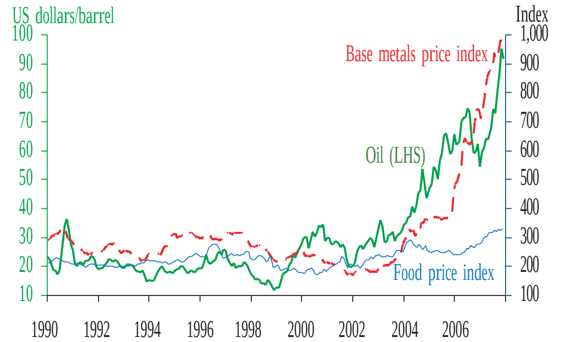
World commodity prices had continued on a rising trend since 2002. Annual growth in the commodity price index accelerated from 1.8 per cent in 2001 to 21.4 per cent in 2007[1/] due to surging crude oil, food and base metal prices (as shown in Charts 1 and 2). In 2008, despite the recent global economic slowdown, higher demand for raw materials in emerging markets - especially China and India - coupled with higher demand for raw agricultural materials for alternative energy production, would be the key drivers causing overall commodity prices to remain at a high level.

Chart 1 Commodity price index (monthly average)



Source: Commodity Research Bureau

Chart 2 Commodity price (monthly average)



Source: Commodity Research Bureau and Bloomberg: WTI

Commodity prices in 2007 and outlook for 2008

The price of West Texas Intermediate oil increased from an average of 26.1 US dollars per barrel in 2003 to 72.3 US dollars per barrel in 2007. According to OPEC, global oil demand on average stood at 85.74 million barrels per day in 2007, an increase of 1.4 per cent from the previous year due to the continued global economic expansion. Global supply, on the other hand, was relatively tight at an average of 85.72 million barrels per day. This was lower than normal levels due to higher geopolitical risks in the Middle East coupled with unfavourable weather conditions, which led to disruptions in the transport of oil. The latter disruptions were similar to disruptions caused by the hurricane in the Gulf of Mexico, which led to lower oil stocks in the US. Moreover, the increase in oil prices also resulted from the continued depreciation of the US dollar, which prompted oil producers to try to maintain their real income by lifting oil prices in dollar terms.

For 2008, OPEC forecasted that oil prices would persist at a high level, in line with the continued rise in global demand. Daily usage of oil should average at 87.06 million barrels, an increase of 1.32 million barrels per day from the previous year, while global oil supply was expected to average at a slightly higher level of 88.04 million barrels per day. The marginal increase in oil supply was due to the sluggish increase in oil exploration investment. Hence, there remained significant probability that oil prices would continue to remain high and volatile, given the limited excess production capacity .

[1/] Source: Commodity Research Bureau

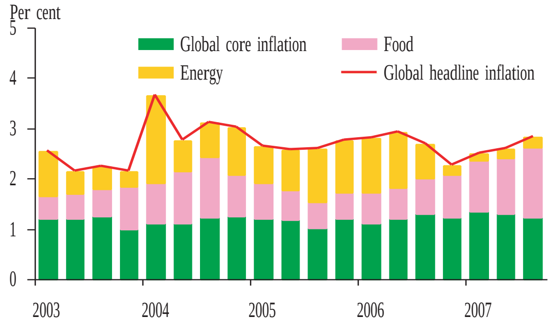
Food prices increased significantly since 2001. In 2007, the food price index increased by 21.6 per cent from the previous year, driven mainly by (1) higher production and transportation costs, given higher prices of fertilizers and oil, (2) low stocks of agricultural products, and (3) increasing demand for agricultural products such as maize and wheat, that could be used as raw materials for alternative energy production in the period of rising oil prices. Going forward, agricultural prices were expected to remain at high levels partly due to the discrepancy between supply and demand. In particular, the supply of maize, soy beans and wheat were likely to rise more slowly than the demand for these products for use as raw materials in alternative energy production, particularly given the US bio-fuels promotion policy. In addition, demand for meat products in emerging markets - in particularly China - would continue on a rising trend as standards of living increased.

The overall price of base metals[2/] increased by 43.6 per cent in 2007 from the previous year due mainly to a significant rise in the price of lead, iron and copper. In 2008 the pressures on the prices of copper and zinc were expected to decline owing to increased supply resulting from the expansion of production capacity in the previous period. However, the price of iron and aluminium were expected to remain high, given continued high demand in the construction and industrial sectors, especially in China and India. Overall, in 2008, the price of base metals was expected to rise at a slower rate than in 2007 as supply and demand became more balanced.

Impact on global inflation

The significant increase in commodity prices over the past 5 years exerted a significant amount of upward pressure on global inflation. The effect of higher energy prices on inflation increased significantly in 2004, as shown in Chart 3. Nevertheless, this effect moderated towards the end of 2006, given that the rise in oil prices began to slow down, as well as the effect from a high base. In contrast, the effects of higher food prices on inflation were more significant from mid-2005 onwards, due to the factors mentioned above.

Chart 3 Effects of commodity prices on global inflation (quarterly average)



Source: BIS

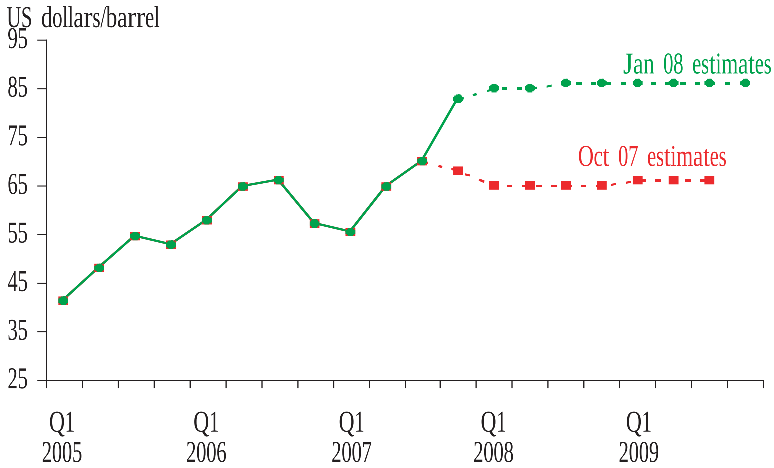
Looking ahead, high commodity prices were expected to add more upward pressures on global inflation. Even though the global economy was expected to expand at a slower rate, the demand for energy and base metals from China as well as the demand for raw materials for bio-fuel production were likely to continue to increase. Therefore, global headline inflation and core inflation were not expected to converge in the near term.

[2/] Base metals include iron ore, nickel, lead, and aluminium

The MPC revised up the assumption on crude oil prices to reflect the most recent prices and the trend of oil demand and supply.

Recently, world crude oil prices increased much more rapidly than the MPC anticipated. Going forward, even though the slowdown in the major economies in the first half of 2008 would lead to lower demand for crude oil, prices were likely to remain high due to strong global demand, particularly from China and India. Meanwhile, the supply of crude oil tended to expand at a slower pace than demand because of higher costs of drilling and exploration, and a lower rate of success in discovering new oil. Furthermore, recent investment by OPEC countries did not focus on exploration of new oil fields. Oil supply was therefore expected to continue on its tightening trend in the upcoming periods. The MPC thus revised up the assumption on oil prices throughout the projection period together with the assumption on domestic retail oil prices.

Chart 5.3 Assumptions on Dubai oil price



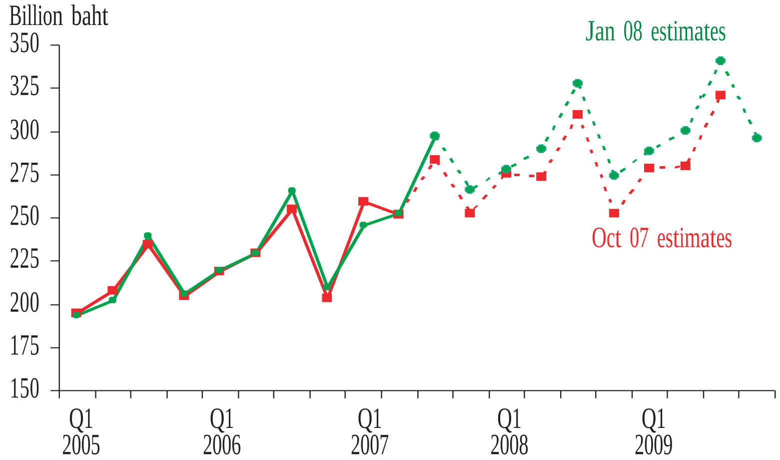
Source: Bank of Thailand estimates

Fiscal conditions

The MPC assumed general government consumption for fiscal years 2008-2009 to be 1,161.3 and 1,203.7 billion baht, respectively.

The MPC assessed that general government consumption in fiscal years 2008 and 2009 would be 1,161.3 and 1,203.7 billion baht, respectively, up from the previous assumptions of 1,111.0 and 1,131.9 billion baht, respectively. Such upward revisions resulted from a review of assumptions on the budget structure, which resulted in higher current expenditure. Moreover, the assumptions on subsidies and transfers to various funds were revised downward. As a result, current expenditure was higher than the amount assumed in the previous *Report*.

