II. International and domestic economic and financial conditions

2.1 International economic and financial conditions

Global economic growth slumped in 2011 as a result of an intensification of the European sovereign debt crisis and fears over fragilities in other regions. The recovery in major advanced economies weakened in response to elevated pressures of sovereign financing, especially in the euro area, which is predicted to go into a mild recession. Growth in emerging and developing economies was moderate and even slower than expected because of the worsening global economy and weakening domestic demand, but activity remained relatively solid in most of these economies. Mainland China's economy grew at a more gradual pace. Measures to stem overheating investment and inflation began to bear fruit, contributing to a reduction in pressure on soaring commodity prices and a deceleration in credit expansion. Nevertheless, credit risks in the shadow banking system kept rising. In the beginning of 2012, world economic growth resumed somewhat thanks to improved activity in the US and an array of measures in the euro area in response to its sovereign debt crisis. From April onwards, however, growth prospects have dimmed given anti-austerity protests spreading across Europe, Greece's political turmoil, worsening non-performing loans in the Spanish banking industry and the deepening European sovereign debt crisis.

The global financial system was swamped in a danger zone of instability owing to the European sovereign debt crisis that emanated from the periphery of the euro area, spread into the core, and further spilled over to the banking sectors of a number of sovereigns. What's more, bank deleveraging resulting in a credit crunch could initiate an adverse feedback loop between the financial sector and real economy. The euro area economies and the IMF have taken various important policy steps, but the crisis has yet relieved despite the fact that some measures have borne fruit for restoring confidence in financial markets. Continuing challenges of sovereign financing facing some economies could threaten global financial stability. Moreover, the impact of the sovereign debt turmoil also spilled over to emerging and developing economies, especially emerging Europe, which was affected most significantly. In other emerging economies, potential vulnerabilities to sudden reversals of capital inflows and deteriorating liquidity would pose upward pressures on financial markets, despite improved shock-bearing capabilities of banking systems.

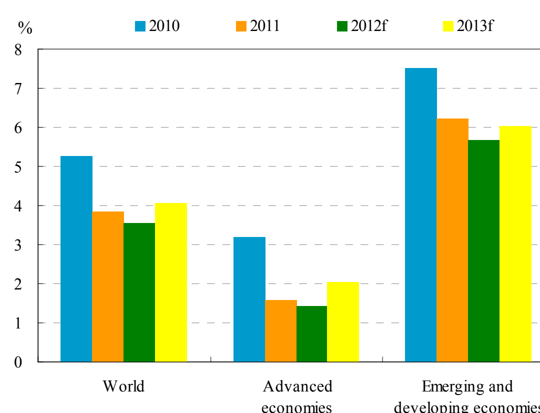
Global downside risks elevated, but inflationary pressures waned

Global growth was moving on a decelerating path, and fragilities remained

The global economy grew at a tepid pace in the first half of 2011. However, from the second half of the year onwards, growth momentum dampened and downside risks increased due to intensifying strains in the European sovereign debt crisis and economic fragilities elsewhere. The IMF estimated that the global economic growth rate substantially dropped to 3.9% through 2011 from 5.3% a year earlier. This number could further decrease to 3.5%, driven largely by an upsurge in sovereign debt yields, the impact of bank deleveraging on output and additional fiscal consolidation. Improving financial conditions and less fiscal tightening might fuel the growth rate to rebound to 4.1% in 2013[13] (Chart 2.1). Other major international institutions announced more pessimistic outlooks for the global economy. For example, Global Insight predicted world real GDP growth to pick up to 3.5% in 2013 from 2.9% in 2012,[14] while the United Nations forecast that the growth of world gross product (WGP) would reach 2.6% in its baseline outlook for 2012 and 3.2% for 2013.[15]

From 2011 onwards, quarterly economic growth in most advanced economies moved at a moderate pace resulting from lackluster economic activity and the spillover effects of the European sovereign debt crisis. However, rebounding private consumption and strong fixed investment boosted a stronger-than-expected growth in US output. The IMF estimated real GDP in advanced economies would drop to 1.6% in 2011 from 3.2% a year earlier, well below the growth rate of 6.2% in emerging and developing economies. It is expected to rebound to 2.0% in 2013 following growth of 1.4% in 2012 (Chart 2.1). On the back of the effects of bank deleveraging on the real economy and the impact of additional fiscal consolidations, the euro area economy is predicted to go into a mild recession in 2012. Meanwhile, output growth in the US is likely to stay moderate, bolstered by recovering domestic demand and an improving labor market.

Chart 2.1 Global economic growth rates



Note: Figures for 2012 and 2013 are IMF estimates.
Source: IMF (2012), *World Economic Outlook*, April.

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[13] Except as otherwise noted, all IMF estimates and forecast data and information related to economic growth rates and CPI annual growth cited in this chapter relate to the April 2012 WEO.

[14] Global Insight (2012), *Global Executive Summary*, May.

[15] UNCTAD (2012), *World Economic Situation and Prospects 2012*, January.

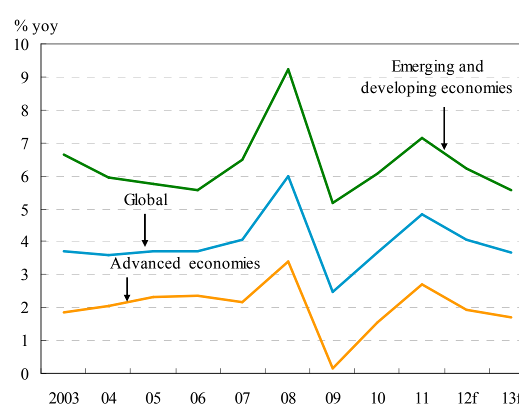
GDP growth in emerging and developing economies experienced a greater-than-expected slowdown in 2011. The IMF estimated that output grew by 6.2% throughout the year from 7.5% in 2010, but Asia, registering an economic growth rate of 7.8%, outpaced elsewhere. Growth in Mainland China contracted to 9.2% as a result of weakening export momentum and domestic demand. Output in emerging and developing economies is projected to register a sustained fall to 5.7% in 2012, but rebound to 6.0% in 2013 (Chart 2.1).

Inflationary pressures receded

Global consumer prices saw an upward trend in the first half of 2011, especially in emerging and developing economies. In the second half of 2011, however, with softening global demand, consumer prices saw a favorable or falling trend by way of gradually stabilizing international raw materials prices. Reflecting this, inflationary pressures abated. The IMF estimated that global headline inflation (consumer price inflation) settled at 4.84% in 2011, above the 3.68% recorded a year earlier. In 2012, global oil prices are projected to remain elevated due to geopolitical tensions, but non-oil commodity prices could drop below the level registered one year earlier. Against this backdrop, global headline inflation is expected to fall back to 4.04% (Chart 2.2).

In advanced economies, inflationary pressures stayed subdued as a result of economic slump and well-anchored inflation expectations. Reflecting this, the IMF projected that headline inflation would drop to 1.9% in 2012, down from a peak of 2.7% in 2011. The US and the euro area would exhibit waning inflationary pressures, while concern about deflation is expected to linger in Japan. Inflationary pressures in emerging and developing economies are predicted to subside, with headline inflation standing at 6.2% during 2012, down from 7.1% in 2011(Chart 2.2), as a consequence of decelerating economic growth and decreasing food prices. Inflationary pressures in emerging Asian economies are broadly expected to ease, except for India and Indonesia.

Chart 2.2 Global headline inflation indices



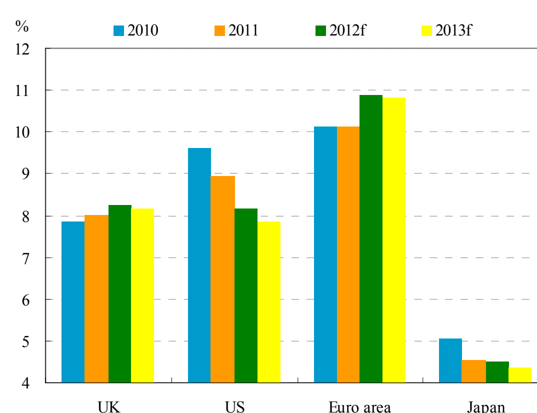
Note: Figures for 2012 and 2013 are IMF estimates.
Source: IMF (2012), *World Economic Outlook*, April.

Unemployment rates in advanced economies showed slight improvements but performance was uneven

The IMF estimated the unemployment rate in advance economies had slipped to 7.94% in 2011 from 8.28% in 2010. Unemployment is expected to see an ongoing improvement in the US and Japan in 2012, whereas it may keep exacerbating in the UK and the euro area over the same period (Chart 2.3). In the US, the tenuous labor market improved gradually, helping the unemployment rate to fall to a three-year low of 8.2% in March 2012.[16] The unemployment rate in the UK stayed at a high level of 8% through 2011 and further surged in the forth quarter of the year, attributable to stagnant economic activity. The rate further rose to 8.2% in March 2012, with 1.02 million unemployed youth.[17] In Japan, the unemployment rate shrank to 4.2% in September 2011, backstopped by earthquake reconstruction, but bounced back to 4.5% in Mach 2012.[18]

In the euro area, unemployment kept advancing on the back of the worsening European sovereign debt crisis, moderating economic growth and increasing corporate layoffs (Chart 2.3). The EA-17 seasonally adjusted unemployment rate rose to 10.8% in February 2012, hitting a peak since the implementation of the euro system. However, there were sharp differences among the member states. The lowest unemployment rates were recorded in Austria (4.2%) and the Netherlands (4.9%), while the highest rates were registered in Spain (23.6%) and Greece (21.8%).[19] In particular, unemployment rates of persons aged below 25 were even greater than 50% in the latter two countries. The high level of unemployment rates in the euro area, especially high youth unemployment, has raised tough issues that need to be urgently addressed by national governments.

Chart 2.3 Unemployment rates in major economies



Note: Figures for 2012 and 2013 are IMF estimates.
Source: IMF (2012), *World Economic Outlook*, April.

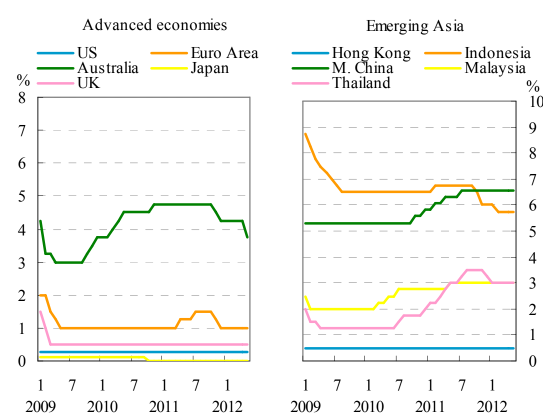
[16] The figure is based on a US Bureau of Labor Statistics (BLS) news release on 6 April 2012.
[17] The figures are based on labor market statistics for January to March 2012, released in the Statistical Bulletin of the UK Office for National Statistics on 16 May 2012.
[18] The figure is based on a news release on 27 Aril 2012 by the Japan Statistics Bureau, Director-General for Policy Planning (Statistical Standards) & Statistical Research and Training Institute.
[19] The unemployment rates for Austria, the Netherlands and Spain are as of February 2012, based on a Eurostat news release on 2 April 2012. The figure for Greece is as of January 2012, released in a Hellenic Statistical Authority news release on 12 April of the same year.