Chart 5.4 Assumptions on general government consumption

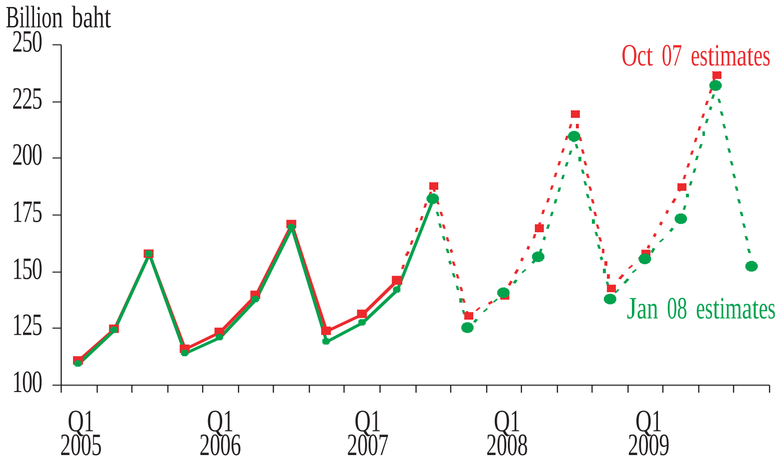


Source: Bank of Thailand estimates

With regards to public investment, consisting of investments by the general government and state-owned enterprises, the MPC revised the assumptions on the general government investment in fiscal years 2008 and 2009 downwards to 345.4 and 383.3 billion baht, respectively, down from the previous assumptions of 373.0 and 410.4 billion baht, respectively. Such downward revisions were due to upward revisions of assumptions on capital transfers to local governments and various funds where the assumed disbursement rate was lower than that of the central government. As a result, general government investment was lower than previously assumed.

The MPC assumed public investment for fiscal years 2008-2009 to be 631.8 and 698.4 billion baht, respectively.

Chart 5.5 Assumptions on public investment



Source: Bank of Thailand estimates

As for investment by state-owned enterprises in 2008 and 2009, the MPC maintained the previous assumptions of 286.4 And 315.0 billion baht, respectively. As a result, overall public investment in fiscal years 2008 and 2009 stood at 631.8 and 698.4 billion baht, respectively, both down from the previous assumptions of 659.4 and 725.4 billion baht, respectively.

Assumptions on minimum wages

The MPC revised assumptions on minimum wages upwards in line with the Central Wage Committeeís decision as well as inflation outlook.

The MPC revised the assumption on minimum wages for Bangkok and its surrounding provinces in 2008 upward from 191 baht per day in the previous year to 194 baht per day, higher than the previous assumption by 2 baht. The revision was consistent with the Central Wage Committee's decision in 12 November 2007, which became effective since 1 January 2008. As for 2009, the MPC assumed a further increase of approximately 3 per cent, in line with headline inflation outlook for 2008.

Assumptions on inventory accumulation

The MPC assumed that inventory accumulation over the next 8 quarters would be consistent with an economic recovery and domestic demand in particular, with an accumulation of inventory in some quarters. Under this assumption, inventory accumulation would have a positive contribution to GDP in some quarters.

Output and inflation projections

Output projection

Latest data from the NESDB showed that the Thai economy in 2007 Q3 grew by 4.9 per cent year-on-year, accelerating from the first two quarters of the year as a result of the recovery in private investment and consumption, particularly that of durable goods. Meanwhile, public spending accelerated and exports continued to expand well. As a result, during the first 3 quarters of 2007, the Thai economy grew by 4.5 per cent year-on-year.

Preliminary economic indicators for 2007 Q4 reflected a gradual firming up of domestic demand, both in private consumption and investment. An important factor supporting the recovery was the improvement in business and consumer sentiment following the referendum on the draft Constitution and the subsequent general election on 23 December 2007. This was reflected in a rise in the business sentiment index and a subsequent pickup in the consumer confidence index. Thus, the MPC assessed that domestic demand would continue to recover, going forward. However, such a recovery remained fragile given consumers' and investors' concerns over the world economic outlook, higher oil prices as well as clarity over the formation of the new government and continuation of policy. This had a particular impact on important investment projects that were delayed, resulting in a less-than-expected stimulus on private investment. Given the early stage of recovery of domestic demand, exports would remain a necessary engine of growth. In the previous period, export performance significantly exceeded expectations. Despite a stronger trend in the baht, exporters were able to adjust by seeking new export markets, adopting alternative price quotation currencies and increasing the use of instruments to manage exchange rate risk. As a result, exports continued to grow.

The outlook for the Thai economy over the next 8 quarters was similar to that in the previous *Report.* In other words, the MPC deemed that domestic demand would continue to recover in 2008, with private domestic demand assuming a greater role in driving the economy forward, while exports were expected to slow down in line with the previous assessment. However, the extent of such a slowdown could be greater than previously expected, given lower-than-expected growth of trading partners' economies and a stronger-than-expected trend in the baht, in line with regional currencies. Overall, the Thai economy in 2008 and 2009 was expected to accelerate from 2007. Moreover, a strengthening in domestic demand would ensure a more balanced growth momentum from private domestic demand, public spending and external demand, compared with last year where external demand played a very significant role while domestic demand remained subdued.

The incorporation of latest data from the NESDB and a review of the external and domestic environment led the MPC to revise forecasts of individual GDP components as follows.

Private consumption and investment were expected to be slightly higher than previously projected, partly as a result of a rather strong momentum towards the latter half of 2007.

Private consumption in 2008 was expected to be slightly higher than previously projected, driven by a strong momentum towards the end of 2007, according to latest indicators. Moreover, greater political clarity would help improve consumer confidence. On the back of monetary policy, which has become more accomodative for quite some time, private consumption was likely to accelerate by more than previously projected, particularly that of durable goods, which was rather subdued last year. However, although the higher-than-expected inflation outlook was unlikely to significantly affect consumers' purchasing power, it should still lead consumers to be more cautious in their spending on non-essential items. Overall, the MPC assessed that private consumption would grow at a slightly higher rate than previously projected and continue to expand in 2009.

Private investment in 2008 was expected to grow at a higher rate than previously projected, in line with actual data for 2007 Q3 which showed a higher-than-expected acceleration in private investment. Such a turnaround would provide momentum for private investment as well as the overall economy to recovery more quickly than expected. Moreover, an expected acceleration in public spending would help create a more conducive investment climate, thus providing another stimulus for private investment. However, exports that were expected to be lower than previously projected due to revisions of assumptions of trading partners' economic growth could affect the exports-related component of private investment. Nevertheless, such an impact was not expected to be large. Overall, the MPC viewed that private investment would grow at a higher rate than previously projected in 2008. As for 2009, given that large investment projects such as those relating to the production of Eco cars and those in support of the Power Development Plan were scheduled, private investment was expected to continue to accelerate from the previous year. Such an acceleration in private investment would be in line with an expansion in the value of BOI approved investments in recent periods.

In 2008, exports were expected to grow at a lower-than-expected rate. Meanwhile, imports were expected to grow at a similar rate to previous projections.

Exports of goods in 2008 were expected to expand by less than previously projected, in line with lower assumptions on trading partners' economic growth as a result of problems in the US subprime market. In addition, the baht was expected to be stronger in line with assumptions on the trend in regional currencies. In the previous period, however, exporters were able to make adjustments in order to minimize the impact of the baht appreciation, such that the effect on export volumes was less than previously projected. As a result, it was expected that exports should continue to grow, going forward. In addition, exports of services in 2008 were expected to grow at a rate similar to that previously projected. Despite lower-than-expected growth during 2007 Q3, preliminary indicators for the rest of the year reflected improvements in tourism in line with dissipating concerns over uncertainties. Moreover, the Tourism Authority of Thailand together with the private sector planned to adopt a new strategy focusing on inter-linkages with other destinations such as China, the host of the 2008 Olympic Games. The new strategy would also gear towards specific groups such as high-income tourists. Thus, the MPC assessed that exports of services should improve. As for 2009, exports of goods and services were expected to accelerate from 2008 in line with improvements in trading parters' GDP, as the US economy was expected to recover from problems in the subprime market.

Imports of goods and services in 2008 were expected to grow at a similar rate to that previously projected. Despite a clear sign of recovery in domestic demand, especially in investment that would lead to higher imports of machinery and parts, a lower-than-expected trend of export growth, coupled with higher import prices in line with rising oil and non-fuel commodity prices would cause import volume to be unchanged. As for 2009, the MPC viewed that imports would continue to accelerate largely in line with the outlook for a recovery in investment.

Compared to 2007, exports that were expected to slow down in 2008 while imports were projected to accelerate led the MPC to assess that the current account balance (including reinvested earnings) in 2008 would register a lower surplus compared to the previous year. The aforementioned surplus would continue to decline in 2009 due to a continued acceleration in imports in line with a recovery in domestic demand.

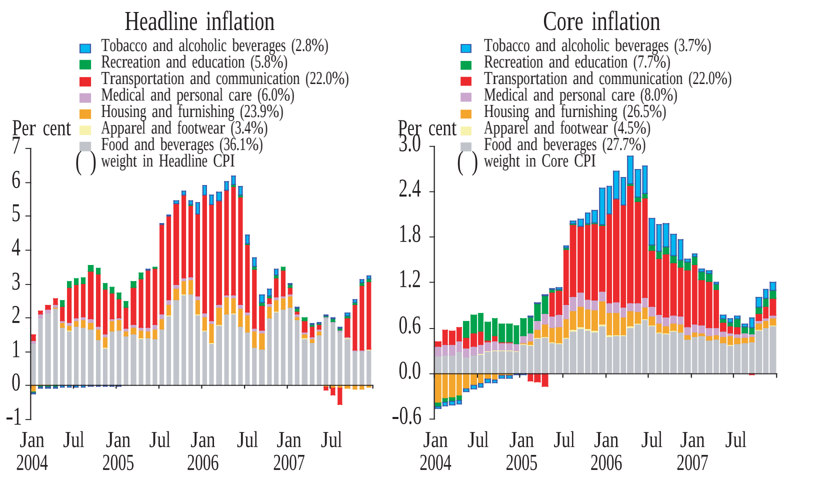
In 2008, the current account balance was expected to register a smaller surplus than the previous year. Such a surplus would continue to decline in 2009.

Inflation projection

Headline inflation in 2007 Q4 averaged at 2.9 per cent, higher than the MPC's projection in the previous *Report.* Meanwhile, core inflation stood at 1.1 per cent, as projected. The higher-than-expected headline inflation was a result of accelerating world oil prices, which resulted in a rise in seasonally adjusted headline inflation in October and November, in line with the continous upward adjustments in the prices of domestic retail oil as well as other goods and services, as a result of higher input and transportation costs. Although month-on-month seasonally adjusted headline inflation decelerated in December, it remained high compared with the average for the whole year.