Monetary policy kept easing in advanced economies along with an improvement in fiscal deficits

Most advanced economies continued to adopt easy monetary policies in 2011 in an effort to boost domestic recovery. The Board of Governors of the Federal Reserve System (FED), the Bank of England (BoE) and the Bank of Japan (BOJ) kept their low policy rates unchanged.[20] By contrast, the European Central Bank (ECB) lowered the policy rate in November and December of the same year to provide liquidity support to banks. Meanwhile, the Reserve Bank of Australia also successively cut the cash rate target three times to 3.75% from November 2011 to May 2012[21] (Chart 2.4). Furthermore, the FED, ECB, BOJ, BoE, Bank of Canada and Swiss National Bank jointly reduced the dollar overnight index swap rate to plus 0.5% from plus 1% in the hope of relieving the dollar liquidity shortage in EU-based banks. The move was aimed at easing the liquidity constraints in financial markets and boosting economic activity by promoting access to bank credit for the corporate and household sectors.

The monetary policy stances in emerging Asian economies were varied due to cross-country divergence in economic and financial conditions. Mainland China sequentially hiked policy rates three times in the context of continued policy tightening to restrain housing and consumer prices in the first three quarters of 2011. However, monetary policy turned to an easy stance from the fourth quarter of the year in view of tightening market liquidity and increasing failures of small and medium enterprises due to funding strains. As of the middle of May 2012, the financial institution deposit reserve ratio had been reduced three times in response to slowing economic growth on the horizon. The Bank Indonesia lowered the policy rate

Chart 2.4 Policy rates in selected economies



Notes: 1. Advanced economies: figure for the US is based on federal funds rate target; for Australia, cash rate target; for the UK, official bank rate; for the euro area, the main refinancing operations fixed rate; and for Japan, uncollateralized overnight call rate.
2. Emerging Asia: figure for Hong Kong is based on discount window base rate; for Mainland China, financial institution one-year lending base rate; for Thailand, 1-day repurchase rate; for Indonesia, Bank Indonesia rate; for Malaysia, overnight policy rate.
3. Figures are 3 May 2012 data.

Source: Central banks' websites.

[20] The Federal Open Market Committee (FOMC) decided to maintain the target range for the federal funds rate at 0 to 0.25% on 25 April 2012 and to maintain this exceptionally low level for the federal funds rate at least through to late 2014. Moreover, as of 3 May 2012, the BoE preserved its policy rate at 0.5%, while the BOJ kept the uncollateralized overnight call rate at around 0 to 0.1%.

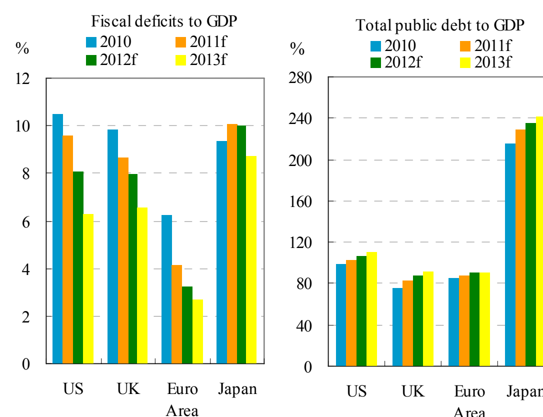
[21] The ECB cut the main refinancing operations fixed rate by 25 basis points to 1.25% in November 2011 and continued cutting the rate to 1.0% in the following month. The Reserve Bank of Australia cut the cash rate target twice, each time by 25 basis points, in November and December 2011, and further cut the rate by 50 basis points to 3.75% on 1 May 2012.

three times to 5.75%[22] from October 2011 to February 2012 in response to the deceleration in global activity. In Thailand, the policy rate stayed on its upward trend in the first half of 2011. Subsequently, floods seriously impacted the Thai economy in the second half of the year, resulting in the rate dropping to 3.0% after consecutive rate cuts in December 2011 and January 2012, respectively. The Bank Negara Malaysia policy rate remained unchanged following a rate rise of 25 basis points in May 2011 (Chart 2.4).

In 2011, the fiscal deficits in most advanced economies improved notably but government debt kept expanding (Chart 2.5). As a result, fiscal risks in advanced economies remained high. In the US and the UK, the fiscal deficit to GDP shrank year on year but total government debt to GDP continued mounting. Spurred by growing earthquake reconstruction spending, Japan saw continued hikes in the fiscal deficit and total government debt, with a government debt-to-GDP ratio of 229.8% in 2011. Meanwhile, in the euro area, the fiscal deficit as a whole shifted to register a sharp plunge, mainly by virtue of a marked improvement in the fiscal position of Germany. Spain also exhibited a highly strengthened fiscal position. For France and Italy, the improvement was limited as new fiscal measures did not completely come into effect until 2012. Greece saw a higher-than-expected fiscal deficit due to poor economic performance.

In 2012, with additional large-scale fiscal consolidations, the reductions in the fiscal deficits of most advanced economies are expected to be sustained. The IMF forecast that the fiscal deficit-to-GDP ratio might fall to 5.7% for the year 2012 from 6.6% in 2011, and further drop to 4.5% in 2013. By contrast, the government debt-to-GDP ratio might keep rising to 106.5% in 2012 from 103.5% a year earlier, and even climb to 108.6% in 2013.[23] The euro area is on the brink of a mild recession in view of softening growth in advanced economies. In this context, large-scale fiscal retrenchment could induce adverse impacts on the economic prospects of this region alongside intensifying pressures on financial markets.

Chart 2.5 Fiscal deficit and public debt in major advanced economies



Source: IMF (2012), *Fiscal Monitor*, April.

[22] In Mainland China, the financial institution one-year lending base rate was cut to 6.06%, 6.31% and 6.56% in February, April and July 2011, respectively. In Indonesia, the BI rate was reduced by 25 basis points to 5.75% in February 2012, following sequential rate cuts that registered the policy rate at 6.5% (October 2011) and 6.0% (November 2011).

[23] IMF (2012), *Fiscal Monitor*, April.

In fact, economists often hold different perspectives with respect to the effect of "fiscal austerity" on the economy. Some argue that the European sovereign debt crisis reflects a "confidence crisis" stemming from investors' distrust of European Union (EU) policymakers. Theoretically, it is plausible that the strong enforcement of fiscal austerity could bring benefits to maintain the EU's fiscal discipline in the face of a protracted downturn. However, the consequences in the real world may breach the underlying theory. This is because fiscal austerity could lead to unfavorable results, including further sluggishness in output, soaring unemployment rates, sharply shrinking taxation, deteriorating fiscal positions, and ultimately increasing difficulty in restoring investor confidence. From 2012 onwards, the convergence of arguments about anti-austerity has gradually gone mainstream driven by still-lingering concerns about the effectiveness of fiscal contractions to relieve the European sovereign debt crisis, and the initiative of economists who advocate replacing the austerity of contracting fiscal spending with structural reforms for boosting economic growth. Given the faltering economy still facing Europe, the emphasis should now shift increasingly to prioritizing measures that can boost growth and tackle high unemployment. In this context, Europe ought to head toward a more stable fiscal stance so as to promote healthy domestic and global economic conditions, and to resume an orderly financial system.

Future economic risks

According to the latest analysis from the IMF and other international institutions,[24] uncertainties continued to cloud the world economic outlook with heightened downside risks, including (1) a more massive and persistent bank deleveraging and credit tightening in the euro area as a result of an intensification of the vicious circle of sovereign debt and banks' funding stress; (2) still-fragile financial systems and slack macro demand; (3) an elevating unemployment rate in advanced economies; (4) the absence of progress in the medium-term fiscal adjustment plans by the US and Japan. In particular, the short term political stalemate in the US could inflame the risk of fiscal contraction; (5) downside risks of advanced economies could threaten economic growth and stability in emerging and developing economies through international trade and financial channels; (6) geopolitical unrest could trigger an abrupt increase in oil prices; (7) global risk aversion could cause a rise in funding costs; and (8) easy monetary policies in advanced economies could induce asset price bubbles, currency appreciation and mounting inflation in some emerging and developing economies. Considering these uncertainties, the IMF and other international organizations suggest that

[24] IMF (2012), *World Economic Outlook*, April; OECD (2011), *Economic Outlook*, No. 90, November; OECD (2012), *What is the economic outlook for OECD countries? An interim assessment*, March; UNCTAD (2012), *World Economic Situation and Prospects 2012*, January; Global Insight (2012), *Global Executive Summary*, January.

national governments should adopt appropriate policies or measures in response to the rising macroeconomic risks.

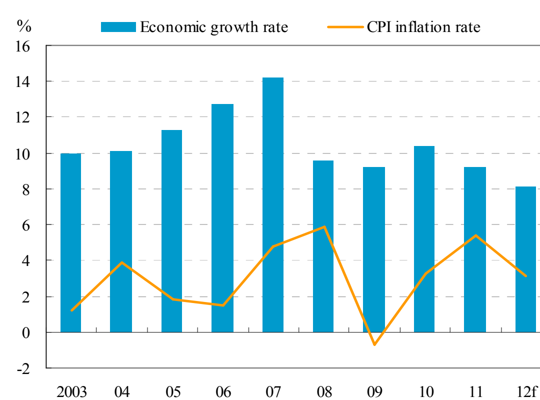
Mainland China's economic growth and credit expansion slowed down

Mainland China's economic growth slowed down and pressure on consumer prices alleviated

In 2011, due to global economic growth slowing down, Mainland China's trade surplus shrank. With Mainland China's "Twelfth Five-Year Plan for National Economic and Social Development" proposing to reorient its growth policies and promote consumption over investment and exports, momentum in fixed capital formation began to decline. However, boosting private consumption in a short time is proving to be much more difficult. As such, instead of increasing, real consumption decreased slightly compared to the previous year. Economic growth, therefore, decreased quarter by quarter from 9.7% in Q1 to 8.9% in Q4 and registered 9.2% for the whole of 2011, down from 10.4% in 2010. In 2012, Mainland China's export performance continues to be clouded by the pessimistic shadows of weak economic conditions in Europe and the US and transformation of its growth policies is expected to suppress investment growth. As a result, Global Insight projected Mainland China's economic growth through 2012 to soften to a rate of 8.1%[25] (Chart 2.6).

Regarding consumer prices, due to increasing food prices driven by rapidly rising wages and international raw materials costs, the CPI inflation rate in the first half of 2011 continued its upward trend from 2010 and climbed from 4.9% in January to 6.5% in July 2011, registering a new high in the past three years. In the second half of the year, as Mainland Chinese officials aggressively implemented measures to stabilize the supply of agricultural products, accompanied by decreasing prices of international raw materials, the increase of food prices slowed and allowed the CPI inflation rate to fall back to 4.1% in December. Nevertheless, the CPI

Chart 2.6 Economic growth rate and CPI inflation rate of Mainland China



Note: Figures for 2012 are Global Insight projections.
Sources: National Bureau of Statistics of China and Global Insight.

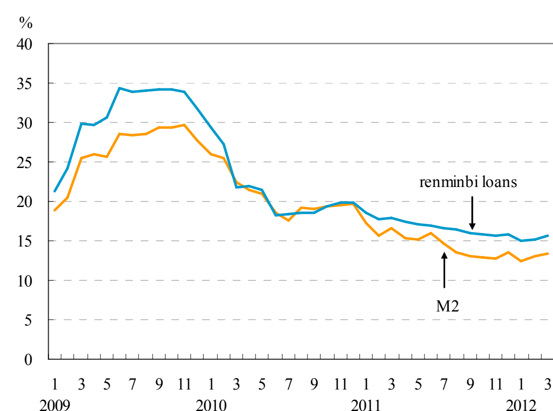
[25] Global Insight estimate in May 2012.

inflation rate for the whole of 2011 still increased by 2.1 percentage points to 5.4% compared to that in 2010. In 2012, the inflationary pressure of a shortage in the supply of agricultural products is expected to ease and over capacity of production in other areas of the economy will continue to stabilize non-food prices. Global Insight projected Mainland China's inflation rate to decrease to 3.1%, indicating an alleviation of inflationary pressure (Chart 2.6).