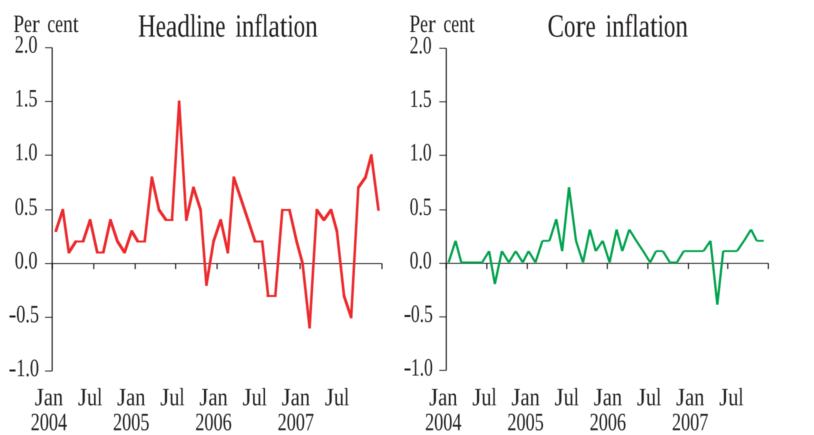
At the same time, month-on-month seasonally adjusted core inflation also accelerated from the previous quarter, reflecting higher pass-through of rising input costs, particularly in the categories of public

Chart 5.6 Contribution to headline and core inflation



Source: Trade and Economic Index Bureau, Ministry of Commerce, calculations by the Bank of Thailand

Chart 5.7 Month-on-month seasonally adjusted headline and core inflation



Source: Calculations by the Bank of Thailand transportation, vehicles, and food and beverages - excluding raw food. A number of these goods and services were categorized under the authorities' price administration measures, reflecting authorities' gradual allowance for price increases, given significantly higher production costs and that producers had been absorbing those costs for quite some time. Nevertheless, the authorities remained mindful in their decisions to allow for price increases so as not to significantly affect consumers' purchasing power. As a result, a gradual pass-through was observed for this cateogry of goods and services.

Both headline and core inflation in 2008 and 2009 were expected to be higher than previous projections.

Going forward until the end of the projection period, upward pressures that could cause inflation to edge higher derived mainly from the supply-side, namely prices of oil and LPG fuel, non-fuel commodities and farm produce, which increased in line with the trend in world prices. These higher input costs could be passed through to other goods and services, especially in a time of recovery in domestic demand because higher demand-side pressure would present a good opportunity for producers to raise prices. Meanwhile, the prices of goods and services under price administration measures were also expected to edge up given a significant rise in production costs. Moreover, the room for producers to cut costs in other areas became smaller compared with the previous period, when they were able to delay the pass-through to consumers. Thus, the MPC deemed that the pass-through for this category of goods and services would also continue to be higher. In this regard, goods and services whose prices were expected to rise significantly in 2008 included public transportation and travel services, electricity, food and beverages (both at home and away from home), milk, vegetable oil, sauce and condiments, as well as some cleaning products and personal care products.

Downward price pressures that could cause inflation to be lower in the short-term would emanate from the uncertainty surrounding the recovery in domestic demand. Particularly, should the political situation not improve after the formation of the new government, the recovery in private consumption could yet be postponed. As a result, pressure from the demand side as well as the pass-through would be lower. Moreover, a stronger-than-expected appreciation trend in the baht compared with the previous period would help ease some of the impact from the acceleration of world commodity prices.

From above, the MPC assessed that there were more upward price pressures than downward pressures, and overall, these pressures were higher than the levels projected in the previous *Report.* Thus, headline inflation in 2008 was expected to be significantly higher than the rate previously projected. Moreover, core inflation was also expected to be higher than the rate previously projected but its accleration would remain gradual, in line with the outlook for a steady recovery in domestic demand and the gradual increase in the prices of goods and services under the authorities' price administration measures.

It should be noted that headline inflation was expected to accelerate by more than core inflation in 2008 as pressures from the supply-side would have a direct impact on headline inflation. As these pressures subside in 2009, a slowdown in headline inflation should take place. On the other hand, core inflation should continue to rise steadily given that the pass-through of supply-side pressures to the prices of other goods and services would not happen immediately. Moreover, going forward, the expected rise in consumer spending would be another contributor to rising core inflation.

Assessment of risks

The output and inflation projections given above were based on assumptions that the MPC considered most plausible. Under these baseline assumptions, the Thai economy was expected to continue to expand robustly. At the same time, the MPC deemed that many risks that could affect the continuation of economic growth remained, from both internal and external sources. In the assessment of economic outlook over the next 8 quarters, the MPC gave consideration to risk factors that could affect the projections under various scenarios.

Risk factors in the output projection

The MPC deemed it possible that uncertainty with regards to world oil prices could still lead to a different picture of economic growth than in the baseline projection. Although assumptions for Dubai oil prices at 85.5 and 86.0 US dollars per barrel in 2008 and 2009 respectively were deemed most probable, oil prices could rise beyond these levels as a result of various factors. Such factors included tighter-than-expected supply conditions as a result of delays in increases of production capacity in both OPEC and non-OPEC oil producing countries, domestic unrest in oil producing countries in the Middle East and Africa, a depreciating trend in the US dollar that could result in speculative transactions in the market for oil futures, and higher-than-expected demand for oil should the extent of the world economic slowdown be milder than expected. Thus, the MPC revised its assumption on the Dubai oil price upward by 1 standard deviation from the baseline assumption as the worse case scenario to an average of 100.0 and 106.7 US dollars per barrel, respectively in 2008 and 2009.

Nevertheless, the MPC also deemed it possible that the demand for oil could be lower than expected if the slowdown in the world economy became deeper. Thus, in the better case scenario, the MPC used the assumption that the Dubai oil price would average at 78.2 and 75.7 US dollars per barrel in 2008 and 2009, respectively, a decline from the baseline scenario by 0.5 standard deviation compared with the 1 standard deviation increase used in the worse case scenario, given that the OPEC members were unlikely to allow prices to fall by too much. Overall, the MPC assessed that the downside risk from the worse case scenario would be more likely than the upside risk.

Another risk factor considered was consumer and business sentiment which still remained fragile. Despite signs of improvements after some unwinding of political uncertainties, there remained a chance that sentiment could worsen once again, should the political situation continue to deteriorate. This would result in a slower-than-expected recovery in domestic demand, and particularly in private investment. Thus, the MPC deemed such a scenario as a downside risk to economic growth. This view differed from that in the previous *Report* where sentiment was considered an upside risk.

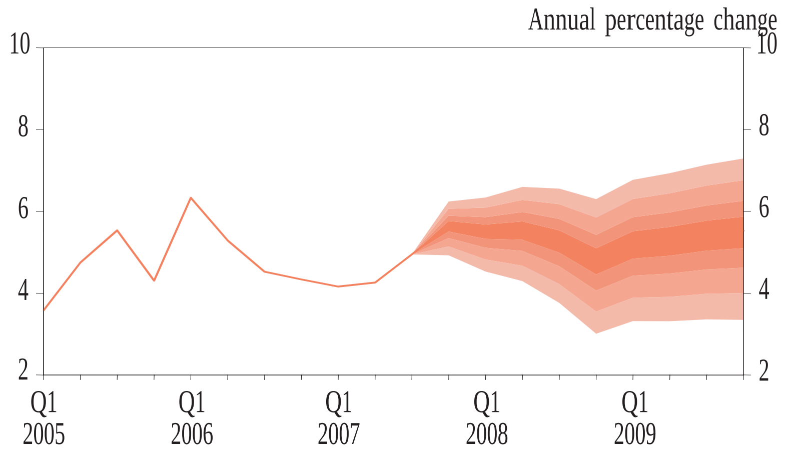
In addition, the MPC considered the possibility that the problems in the US subprime market could worsen and lead to a recession in the US economy and result in a wide-spread impact on trading partners' economies. In this scenario, trading partners' economic growth would slow down by more than the baseline projection and recovery would also be slower-than-expected. This would pose a downside risk to Thai exports of goods and services, resulting in a slower-than-expected economic recovery of the Thai economy. Moreover, during times of fragile sentiment, this could have a negative impact on private consumption and investment. At the same time, the MPC also deemed that it was possible that problems in the US subprime market could be less severe than expected in the baseline scenario given the genuine effort of various countries' authorities to tackle the problems. Such effort could help maintain business and consumer sentiment and as a result, the impact on the real economy could be limited. In this scenario, trading partners' economic growth would be higher than the rate projected in the baseline scenario, thus resulting in a positive impact on Thai exports. When coupled with stronger domestic demand, the Thai economy would be able to recover more quickly than expected. However, the MPC deemed that the downside risk to growth from problems in the US subprime market would be more likely than the upside risk.

A related risk factor would be the possibility that regional currencies as well as the baht could appreciate more rapidly than in the baseline scenario if the US economy slowed down by more than expected, as problems in the US subprime market led to portfolio re-allocation and speculative transactions in the money market. This would cause exports to be lower than the baseline projection, thus presenting a downside risk to overall growth.

On the other hand, a risk factor that could cause the Thai economy to grow at a higher rate than projected in the baseline scenario would be a higher-than-expected stimulus from the public sector as a direct result of public spending through policies aimed at promoting private investment. This would cause domestic demand to accelerate by more than the baseline projection.

The fan chart for GDP growth is wider and also skewed downward throughout the entire forecast period.

Chart 5.8 GDP growth forecast



Note: The fan chart covers 90 per cent of the probability distribution

Overall, the MPC gave more weight to the downside risk than the upside risk. While uncertainties increased from the previous *Report*, given that the extent of the problems in the US subprime market remained to be determined and oil prices became more volatile, the width of the fan chart for output growth was larger to reflect such uncertainties. The fan chart is also skewed downward throughout the entire forecast period.