Bank credit expansion slowed down and monetary policy eased

Overspeed credit expansion in 2009 built up asset bubbles and inflationary pressure in Mainland China. In response to this issue, Mainland China shifted toward a tightening monetary policy stance and adopted measures to curb an overheating real-estate sector and local government financing platforms from 2010 onwards. In the first three quarters of 2011, the PBC continuously tightened the money supply and aggressively drained liquidity from the market by raising the reserve requirement ratio for depository financial institutions six times by a total of three percentage points, raising 1-year renminbi benchmark deposit and lending rates of financial institutions three times to 3.5% and 6.56%, respectively, and conducting open market operations several times. Starting Q4, as tightened monetary policy soaked up market liquidity, masses of small and medium enterprises facing funding cuts went bankrupt. Bearing this situation in mind, alongside declining inflationary pressure resulting from slowing economic growth on the horizon, the PBC reversed its tightened monetary policy stance by lowering the RRR for depository financial institutions three times by a total of 1.5 percentage points during December 2011 to mid-May 2012. Therefore, as of the end of March 2012, the annual growth rates of M2 and renminbi loans decreased from their peaks of 29.7% and 34.4% in 2009 to 13.4% and 15.7% (Chart 2.7). The real estate climate index also descended from its peak of 105.89 in 2010 to 96.92 (Chart 2.8). Both indicated that credit expansion had slowed and the property market had cooled down. However, the rapid adjustment of housing prices may weigh on the real estate industry and the loan quality of banks, and thus warrant close attention.

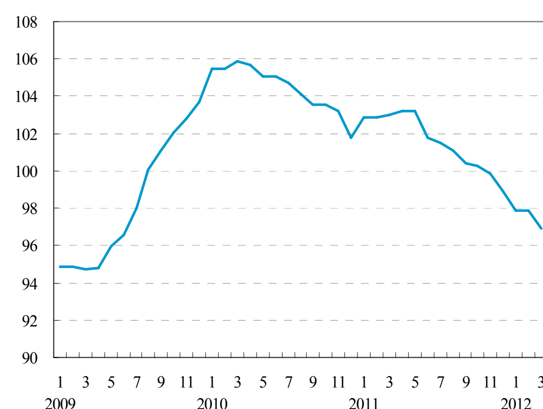
Chart 2.7 Annual growth rates of M2 and renminbi loans in Mainland China



Source: PBC.

Meanwhile, Mainland China imposed interest rate controls and credit rationing which resulted in an imbalance between funding supply and demand. Its credit markets are subject to market access constraints and oligopolized by state-owned banks, also posing challenges to private companies in receiving funding. As a result, the financial intermediation function of the banking system was insufficient, which gave rise to various types of shadow banking[26]. Additionally, starting 2010, Mainland China adopted tightened monetary policy and property market cooling measures, forcing many companies to resort to informal banking channels to meet funding needs, which further led to the quick expansion of the shadow banking system. As a result, the financing scale of the entire economy increased rapidly. While Mainland China's economic growth slowed and its property market cooled down, the credit risk of the shadow banking industry continuously increased. This may negatively impact the asset quality of banks through contagion effects and aggravate economic downside risks, and thus close monitoring of future developments and potential impacts is needed.

Chart 2.8 Real estate climate index of Mainland China



Note: The real estate climate index is a composite of the indexes for real estate investment, source of capital, area of land developed, floor space of buildings under construction, floor space of marketable yet unsold buildings and average sales price of buildings.
Source: National Bureau of Statistics of China.

The global financial system remained fragile

With aggravating European sovereign debt strains in the second half of 2011, the sovereign funding stress spilled over from the periphery of the euro area into the core, and in turn spread to the banking sectors of sovereign countries. This pushed the global financial system to enter into a danger zone with sharply rising risks. International institutions and euro area economies have successively taken rounds of policy steps aimed at taming the deteriorating euro area debt crisis and banking sector problems. Although they have recently been somewhat effective for restoring confidence in financial markets, some economies still face substantial challenges in sovereign financing that might persistently threaten global financial stability. Furthermore, the US and Japan have not yet achieved political consensus for medium term deficit reductions, renewing latent risks to financial stability. In response to

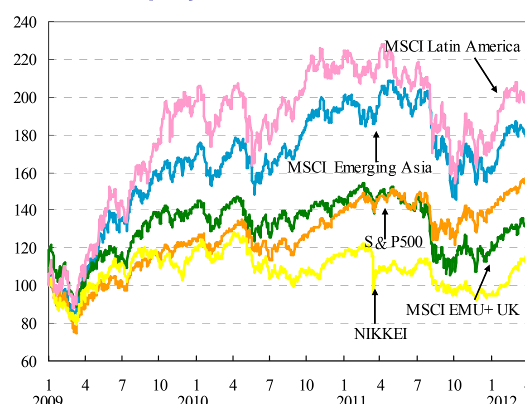
[26] Shadow banking in Mainland China includes: (1) non-bank institutions, such as pawnshops, credit guarantee companies and micro-finance companies; (2) private equity; (3) wealth management products, such as entrusted loans and trust loans; (4) financial innovation products, such as asset securitization and derivatives. This definition draws from IMF (2011), People's Republic of China: Financial System Stability Assessment, Country Report No. 11/321, November, and other relevant papers.

mounting risks to stability, the IMF suggested that stepping up cross-border coordination among governments and taking necessary policy responses to entrench financial stability is warranted.

Deterioration in some advanced economies' sovereign debt problems spilled over to the euro area banking system

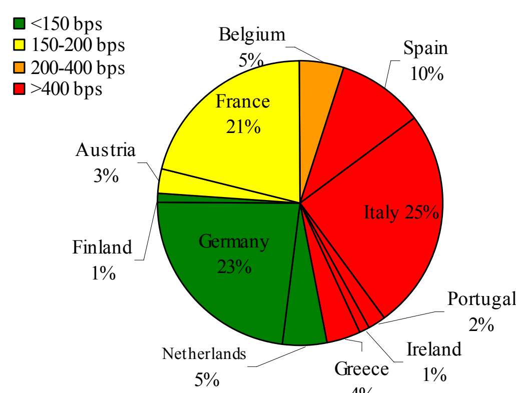
In the first half of 2011, sovereign debt strains in some advanced economies were not completely resolved. Nevertheless, the risks to global stability gradually fell, backstopped by improving growth prospects along with benign liquidity conditions and macroeconomic policies taken by national governments. However, concerns about sovereign debt sustainability renewed with recovery proceeding at a slow pace from the second half of the year. This, together with the fact that euro area member countries were still struggling to forge a political consensus for financial adjustments and fiscal bailouts, contributed to an upswing in sovereign default risks and more sovereign rating downgrades. This was signified by an acute increase in sovereign CDS spreads of periphery countries over core countries. A further loss of investor confidence not only triggered the slump in global stock markets (chart 2.9) but pushed sovereign strains to spill over to core advanced economies of the euro area. As a result, the sovereign CDS spreads of France, Austria and Germany also hit historical highs over this period. In April 2012, the sovereign debt of France and Austria had CDS spreads of over 150 basis points, whereas Belgium registered 250 basis points or so. Some economies—including

Chart 2.9 Performance of key international equity indices



Note: 1 January 2009 = 100.
Source: Bloomberg.

Chart 2.10 Credit default swap spreads of euro area government debt



Notes: 1. The ratios refer to the weight of individual country's government debt to total euro area government debt.
2. Spreads as of April 2012.
3. As of 2011 Q2, the total euro area government debt stood at €6.9 trillion.
Sources: Bloomberg; IMF (2012), *Global Financial Stability Report*, April.

Greece, Ireland, Italy, Portugal and Spain (GIIPS)—even stood beyond 400 basis points. According to IMF estimates,[27] the total GIIPS government debt accounted for 42% of total euro area government debt (Chart 2.10).

Soaring periphery sovereign default risks spilled into the euro area banking system and real economy. The European core economies (such as France, Germany and the UK) that held massive periphery sovereign debt suffered sizable losses due to a plunge in bond prices. As a result, an increasing number of banks in the region suffered credit downgrades as their health weakened. Some banks closed funding channels due to elevated counterparty risks. Accordingly, European banks took severe liquidity risks stemming from funding strains and saw a sharp increase in the cost of funding which even exceeded that during the Lehman crisis. Funding strains among banks also spilled over into the real economy with tighter conditions for accessing bank credit for small and medium enterprises, and individuals. Moreover, some EU-based banks were being forced to launch significant balance sheet deleveraging plans, in part because of increasing sovereign risks, lackluster economic growth in the euro area, increasing difficulty in rolling over funding and higher capital buffer requirements. Against this backdrop, an IMF report suggested[28] that the large EU-based banks could reduce their assets by US$2.6 trillion from September 2011 to the end of 2013, or equivalent to a 7% fall in total balance sheet size, given that the euro area governments have not yet taken further policy responses. About one-quarter of the fall in assets is estimated to occur through a contraction in loans, with the remainder coming largely from sales of securities and non-core assets. This could reignite the vicious feedback loop between the banking system and real economy.

With a view to stabilizing financial markets and restoring investor confidence, the EU, ECB and IMF sequentially launched a series of policy steps, including offering liquidity support, requiring bailout recipients to cut down fiscal deficits, reaching a new fiscal treaty among EU member states and requiring EU-based major banks to enhance their capital. These measures have had effects, to some extent, in stabilizing financial markets and containing the deterioration in the crisis. However, financial stability risks remained elevated as sovereign debt sustainability in some economies stayed at challenging levels and the effectiveness of backstops, such as long-term refinancing operations and the European Financial Stability Fund, are likely to be limited.[29]

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[27] IMF (2012), *Global Financial Stability Report*, April.

[28] See Note 27.

[29] IMF (2012), *Global Financial Stability Report Market Update*, January. The report indicated that long-term refinancing operations did much to alleviate bank-funding concerns, but it has had less of an impact on peripheral sovereign yields. The capacity of the European Financial Stability Fund remains limited. Taking into account resources already committed to program financing, the remainder which is available to be deployed would still likely not be sufficient to contain rising sovereign spreads under stress scenarios.

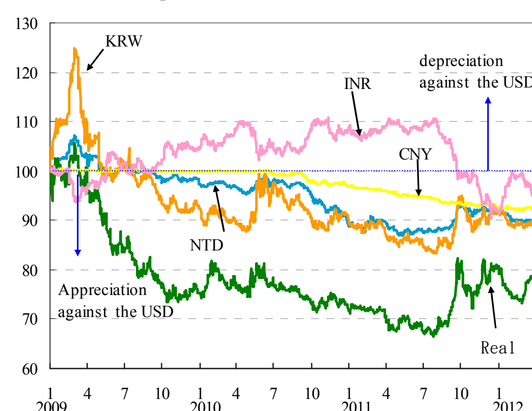
Recently, the US banking sector's health has resumed, but the US financial system remains susceptible to shocks from the European sovereign debt crisis. This is broadly because there are close financial and trade ties between the US and the euro area, the US banking sector holds bulky exposures to EU-based banks, and European banks deleveraged by selling US assets. Indeed, the commercial mortgage-backed securities (CMBS) and asset-backed securities (ABS) markets in the US have recently been under pressure, weighed down by the volume of asset shedding from European banks. Soaring dollar-funding strains in the euro area could also transmit pressure to the US banking sector. While US sovereign debt markets benefited from a flight to safety away from the euro area, such a situation could not be counted on to persist indefinitely. Moreover, against the background of a still-moribund real estate market, US banks will struggle to maintain historical returns on equity in a more stringent regulatory environment. The political impasse over the fiscal consolidation facing the US could also provoke run-ups in sovereign risks. These vulnerabilities in the financial system could renew financial stability risks in the US.