Risk factors in the inflation projection

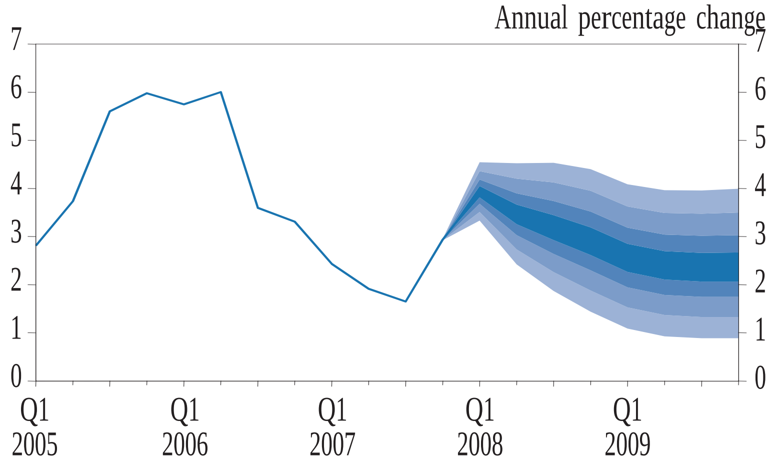
The MPC considered that upside risks that would cause inflation to be higher than the baseline projection could result mainly from higher-than-expected oil prices. In the event that oil prices accelerated markedly, such as in the worse case scenario, inflationary pressure would increase through higher costs of production, transportation and freight as well as higher inflation expectations. Moreover, prices of non-fuel commodities including farm produce could increase by more than the baseline assumption, for example, in a scenario where world demand remained high as a result of economic growth in China and India, or in the case where demand for alternative energy increased significantly. Moreover, delays in price adjustments in the previous period despite a steady rise in costs could imply higher-than-expected pressure on inflation going forward. Moreover, the recent increase in pass-through could accelerate further if input costs continued to rise or if domestic demand accelerated by more than the baseline projection. Other upside risks to inflation included the impact of the increase in excise tax rates for cigarettes and alcohol once the new ceilings became enforced and a possible increase in the Value Added Tax (VAT) rate that had long remained at 7 per cent. Although the plan for such tax increases still lacked clarity in terms of details and timing, should they become effective, the impact would be considerable.

Meanwhile, downside risks that could lead to tamer than expected price pressures included a slower-than-expected recovery in domestic demand and a stronger-than-expected baht, which would not only result in lower exports and overall economic growth but also lower import prices, exerting pressure on domestic producers to keep prices low to maintain competitiveness. Moreover, it was also deemed possible that oil prices could be lower than assumed in the baseline projection, in line with the aforementioned better case scenario, if trading partners' economies slowed down by more than expected. As a result, both the direct pressure on headline inflation and the indirect pressure on core inflation through production cost adjustments would decline.

Overall, the MPC deemed that the upside risks to headline inflation increased especially from oil prices. Thus, the fan chart for headline inflation is wider and also skewed upward. Moreover, the MPC viewed that there remained a risk of higher-than-expected pass-through and as a result, the fan chart for core inflation is skewed slightly upward.

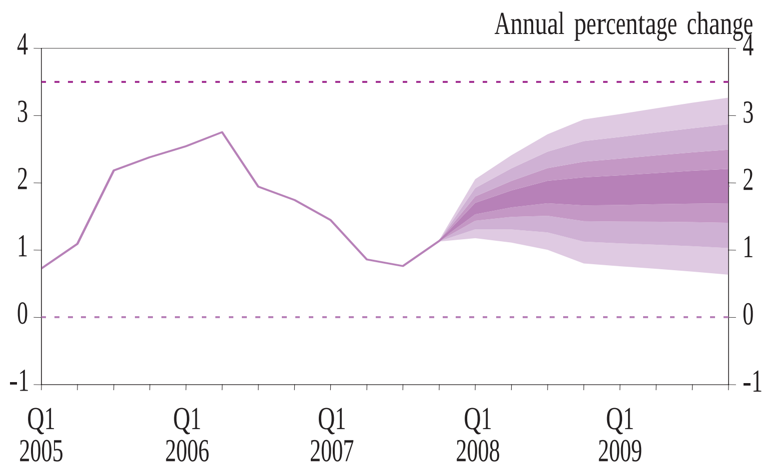
The fan chart for headline inflation is wider and also skewed upward to reflect risks from oil prices. Meanwhile, the fan chart for core inflation is skewed slightly upward from higher-than-expected pass-through.

Chart 5.9 Headline inflation forecast



Note: The fan chart covers 90 per cent of the probability distribution

Chart 5.10 Core inflation forecast



Note: The fan chart covers 90 per cent of the probability distribution

With regards to the forecast probability distribution, the output growth forecast for 2008 and 2009, obtained from averaging the darkest forecast range of each quarter over the year, was projected to be in the range between 4.5-6 per cent in both years, with a probability of approximately 93.4 and 80.8 per cent, respectively.

Output growth for 2008 and 2009 was projected to lie in the range of 4.5-6 per cent in both years.

Table 5.1 Probability distribution of GDP growth forecast

Unit: %	2007	2008				2009			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
< 2	0	0	0	0	1	0	0	0	0
2.0 - 2.5	0	0	0	0	1	1	1	1	1
2.5 - 3.0	0	0	0	1	4	2	2	2	2
3.0 - 3.5	0	0	0	2	7	5	4	4	4
3.5 - 4.0	0	1	2	6	12	9	8	7	7
4.0 - 4.5	1	4	7	13	17	13	12	11	10
4.5 - 5.0	7	16	16	19	19	17	16	15	14
5.0 - 5.5	33	32	26	23	17	19	18	17	16
5.5 - 6.0	44	31	26	19	12	16	16	16	16
6.0 - 6.5	14	13	16	11	6	11	11	13	13
6.5 - 7.0	1	2	5	4	2	5	6	8	9
> 7	0	0	1	1	1	3	4	6	8

Headline inflation in 2008 was projected to average between 2.8-4 per cent with a probability of approximately 92.3 per cent. As for 2009, the MPC deemed it more appropriate to use a larger range for headline inflation forecast of 1.8-3.3 per cent with a probability of approximately 89.1 per cent to reflect the volatility of headline inflation.

Headline inflation for 2008 and 2009 was projected to lie in the ranges of 2.8-4 and 1.8-3.3 per cent, respectively.

Table 5.2 Probability distribution of headline inflation forecast

Unit: %	2008				2009			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
< 0.5	0	0	0	0	1	2	2	2
0.5 - 1.0	0	0	0	1	3	4	4	4
1.0 - 1.5	0	0	1	4	8	10	10	10
1.5 - 2.0	0	1	5	10	15	17	17	17
2.0 - 2.5	0	5	12	17	20	21	21	20
2.5 - 3.0	0	17	21	22	21	20	19	19
3.0 - 3.5	10	30	24	20	16	14	14	14
3.5 - 4.0	47	28	19	14	10	8	8	8
4.0 - 4.5	37	15	11	8	4	3	3	4
4.5 - 5.0	5	4	4	3	1	1	1	1
> 5	0	1	1	1	0	0	0	0

Core inflation for 2008 and 2009 was projected to be in the ranges of 1.3-2.3 and 1.5-2.5 per cent, respectively.

Meanwhile, the MPC projected core inflation in 2008 to average in the range of 1.3-2.3 per cent, with a probability of approximately 94.3 per cent. As for 2009, the MPC used the same projection range of 1.5-2.5 per cent, with a probability of approximately 81.4 per cent.

Table 5.3 Probability distribution of core inflation forecast

Unit: %	2008				2009			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
< 0	0	0	0	0	0	0	1	1
0.0 - 0.5	0	0	0	2	2	2	2	3
0.5 - 1.0	1	3	4	7	8	8	8	8
1.0 - 1.5	32	23	19	19	19	18	17	17
1.5 - 2.0	59	47	36	29	28	26	25	24
2.0 - 2.5	8	24	29	26	25	24	24	23
2.5 - 3.0	0	3	10	13	13	14	15	15
3.0 - 3.5	0	0	1	4	4	5	6	7
> 3.5	0	0	0	1	1	1	2	2

Forecasts by research houses

Output growth projections for 2007 from various research houses polled by Reuters (Thailand) averaged at 4.4 per cent, higher than the previous quarter's poll as a result of better-than-expected recent economic data. As for 2008, most research houses viewed that the Thai economy would expand at a higher rate than the previous year. However, there remained concerns over the impact of problems in the US subprime market and higher oil prices. As a result, the Thai economy in 2008 was expected to expand at a rate of 4.8 per cent, down from the previous projection and up only modestly from 2007. This was partly because the forecasts were completed before the announcement of latest economic indicators that were better than expected.

Meanwhile, headline inflation forecasts for 2008 averaged at 3.0 per cent, up slightly from the previous forecast as a result of higher oil and commodity prices. The forecast was in line the projection in this *Report*.

Table 5.4 GDP growth forecasts by various research houses

	26 Sep 07		18 Dec 07	
	2007	2008	2007	2008
Capital Nomura	4.2	5.0	4.6	4.8
Phatra Securities	4.0	4.6	4.5	4.7
Kasikorn Research	4.3	5.3	4.5	4.5
Goldman Sachs	4.0	4.5	4.5	4.5
SCB	n.a.	n.a.	4.5	4.7
DBS Bank	4.3	5.6	4.3	5.6
Stanchart	3.8	4.8	4.2	4.7
Lehman Brothers	3.8	5.0	4.2	4.5
JP Morgan	4.2	5.1	4.2	5.1
TISCO Securities	4.2	4.8	n.a.	n.a.
Average	4.1	5.0	4.4	4.8
NESDB	4.0-4.5[1/]	n.a.	4.5[2/]	4.0-5.0[2/]

[1/] Estimated on 3 September 2007 when preliminary GDP figures for 2007 Q2 were released
[2/] Estimated on 3 December 2007 when preliminary GDP figures for 2007 Q3 were released
Source: Reuters and NESDB

Table 5.5 Headline inflation forecasts by various research houses

	26 Sep 07		18 Dec 07	
	2007	2008	2008	2009
Goldman Sachs	2.6	2.5	3.1	n.a.
Lehman Brothers	2.4	3.6	3.0	n.a.
JP Morgan	2.3	2.7	2.7	n.a.
Phatra Securities	2.6	2.7	3.0	n.a.
Stanchart	2.0	3.1	3.5	n.a.
Capital Nomura	1.9	2.2	3.0	n.a.
Kasikorn Research	1.7	2.3	3.5	n.a.
DBS Bank	1.7	2.2	2.4	n.a.
SCB	n.a.	n.a.	3.0	n.a.
TISCO Securities	2.5	2.8	n.a.	n.a.
Average	2.2	2.7	3.0	n.a.
NESDB	2.0-2.5[1/]	n.a.	3.0-3.5[2/]	n.a.