European sovereign debt crisis also spilled over to emerging markets

In the first half of 2011, stronger economic growth in emerging economies, coupled with higher interest rates than in advanced economies, spurred massive capital flows into such economies, and in turn contributed to buoyant stock markets with rising equity prices, exerting upward pressure on currency appreciation in some economies, such as Taiwan, South Korea, Mainland China and Brazil (Chart 2.11). This also brought about some emerging issues, such as a surge in domestic liquidity and credit supply as well as acceleration in leverage levels and asset prices, and ultimately fueled the buildup of risks for overheating and financial imbalances.

In the second half of the year 2011, the deteriorating European sovereign debt crisis spilled over to the European banking system. It not only directly made a serious threat to emerging Europe but spread to other emerging markets. Because European banks had tremendous business lines reaching into emerging Europe, European bank deleveraging curbed capital inflows to those economies, sparking off serious damage to credit supply and economic activity in the

Chart 2.11 Movements of various currencies against the US dollar



Note: 1 January 2009 = 100.
Source: Bloomberg.

region. In addition, the potential spillovers indirectly affected financial systems elsewhere through a contraction of credit and capital outflows. European banks further made a pullback of cross-border lending, especially trade financing. This, combined with a loss of parent bank support for local lending, created unfavorable conditions for accessing bank credit in emerging economies. Meanwhile, capital outflows and deteriorating liquidity also exerted pressures on their foreign exchange, bond and stock markets. For example, in the second half of 2011, many emerging economies suffered slumps in stock markets and dramatic volatilities in foreign exchange markets in the wake of massive capital outflows (Chart 2.9 and 2.11). However, the markets resumed stable trading conditions in the beginning of 2012.

By and large, most emerging economies were resilient to withstand the financial impact and economic spillovers from advanced economies. Nevertheless, given worsening financial and economic conditions, a sharp contraction in domestic and cross-border credit, or large and sudden capital outflows, for example, could pose significant challenges to the resilience of some emerging economies, in particular those in emerging Europe.

Progress in international financial reforms

In December 2010, the Basel Committee on Banking Supervision (BCBS) announced a comprehensive framework presenting reforms on bank capital adequacy and liquidity (also known as Basel III), in an attempt to enhance the resilience of the global banking system, to maintain market confidence in regulatory capital ratios and to provide a level playing field. The implementation will be subject to transitional and phase-in arrangements from 1 January 2013, and be completed by 1 January 2019. In order to adopt Basel III starting in 2013, each Committee member speeded up revamping its domestic regulations related to capital adequacy. However, according to a new survey by the BCBS,[30] among the 27 members, only Japan and Saudi Arabia had completed the final rules as of end-March 2012. The rest of the countries or jurisdictions have either been drafting the regulations or releasing the drafts for comments. This reflects the high degree of sophistication in the revision of the relative rules. In Taiwan, the financial authorities are inclined to follow the supervisory approaches set out by international financial regulatory institutions. To this end, the Financial Supervisory Commission (FSC) has been undertaking the regulations revision taking into account the Basel III. The interim drafts were published in June 2012, while the final rule will be released after a quantitative impact study in the second half of the year, prior to implementation starting in January 2013.[31]

[30] Basel Committee on Banking Supervision (2012), *Progress Report on Basel III Implementation*, April.
[31] For more details, please refer to the text of "The evolution of the implementation of Basel III in Taiwan" in the fourth section titled "Financial infrastructure" of this report.

Moreover, the Financial Stability Board (FSB) provided a policy framework to address the systemic and moral hazard risks associated with global systemically important financial institutions (G-SIFIs), aiming to reduce the probability and severity of the failure of large financial institutions, and prevent a systemic crisis. The policies include (1) the establishment of effective resolution regimes for failing financial firms; (2) requirements for recovery and resolution planning for G-SIFIs; (3) requirements for a 1%-2.5% capital surcharge for G-SIFIs; and (4) more intensive and effective supervision of all G-SIFIs. This framework was endorsed at the 2010 G20 Seoul summit, and the implementation of these measures will begin from 2012. Full implementation is targeted for 2019.

Furthermore, in response to the global financial crisis, US and European financial supervisors successively required domestic banks to conduct stress tests and publish the test results in order to assuage market fears about the soundness of financial institutions in some jurisdictions or countries, and to rebuild market confidence. In light of these recent developments, the stress tests have drawn more attention. In addition, according to their responsibility of safeguarding financial stability, central banks have recently become devoted to developing adequate stress testing frameworks that are able to assess the vulnerabilities and the risk-bearing capability of a financial system. In this context, macro stress tests are regarded as one of the most crucial assessment tools. In Taiwan, in line with international regulatory trends, the FSC requires domestic banks to conduct a stress test at least annually under pillar 2 of Basel II, and to submit the test results to the FSC to serve as a reference for financial supervision. Meanwhile, in accordance with the operational objective that aims at promoting financial stability, the CBC recently developed two macro stress testing models that focus on market and credit risks, respectively, with intent to assess system-wide financial soundness and shock-bearing capability under alternative economic scenarios (Box 1).