[1/] Estimated on 3 September 2007 when preliminary GDP figures for 2007 Q2 were released
[2/] Estimated on 3 December 2007 when preliminary GDP figures for 2007 Q3 were released
Source: Reuters and NESDB

6. Conclusion

Domestic demand in 2007 was quite subdued, but began to show signs of a recovery towards the second half of the year. The recovery was apparent both through a rebound in private investment and acceleration in private consumption. In addition, public spending increased as a result of accelerated disbursement, while external demand continued to expand robustly. As a result, the MPC expected overall growth of the Thai economy in 2007 to register at about 4.8%.

In 2008 and 2009, the MPC expected that the recovery in domestic demand would continue and would play a more prominent role in driving economic growth. Overall economic growth was expected to accelerate from 2007. However, uncertainties - arising particularly from external factors - would continue to persist, both from problems in the US subprime market and world oil prices.

At the same time, price pressures were likely to rise in line with world prices of oil and other commodities, as well as the increased pass-through to prices resulting from strengthened domestic demand. Headline inflation was therefore expected to accelerate in 2008, before moderating slightly in 2009, once supply side pressures began to recede. Core inflation was expected to be on a rising trend, but at a slower pace than headline inflation. However, due to the lag in the pass-through from higher costs, any pass-through was unlikely to be complete given the strong degree of competition among producers. In addition, some price administration measures still remained in place.

Despite the acceleration in core inflation, the MPC assessed that core inflation would remain within the target range throughout the next 8 quarters. In addition, the recovery in domestic demand was only at an early stage, while external demand was expected to moderate, under an environment of increased uncertainty surrounding the risks to growth. In the meeting on 4 December 2007 and 16 January 2008, the MPC decided to maintain the 1-day repurchase rate at 3.25 per cent per annum to support continued economic recovery, while continuing to monitor the various risks closely going forward.

Report: "Economic/Business Information Exchange Programme Between the Bank of Thailand and the Business Sector"

As of 28 December 2007

Overall summary

From the Economic/Business Information Exchange Programme between the Bank of Thailand and 99 business firms throughout the country in 2007 Q4, most businesses revealed that overall sales improved slightly from the previous quarter. While private investment began to recover, some businesses still delayed their investment plans to wait for a clearer economic and political direction at the beginning of 2008. Overall business costs continued to increase mainly as a result of rising oil prices, while price adjustments of goods and services remained limited. In 2008, businesses believed that domestic demand, both in consumption and investment, would show clearer signs of recovery given that the post-election political situation went smoothly as expected.

- Private consumption. Overall private consumption showed clearer signs of improvement from the previous quarter, due to the festive season during the year-end. In addition, a more distinctive political direction also led to stronger confidence and higher consumer spending. Going forward, businesses expected that private consumption in 2008 would grow at a higher rate than in 2007 provided that there would be no additional risk factors affecting consumer confidence.
- Private investment. Private investment showed signs of a slight improvement this quarter, reflected in a rise in the number of both Thai and foreign investors who expressed interest in investing in the industrial zones. In addition, large businesses continued to invest and showed greater interest in expanding abroad. Overall, businesses indicated their readiness to invest in 2008, which would gradually stimulate investment momentum over the coming periods. However, some businesses remained concerned about the economic and political direction, and would wait for greater clarity of economic policies and economic stimulus measures under the new government.
- Exports. Overall exports continued to expand well in line with robust export performance in plastic and chemical industries, paper pulp, beverages, and processed agricultural products. Meanwhile, the electronics and automobile parts industries received new export orders in this quarter, given robust external demand. In addition, Thailand's competitive advantage in terms of product quality enabled Thai exporters to expand while maintaining their existing price levels. The frozen food industry was affected only marginally by the strengthening of the baht, given some room to negotiate and adjust prices with customers.
- Costs and Prices. Overall business costs still continued to rise, driven mainly by higher oil prices and transportation costs. However, the adjustment of prices was still limited due to intense competition and low purchasing power, which consequently brought about a continuous decline in profit margins. Businesses were therefore forced to adjust by increasing their productive efficiency, minimizing operating costs, and expanding to new domestic and foreign markets.
- Real estate market. On the whole, the real estate market continued to decline from the previous quarter due to the continued slowdown in home buying and more prudent credit approval policies by commercial banks. In addition, the abundant supply of new homes in the market in the past two years exceeded real demand, thus weakening overall market prices. Nonetheless, apartment and condominium sales still expanded favorably, especially in downtown areas close to the sky-train route. In 2008, the real estate market was expected to revive gradually due to the downward trend of interest rates in 2007. However, more prudent credit approval policies and the abolition of measures to reduce property transfer fees by the Ministry of Finance could inevitably result in the continued sluggishness of the property market.
- Business limitations and risk factors. Economic and political uncertainties remained as major business limitations and risk factors in this quarter. At the same time, the rise in the price of oil and raw materials as well as transportation costs also led to the continued decline in profit margins. This would eventually force businesses to cut costs, since price administration measures imposed by the government restricted businesses from passing on these additional costs onto consumers.

Appendix: Macroeconometric model[1/]

The Bank of Thailand's macroeconometric model (BOTMM) is an economic forecasting tool, consisting of 25 behavioural equations and 44 identities. The BOTMM presents to the Monetary Policy Committee (MPC) an important tool for economic forecasting. The model is used to analyse the response of the economy to various exogenous shocks and policy changes. It also assists the MPC in formulating the optimal policy to achieve the goals of price stability and sustainable economic growth in the long run.

Improving the model

In this *Report,* the BOTMM was revised by incorporating the most recent published data, particularly the quarterly GDP figures of 2007 Q3 released by the NESDB on 3 December 2007. Other notable changes made to the model since the October 2007 *Report* are as follows.

1. The equation for private investment at 1988 constant prices (equation 1.5) was adjusted such that the real effective exchange rate index (REER) was used to represent the cost of raw material imports instead of the Thai baht per US dollar exchange rate index (FX88) so that imports quoted in non-US dollar terms were more fully captured.

2. The equation for the exchange rate (equation 3.6) was revised such that the average exchange rate (in log terms) of the current quarter and the previous quarter was used as a proxy for the one-period ahead expected exchange rate (FXEX), instead of using just the previous quarter's exchange rate alone. Moreover, in the equation for PRESSURE, a coefficient of 1 was assigned to REGIONFX and that of 0.1 was assigned to the ratio of the current account balance to GDP at current prices in order to capture the dynamics of the exchange rate as a result of movements in the aforementioned variables. The adjustments

[1/] The Bank of Thailand's macroeconometric model was first published in the July 2000 *Report.* Revisions to the model were noted in subsequent *Reports.*

better reflect our understanding of the Thai economy in the previous period.

3. Along with the announcement of 2007 Q3 GDP, the NESDB also revised the series for the government consumption deflator partly as a result of latest data on salary increases for each level of civil servants in 2005 and 2006. In addition, the revision also corrected for the large disbursement of overdue supplemental payments for academic standing for government-employed teachers and other civil servants in the educational field in 2007 Q1 to an accrual basis, since Cabinet approval was effective since 2006 Q1. As a result, in the equation for the government consumption deflator (equation 5.12), the dummy variable SALARY which was formerly used to represent 3 different periods where changes in the salary structure occurred (namely 1994 Q4, 2004 Q2 and 2007 Q1), was replaced with 2 dummy variables to represent 2 types of changes in the salary structure. Subsequently, SALARY1 reflects the salary structure change during 1994 Q4 - 2004 Q1 and SALARY2 reflects that during 2004 Q2 to 2007 Q3.

Effect of variations in the exchange rate and crude oil price on the Thai economy

The model in this *Report* was used to analyze the effect of variations in the exchange rate and the crude oil price on the Thai economy. Table A.1 shows that a one-percent depreciation in the exchange rate (baht per US dollar) would increase core inflation, headline inflation, and economic growth by 0.04, 0.04, and 0.35 per cent on average within a year, respectively.

Moreover, a one-percent increase in the Dubai crude oil price (US dollars per barrel of Dubai crude oil) would affect core inflation, headline inflation, and economic growth by 0.01, 0.04, and -0.03 per cent on average within a year, respectively.

Table A.1 Summary of the effect of variations in the exchange rate and crude oil price

(%)

	Effect on the Thai economy within 1 year (on average)	
	1% depreciation in the exchange rate (baht per US dollar)	1% increase in crude oil price
Core inflation	0.04	0.01
Headline inflation	0.04	0.04
Economic growth	0.35	-0.03

Source: Macroeconometric model, Bank of Thailand

Corporate and household sector models

The corporate and household sector models are tools developed by the BOT to help assess the financial conditions of the Thai corporate and household sectors. The assessment is part of the effort to ensure financial stability, which itself, in turn, is closely intertwined with monetary stability and long-term economic growth, the main objectives of monetary policy under inflation targeting. In this *Report*, the BOT has revised the corporate and household sector models using the latest released data, especially those pertaining to listed companies, household credits, and GDP.

Bank of Thailand's Macroeconometric Model (Core Model)[2/]

1. Real sector

1.1 Private durable goods consumption at 1988 constant prices

$$\Delta\ln(CPR1sa) = \underset{(-2.99)}{-0.021}*\Delta(MLR-CINFEX) + \underset{(4.06)}{0.772}*\Delta\ln(GDPRsa(-1)*(1-RH(-1))) - \underset{(-1.77)}{0.201}*ecmCPR1(-1)$$

Adjusted R-Squared = 0.43 S.E. of regression = 0.0249 LM(2) : 1.95 (0.16)

$$ecmCPR1 = \ln(CPR1sa) - (0.309*\ln(GDPRsa*(1-RH)) - 0.041*(MLR(-1)-CINFEX(-1)) + 0.217*\ln(WEALTHsa*100/COREsa)) + 0.261*\ln(PLANDTHsa*100/COREsa)$$

1.2 Private non-durable goods consumption at 1988 constant prices

$$\Delta\ln(CPR2sa) = \underset{(4.44)}{0.011} + \underset{(5.89)}{0.408}*\Delta\ln(GDPRsa*(1-RH)) - \underset{(-3.58)}{0.665}*\Delta\ln(CPIsa) - \underset{(-5.44)}{0.442}*ecmCPR2(-1)$$

Adjusted R-Squared = 0.63 S.E. of regression = 0.0100 LM(2) : 1.44 (0.25)

$$ecmCPR2 = \ln(CPR2sa) - (0.864*\ln(GDPRsa*(1-RH)) - 0.006*(RD3M-CINFEX))$$

1.3 Total private consumption at 1988 constant prices

$$CPR = CPR1 + CPR2$$

1.4 Asset value

$$WEALTH = MBROAD + BMCAP$$

1.5 Private investment at 1988 constant prices

$$\Delta\ln(IPRsa) = \underset{(7.96)}{2.508}*\Delta\ln(GDPRsa/GDPR\_HSM) + \underset{(5.83)}{1.591}*\Delta\ln(GDPRsa(-1)) + \underset{(4.16)}{0.373}*\Delta\ln(REER) - \underset{(-2.68)}{0.078}*ecmIPR(-1)$$

Adjusted R-Squared = 0.86 S.E. of regression = 0.0285 LM(2) : 0.50 (0.61)

$$ecmIPR = \ln(IPRsa) - (5.596 - 0.115*(MLR(-1) - CINFEX(-1)) + 3.482*\Delta\ln(PCREDITsa/CPIsa)$$

1.6 Government consumption at 1988 constant prices

$$CGOVR = CGOVN/PGCON$$

1.7 Public investment at 1988 constant prices

$$IPUB = IPUBN/PIFX$$

1.8 Exports of goods and services at 1988 constant prices

$$\Delta\ln(XRsa) = \underset{(7.07)}{2.488}*\Delta\ln(TPGDPsa) - \underset{(-3.62)}{0.632}*\Delta\ln(REER) - \underset{(-4.36)}{0.653}*ecmXR(-1)$$

Adjusted R-Squared = 0.55 S.E. of regression = 0.0232 LM(2) : 0.99 (0.38)

$$ecmXR = \ln(XRsa) - (-1.823 + 2.172*\ln(TPGDPsa) - 0.268*\ln(PX\$sa) - 0.156*\ln(REER))$$

1.8.1 Exports of goods at 1988 constant prices

$$XGR = RXGR*XR$$

1.8.2 Exports of services at 1988 constant prices

$$XSR = RXSR*XR$$

[2/] ln = natural logarithms
sa = seasonally adjusted
ecm = error correction term
The numbers in parentheses below coefficients are the t-statistics.
LM(2) is the test for second-order serial correlation in the residuals (with *p*-value in parentheses).

1.9 Imports of goods and services at 1988 constant prices

Δln(MRsa) = 1.109*Δln(DDsa) + 0.600*Δln(XRsa) - 0.232*Δln((PM$sa*FX88)/CPIsa) - 0.251*ecmMR(-1)
(11.14) (6.59) (-3.29) (-2.87)

Adjusted R-Squared = 0.78 S.E. of regression = 0.0263 LM(2) : 0.99 (0.38)

ecmMR = ln(MRsa) - (-3.471 + 0.985*ln(DDsa) + 0.483*ln(XRsa) - 0.202*ln((PM$sa*FX88)/CPIsa))

1.9.1 Imports of goods at 1988 constant prices

MGR = RMGR*MR

1.9.2 Imports of services at 1988 constant prices

MSR = RMSR*MR

1.10 Gross domestic product at 1988 constant prices

GDPR = CPR + CGOVR + IPR + IPUB + (XR - MR) + OTHGDP

1.11 Gross domestic product at current market prices

GDPN = ((CPR*CPI) + (CGOVR*PGCON) + (IPR*PIP) + (IPUB*PIFX) + ((XR*PX$*FX88/100) - (MR*PM$*FX88/100)) + (OTHGDP*POTHGDP))/100

1.12 Domestic demand

DD = GDPR - XR + MR

2. Government sector

2.1 Government revenue

GREV = TAXREV + OTHREV

2.2 Tax revenue

TAXREV = TD + TIND

2.3 Direct tax

TD = TH + TC
TH = RH*GDPN
TC = RC*GDPN

2.4 Indirect tax

TIND = TVAT + TEXC + OTHTIND
TVAT = RVAT*(CPR*CPI/100)
TEXC = REXC*(CPR*CPI/100)
OTHTIND = ROTHTIND*(CPR*CPI/100)

2.5 Government cash balance

GCB = GREV - (GCURRENT + GCAPITAL) + NONBUDGET

3. External sector

3.1 Current account

CURRENT$ = (((XGR*PXG$) - (MGR*PMG$)) + ((XSR*PXS$) - (MSR*PMS$)))/(25.29[3/]*100)
CURRENTB = CURRENT$*FX

[3/] The Baht/USD exchange rate in 1988 is 25.29.

3.2 Capital and financial account

CAPITAL$ = CAPITAL$PRI + OTHCAP$

CAPITALB = CAPITAL$*FX

3.3 Balance of payments

BPB = CAPITAL$*FX + CURRENT$*FX + OTHBP

BP$ = BPB/FX

3.4 International reserves

RESERVE = BP$ + RESERVE(-1)

3.5 Net foreign assets

NFA = NFA(-1) + BPB + OTHNFA

3.6 Exchange rate

ln(FX88) = ln(FXEX) + ln(1+FEDFUND/400) - ln(1+RP1D/400) + PRESSURE

FXEX = 0.5*ln(FX88) + 0.5*ln(FX88(-1))

PRESSURE = Δln(REGIONFX) - 0.1*Δ(CURRENTB(-1)/GDPN(-1))

FX = (FX88*25.29[3/])/100

NEER = TPFX*100/FX94

REER = NEER/(TPCPI/CPI*100/73.43)

3.7 Net flows of private financial account

CAPITAL$PRI = 0.661*Δ(RP1D(-1)-FEDFUND(-1)) - 0.344*CURRENT$ + 26.58*Δln(GDPRsa(-1)) + 0.455*CAPITAL$PRI(-1)
(3.61) (-2.91) (1.64) (4.09)

Adjusted R-Squared = 0.72 S.E. of regression = 1.0128 LM(2) : 0.53 (0.59)

4. Monetary sector

4.1 Three-month deposit rate

ΔRD3M = 0.508*ΔRP1D + 0.401*ΔRD3M(-1)
(3.69) (3.06)

Adjusted R-Squared = 0.58 S.E. of regression = 0.2513 LM(2) : 2.17 (0.13)

4.2 Minimum lending rate

ΔMLR = 0.645*ΔRD3M
(9.33)

Adjusted R-Squared = 0.74 S.E. of regression = 0.1483 LM(2) : 0.03 (0.97)

4.3 Private credit

Δln(PCREDITsa) = - 0.002*MLR + 0.596*Δln(GDPNsa(-1)) - 0.047*Δln(NPL(-2)) + 0.699*Δln(PCREDITsa(-1))
(-3.15) (3.33) (-3.49) (7.30)

Adjusted R-Squared = 0.73 S.E. of regression = 0.0135 LM(2) : 1.42 (0.26)

4.4 Net claims on government

ΔCLAIMG = - 0.484*(GCB-FINB)
(-6.74)

Adjusted R-Squared = 0.50 S.E. of regression = 41.75 LM(2) : 0.06 (0.94)

[3/] The Baht/USD exchange rate in 1988 is 25.29.

4.5 Money supply

$MBROAD^S$ = NFA + CLAIMG + PCREDIT+ OTHMBROAD

$\ln(MBROAD^D sa*100/CPIsa) = 1.606 + 0.124*\ln(GDPRsa) - 0.004*(RD3M(-1) - CINFLAT(-1)) + 0.704*\ln(MBROAD^D sa(-1)*100/CPIsa(-1))$

(2.51) (2.08) (-2.45) (5.62)

Adjusted R-Squared = 0.99 S.E. of regression = 0.0077 LM(2) : 1.61 (0.22)

4.6 Securities value

$\Delta\ln(BMCAP) = 0.0004*\Delta(CAPITAL\$*FX) + 2.271*\Delta\ln(GDPRsa) - 0.108*\Delta(MLR) - 0.514*ecmBMCAP(-1)$

(2.13) (2.41) (-2.75) (-3.46)

Adjusted R-Squared = 0.36 S.E. of regression = 0.0765 LM(2) : 0.92 (0.41)

$ecmBMCAP = \ln(BMCAP) - (-15.377 + 0.0004*(CAPITAL\$*FX) + 3.558*\ln(GDPRsa) - 0.004*MLR)$

5. Price index

5.1 Core consumer price index

$CINFLAT = 2.813*\ln(GDPRsa/GDPR\_HSM) + 0.829*CINFLAT(-1) + 0.140*(((PPI/PPI(-4)-1)*100)*DUMMY\_PRE00Q3)$

(2.59) (31.07) (8.05)

$+ 0.055*(((PPI/PPI(-4)-1)*100)*DUMMY\_POST00Q3)$

(3.49)

Adjusted R-Squared = 0.96 S.E. of regression = 0.4615 LM(2) : 0.12 (0.89)

5.2 Producer price index

$\Delta\ln(PPIsa) = 0.144*\Delta\ln(RPPIsa) + 0.231*\Delta\ln(FARMPRICEsa) + 0.072*\Delta\ln(PM\$sa*FX88) - 0.251*ecmPPI(-1)$

(5.73) (6.06) (2.67) (-2.99)

Adjusted R-Squared = 0.67 S.E. of regression = 0.0104 LM(2) : 1.01 (0.37)

$ecmPPI = \ln(PPIsa) - (0.147*\ln(RPPIsa) + 0.243*\ln(FARMPRICEsa) + 0.151*\ln(PM\$sa*FX88) + 0.132*(\ln AVGEARNsa))$

5.3 Average earnings

$\Delta\ln(AVGEARNsa) = 0.295*\Delta\ln(MINWAGE) + 0.875*\Delta\ln(CPIsa) - 0.203*ecmAVGEARN(-1)$

(3.11) (5.60) (-2.44)

Adjusted R-Squared = 0.31 S.E. of regression = 0.0120 LM(2) : 0.54 (0.59)

$ecmAVGEARN = \ln(AVGEARNsa) - (2.487 + 0.746*\ln(MINWAGE(-1)) + 0.546*\ln(CPIsa))$

5.4 Energy price index

$\Delta\ln(CPIENsa) = 0.563*\Delta\ln(RPPIsa) - 0.209*ecmCPIEN(-1)$

(14.86) (-3.18)

Adjusted R-Squared = 0.74 S.E. of regression = 0.0173 LM(2) : 0.50 (0.61)

$ecmCPIEN = \ln(CPIENsa) - (1.117 + 0.786*\ln(RPPIsa))$

5.5 Retail petroleum price index

$\Delta\ln(RPPIsa) = 0.352*\Delta\ln(DUBAIsa) + 0.395*\Delta\ln(FX88) + 0.237*\Delta\ln(RPPIsa(-1)) - 0.255*ecmRPPI(-1)$

(9.72) (5.74) (3.41) (-3.81)

Adjusted R-Squared = 0.72 S.E. of regression = 0.0286 LM(2) : 1.41 (0.25)

$ecmRPPI = \ln(RPPIsa) - (-0.332 + 0.605*\ln(DUBAIsa) + 0.690*\ln(FX88))$

5.6 Raw food price index

$\Delta\ln(CPIRFOODsa) = 0.008 + 0.326*\Delta\ln(FARMPRICEsa) - 0.113*ecmCPIRFOOD(-1)$

(3.23) (5.56) (-3.03)

Adjusted R-Squared = 0.43 S.E. of regression = 0.0164 LM(2) : 1.18 (0.32)

$ecmCPIRFOOD = \ln(CPIRFOODsa) - (1.498 + 0.729*\ln(FARMPRICEsa))$

5.7 Farm price index (12 main products)

$$\Delta\ln(FARMPRICE\_12sa) = \underset{(9.19)}{1.038}*\Delta\ln(WFP\_12sa) + \underset{(8.18)}{0.619}*\Delta\ln(FX88) - \underset{(-4.14)}{0.352}*ecmFARMPRICE\_12(-1)$$

Adjusted R-Squared = 0.68 S.E. of regression = 0.0316 LM(2) : 0.30 (0.74)

ecmFARMPRICE_12 = ln(FARMPRICE_12sa) - (-5.707 + 1.188*ln(WFP_12sa) + 1.066*ln(FX88))

5.8 Farm price index

FARMPRICE = (WFARMPRICE_12*FARMPRICE_12) + (WFARMPRICE_OTH*FARMPRICE_OTH)

5.9 Headline consumer price index

CPI = ((1-WEN-WRFOOD)*CORE) + (WEN*CPIEN) + (WRFOOD*CPIRFOOD)

5.10 Private investment deflator

$$\Delta\ln(PIPsa) = \underset{(5.01)}{0.739}*\Delta\ln(PPIsa) - \underset{(-3.90)}{0.347}*ecmPIP(-1)$$

Adjusted R-Squared = 0.43 S.E. of regression = 0.0208 LM(2) : 0.48 (0.62)

ecmPIP = ln(PIPsa) - (1.997 + 0.952*ln(PPIsa) - 0.277*ln(NEER))

5.11 Public investment deflator

$$\Delta\ln(PIFXsa) = \underset{(5.86)}{0.569}*\Delta\ln(PPIsa) - \underset{(-3.96)}{0.304}*ecmPIFX(-1)$$

Adjusted R-Squared = 0.33 S.E. of regression = 0.0140 LM(2) : 2.37 (0.10)

ecmPIFX = ln(PIFXsa) - (2.023 + 0.890*ln(PPIsa) - 0.217*ln(NEER))

5.12 Government consumption deflator

$$\Delta\ln(PGCONsa) = \underset{(3.53)}{0.574}*\Delta\ln(CPIsa) + \underset{(5.44)}{0.078}*\Delta SALARY1 + \underset{(7.31)}{0.148}*\Delta SALARY2 - \underset{(-2.30)}{0.198}*ecmPGCON(-1)$$

Adjusted R-Squared = 0.45 S.E. of regression = 0.0142 LM(2) : 2.99 (0.06)

ecmPGCON = ln(PGCONsa) - (1.335 + 0.764*ln(CPIsa) + 0.043*SALARY1 + 0.160*SALARY2)

5.13 Export price deflator

$$\Delta\ln(PX\$sa) = \underset{(3.06)}{0.203}*\Delta\ln(PM\$sa) + \underset{(3.56)}{0.717}*\Delta\ln(TPGDPsa) - \underset{(-5.32)}{0.219}*\Delta\ln(FX88) - \underset{(-3.61)}{0.221}*ecmPX\$(-1)$$

Adjusted R-Squared = 0.68 S.E. of regression = 0.0163 LM(2) : 1.51 (0.23)

ecmPX$ = ln(PX$sa) - (3.198 + 0.391*ln(PW_NONFsa) + 0.169*ln(MUVsa) - 0.201*ln(FX88))

5.13.1 Export price deflator for services

PXS$sa = PXS$sa(-4)*((CPIsa/FX88)/(CPIsa(-4)/FX88(-4)))

5.13.2 Export price deflator for goods

PXG$sa = (PX$sa - RXSR*PXS$sa)/RXGR

5.14 Import price deflator

$$\Delta\ln(PM\$sa) = \underset{(3.69)}{0.372}*\Delta\ln(PW\_NONFsa) - \underset{(-4.67)}{0.543}*ecmPM\$(-1)$$

Adjusted R-Squared = 0.38 S.E. of regression = 0.0294 LM(2) : 0.62 (0.54)

ecmPM$ = ln(PM$sa) - (1.463 + 0.276*ln(PW_NONFsa(-1)) + 0.405*ln(MUVsa(-1)) + 0.080*ln(DUBAIsa))

5.14.1 Import price deflator for services

PMS$sa = PMS$sa(-4)*((TPCPIsa*FX94/NEER)/(TPCPIsa(-4)*FX88(-4)/NEER(-4)))

5.14.2 Import price deflator for goods

PMG$sa = (PMS$sa - RMSR*PMS$sa)/RMGR

5.15 GDP deflator

$$PGDP = GDPN / GDPR*100$$

5.16 Inflation expectations

$$CINFEX = 0.25*CINFLAT(-1) + 0.25*CINFLAT + 0.50*CINFLAT(4)$$

5.17 Housing price index

$$\ln(PLANDTHsa) = \underset{(-2.91)}{- 0.006}*(MLR(-1) - CINFEX(-1)) + \underset{(3.27)}{0.533}*\ln(PLANDTHsa(-1)) + \underset{(2.91)}{0.477}*\ln(PLANDTHsa(-2))$$

Adjusted R-Squared = 0.97 S.E. of regression = 0.0124 LM(2) : 1.24 (0.30)

6. Corporate sector model

6.1 Sales, cost of goods sold, profits

6.1.1 Sales

$$\ln(SALESsa) = \underset{(7.94)}{1.826}*\Delta\ln(GDPNsa) - \underset{(-3.13)}{0.285}*ecmSALESsa(-1)$$

Adjusted R-Squared = 0.33 S.E. of regression = 0.0414 LM(2) : 0.19 (0.83)

$$ecmSALES = \ln(SALESsa) - (-10.295 + 2.319*\ln(GDPNsa) - 0.033*(MLR - CINFEX))$$

6.1.2 Cost of goods sold

$$\ln(COGSsa) = \underset{(-4.28)}{-1.941} + \underset{(25.71)}{0.931}*\ln(SALESsa) + \underset{(3.17)}{0.452}*\ln(PPIsa)$$

Adjusted R-Squared = 0.99 S.E. of regression = 0.0340 LM(2) : 0.75 (0.48)

6.1.3 Operating profits

$$EBIT = SALES - COGS - OTHER$$

6.1.4 Net profits

$$NI = EBIT - INT - TAX - EXTRA$$

6.2 Assets, equity, liabilities

6.2.1 Assets

$$\Delta\ln(ASSETsa) = \underset{(-1.72)}{- 0.031}*\Delta(MLR(-3) - CINFEX(-3)) + \underset{(2.74)}{0.256}*\Delta\ln(SALESsa(-1)) - \underset{(-3.07)}{0.519}*ecmASSET(-1)$$

Adjusted R-Squared = 0.74 S.E. of regression = 0.0340 LM(2) : 0.53 (0.60)

$$ecmASSET = \ln(ASSETsa) - (5.091 - 0.023*(MLR(-4) - CINFEX(-4)) + 0.497*\ln(SALESsa(-2)))$$

6.2.2 Equity

$$\Delta\ln(EQUITYsa) = \underset{(2.67)}{0.714}*\Delta\ln(GDPNsa(-2)) - \underset{(-4.51)}{0.608}*\Delta\ln(FX88) + \underset{(7.32)}{0.001}*\Delta(NI) + \underset{(2.46)}{0.032}*DUM01Q4 - \underset{(-2.52)}{0.171}*ecmEQUITY(-1)$$

Adjusted R-Squared = 0.61 S.E. of regression = 0.0532 LM(2) : 1.57 (0.22)

$$ecmEQUITY = \ln(EQUITYsa) - (1.659*\ln(GDPNsa) + 0.403*DUM01Q4 + 0.015*(MLR(-1) - FEDFUND(-1)) - 1.074*\ln(FX88))$$

6.2.3 Liabilities

$$DEBT = ASSET - EQUITY$$

6.3 Debt burden and debt-service ability

6.3.1 Debt to equity ratio

DE = DEBT/EQUITY

6.3.2 Interest expenses

ln(INTsa)= - 7.328 + 1.374*ln(DEBTsa(-1)) + 0.019*MLR(-1) - 0.551*DUM01Q4

6.3.3 Interest coverage ratio

ICR = EBIT/INT

7. Household model

7.1 Liabilities

7.1.1 Banks' lending to household

Δln(LOANHHTsa) = - 0.009*ΔMLR(-1) + 0.439*Δln(CPRsa(-4)) + 0.787*Δln(LOANHHTsa(-1))

(-2.11) (3.02) (11.21)

Adjusted R-Squared = 0.67 S.E. of regression = 0.0185 LM(2) : 1.29 (0.29)

7.2 Debt repayment capacity

7.2.1 Household interest payments

INTHH = (MLR/100)*LOANHHT

7.2.2 Ratio of interest payments to income after tax

IGEARHH = INTHH/(GDPRsa*(1-RH))* 100

List of variables

Dependent variables

AVGEARN	Average earnings (baht/month)
BMCAP	Securities value (billion baht)
BPB, BP$	Balance of payments (billion baht, billion US dollars)
CAPITALB, CAPITAL$	Capital and financial account (billion baht, billion US dollars)
CAPITAL$PRI	Net flows of private financial account (billion US dollars)
CGOVR	Government consumption at 1988 constant prices (billion baht)
CINFEX	Inflation expectations
CLAIMG	Net claims on government (billion baht)
CORE, CINFLAT	Core consumer price index (CPI excluding raw food and energy prices) (2002 = 100), Core inflation (per cent)
CPI	Headline consumer price index (2002 = 100)
CPIEN	Energy price index (2002 = 100)
CPIRFOOD	Raw food price index (2002 = 100)
CPR	Total private consumption at 1988 constant prices (billion baht)
CPR1	Private durable goods consumption at 1988 constant prices (including transport equipment, electrical machinery, machinery and equipment, furniture, rubber products, and glass and plastic products) (billion baht)
CPR2	Private non-durable goods consumption at 1988 constant prices (including food products, beverages, energy, and services) (billion baht)
CURRENTB, CURRENT$	Current account balance (billion baht, billion US dollars)
DD	Domestic demand at 1988 constant prices (billion baht)
FARMPRICE	Farm price index (1995 = 100)
FARMPRICE_12	Farm price index (12 main products of Thailand) (1995 = 100)
FX	Exchange rate (baht/US dollar)
FX88	Exchange rate index (1988 = 100)
FX94	Exchange rate index (1994 = 100)
FXEX	Expected exchange rate index calculated from Fx88
GCB	Government cash balance (billion baht)
GDPN	Gross domestic product at current market prices (billion baht)
GDPR	Gross domestic product at 1988 constant prices (billion baht)
GDPR_HSM	Gross domestic product trend at 1988 constant prices, estimated from Hodrick-Prescott and exponential smoothing methods (billion baht)
GREV	Government revenue (billion baht)
IPR	Private investment at 1988 constant prices (billion baht)
IPUB	Public investment at 1988 constant prices (billion baht)
$MBROAD^{D}$, $MBROAD^{S}$	Money supply (billion baht)
MGR	Imports of goods at 1988 constant prices (billion baht)
MLR	Minimum lending rate (per cent per annum)
MR	Imports of goods and services at 1988 constant prices (billion baht)
MSR	Imports of services at 1988 constant prices (billion baht)

NEER	Nominal effective exchange rate (1994 = 100)
NFA	Net foreign assets (billion baht)
OTHTIND	Other indirect taxes (billion baht)
PCREDIT	Claims on private sector (including securities holdings by the private sector) (billion baht)
PGCON	Government consumption deflator (1988 = 100)
PGDP	GDP deflator (1988 = 100)
PIFX	Public investment deflator (1988 = 100)
PIP	Private investment deflator (1988 = 100)
PLANDTH	Townhouse (including land) price index (1991 = 100)
PM$	Goods and services import price index (US dollars, 1988 = 100)
PMG$	Goods import price index (US dollars, 1988 = 100)
PMS$	Services import price index (US dollars, 1988 = 100)
PPI	Producer price index (2000 = 100)
PRESSURE	Pressure on exchange rate
PX$	Goods and services export price index (US dollars, 1988 = 100)
PXG$	Goods export price index (US dollar, 1988 = 100)
PXS$	Services export price index (US dollars, 1988 = 100)
RD3M	Three-month deposit rate (per cent per annum)
REER	Real effective exchange rate (1994 = 100)
RESERVE	International reserves (billion US dollars)
RPPI	Retail petroleum price index (1996 = 100)
TAXREV	Tax revenue (billion baht)
TC	Corporate income tax (billion baht)
TD	Direct tax (billion baht)
TEXC	Excise tax (billion baht)
TH	Personal income tax (billion baht)
TIND	Indirect tax (billion baht)
TVAT	Value added tax (billion baht)
WEALTH	Asset value (M2A and securities value) (billion baht)
XGR	Exports of goods at 1988 constant prices (billion baht)
XR	Exports of goods and services at 1988 constant prices (billion baht)
XSR	Exports of services at 1988 constant prices (billion baht)

Independent variables

CPIUS	Consumer price index of the United States (1990 = 100)
CGOVN	Government consumption at current prices (billion baht)
DUBAI	Dubai crude oil price (US dollars/barrel)
FARMPRICE_OTH	Other items of farm price index (1995 = 100)
FEDFUND	Federal funds rate (per cent per annum)
FINB	Government bond issuance for financial sector restructuring (billion baht)
GCAPITAL	Government capital expenditure (billion baht)
GCURRENT	Government current expenditure (billion baht)

IPUBN	Government investment at current prices (billion baht)
MINWAGE	Minimum wage (baht/day)
MUV	Manufacturing unit value index (2000 = 100)
NONBUDGET	Government non-budgetary balance (billion baht)
NPL	Non performing loans (billion baht)
OTHBP	Other items of balance of payments (billion baht)
OTHCAP$	Other items of capital and financial account (billion US dollars)
OTHGDP	Other items of gross domestic product at 1988 constant prices (billion baht)
OTHMBROAD	Other items of MBROAD (billion baht)
OTHNFA	Other items of net foreign assets (billion baht)
OTHREV	Non-tax revenue (billion baht)
PW_NONF	World non-fuel commodity price index (1995 = 100)
POTHGDP	Other items of gross domestic product deflator (1988 = 100)
RC	Corporate income tax rate (per cent)
REGIONFX	Regional exchange rate index (China, Singapore, Indonesia, Korea and the Philippines) (1994 = 100)
REXC	Excise tax rate (per cent)
RH	Personal income tax rate (per cent)
RMGR	Imports of goods to imports of goods and services ratio
RMSR	Imports of services to imports of goods and services ratio
ROTHTIND	Other indirect tax rate (per cent)
RP1D	1-day repurchase rate (per cent per annum)
RVAT	Value added tax rate (per cent)
RXGR	Exports of goods to exports of goods and services ratio
RXSR	Exports of services to exports of goods and services ratio
TPCPI	Trading partners consumer price index (Asian region economies, United States, Japan, euro area economies and United Kingdom) (2002 = 100)
TPGDP	Trading partners gross domestic product index (Asian region economies, United States, Japan, euro area economies and United Kingdom) (2002 = 100)
TPFX	Trading partners exchange rate per US dollar (Asian region economies, United States, Japan, euro area economies and United Kingdom) (1994 = 100)
WEN	Energy weight in CPI basket (proportion)
WFARMPRICE_12	Weight of 12 main products in farm price index basket (proportion)
WFARMPRICE_OTH	Weight of other items in farm price index basket (proportion)
WFP_12	World farm price index (12 main products of Thailand) (1995 = 100)
WRFOOD	Raw food weight in CPI basket (proportion)

Dummy variables

POST2000Q3	represents periods since 2000:Q3 where 2000:Q3 onwards = 1, other = 0
PRE2000Q3	represents period before 2000:Q3 where 2000:Q3 onwards = 0, other = 1
SALARY1	represents periods between 1994:Q4 to 2004:Q1 during the first change in the civil servants' salary structure where the dummy = 1, other = 0
SALARY2	represents periods between 2004:Q2 to 2007:Q3 during the second change in the civil servants' salary structure where the dummy = 1, other = 0

Corporate variables

ASSET	Assets (billion baht)
COGS	Cost of goods sold (billion baht)
DE	Debt to equity ratio (times)
DEBT	Liabilities (billion baht)
DUM01Q4	Represents debt restructuring period, where 2001 Q4 to present = 1, other = 0
EBIT	Profit (Loss) before interest and income tax expenses (billion baht)
EQUITY	Shareholders' equity (billion baht)
EXTRA	Other expenses (billion baht)
ICR	Interest coverage ratio (times)
INT	Interest expenses (billion baht)
NI	Net profit (loss) (billion baht)
OTHER	Other expenses (billion baht)
PPI	Producer price index (2000 = 100)
SALES	Revenue from sale of goods (billion baht)
TAX	Corporate income tax (unit: billion baht)

Household Model

LOANHHT	Banks' lending to households (billion baht)
INTHH	Interest payments (billion baht)
IGEARHH	Ratio of interest payments to income after tax (per cent)