2.2 Domestic economic and financial conditions

Taiwan's economy grew at a decelerated pace in 2011 compared to the previous year due to a higher base effect. During the same period, the price level rose moderately. Short-term external debt servicing ability remained strong on the back of a continued surplus in the current account and ample foreign exchange reserves. The scale of external debt continued to expand, while overall external debt servicing ability stayed robust. The government's fiscal deficit shrank, whereas total government debt continuously mounted.

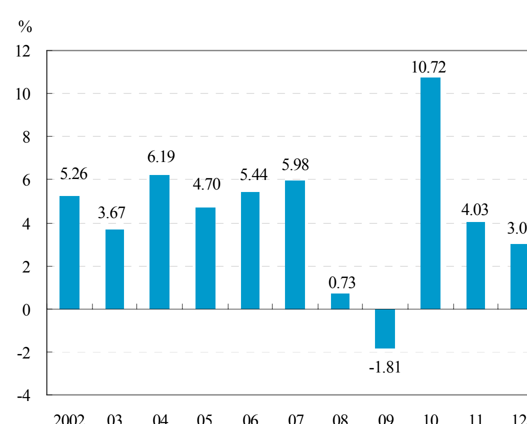
Domestic economic expansion decelerated

In the first half of 2011, as exports expanded steadily on account of stably growing foreign demand from emerging economies and upward momentum in private investment, coupled with mild growth in private consumption as a result of improving employment, rising salaries and buoyant financial markets, the economic growth rate registered 6.62% in Q1 and slightly declined to 4.52% in Q2. As for the second half of the year, the recovery momentum of the global economy became sluggish, resulting in continuously shrinking exports. Moreover, dull stock market performance and shrinking financial wealth also partially weakened the sustainability of private consumption. Meanwhile, private investment saw a slowdown due to moderating external demand. As a result of these unfavorable economic conditions, combined with a higher base in the previous year, the economic growth rates of Q3 and Q4 declined to 3.45% and 1.85%, respectively. The DGBAS statistics stated that the annual economic growth rate dropped to 4.03% in 2011, exhibiting a significant decrease from 10.72% a year earlier (Chart 2.12).

In order to alleviate the adverse impact from sluggish Western economies, the Executive Yuan proposed an “Economic Climate Response Program” in November 2011. Under this Program, short-term countercyclical measures came into effect. Moreover, the Executive Yuan further established the “Global Economic Climate Response Group” with the purpose of improving the ability to respond to global economic fluctuations and developing strategies to reshape Taiwan’s economic structure.

In 2012 Q1, as a consequence of dwindling exports and contracting private investment, preliminary statistics from the DGBAS indicated that the economic growth rate was merely 0.39%. Looking ahead, an improving global economy and recovery of the semiconductor industry are expected to be beneficial to a rebound in exports and more industrial investment. However, rising crude oil and electricity prices may lift the overall price level up and may partially offset economic growth by way of a restraint on private consumption. Thus, the DGBAS

Chart 2.12 Economic growth rates in Taiwan



Note: Figure for 2012 is forecast by DGBAS.
Source: DGBAS.

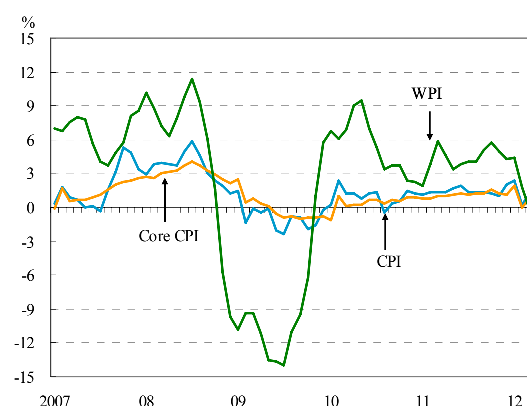
forecast Taiwan's economic growth rate would decline to 3.03%[32] in 2012 (Chart 2.12). Moreover, although the European sovereign debt crisis was temporarily relieved after a second bailout was offered to Greece,[33] US and European peripheral countries' sovereign debt strains have not been properly solved. Other negative factors, including the unstable situation in the Middle East which could lead to global oil price spikes, Mainland China's economy possibly experiencing a hard landing, and the potential recession of the euro area, raise uncertainties concerning the vitality of the global economic recovery, and the ongoing impact on Taiwan's economy is worth close attention.

Domestic prices rose modestly, while inflationary pressures gradually mounted

With still-elevated international prices of raw materials, the WPI inflation rate trended up through 2011 Q1 and hit a peak of 5.82% in March. Afterwards, the easing of the international prices of raw materials and appreciation of the NT dollar exchange rate against the US dollar together brought the WPI inflation rate down significantly (Chart 2.13). As a result, the annual WPI inflation rate registered 4.32% in 2011, lower than the 5.46% recorded a year earlier.

Driven by climbing retail prices of gasoline and some consumer goods such as food, the CPI inflation rate gradually moved up in the first half of 2011. While international prices of raw materials declined and the price of fruits and vegetables remained stable owing to good weather, headline (CPI) inflation in the second half of 2011 was relatively mild. Although higher than the 0.96% and 0.44% logged a year earlier, the average CPI and core CPI inflation rates of 2011 were 1.42% and 1.13%, respectively. For 2012, the average WPI inflation rate from January to April continuously dropped to 1.31%, and the average CPI and core CPI inflation rates declined to 1.32% and 0.87%,[34] respectively, over the same period, revealing that price increases turned moderate in the earlier part of 2012 (Chart 2.13).

Chart 2.13 Consumer and wholesale price inflation rates



Note: Figures are measured on a year-on-year change basis.
Source: DGBAS.

[32] The figures are based on a DGBAS press release on 25 May 2012.
[33] In March 2012, private bondholders agreed to a restructuring deal with Greece's government, resulting in a €107 billion write-off of Greek debt and a second €130 billion bailout from the European Union.
[34] The figures are based on a DGBAS press release on 7 May 2012.

With regard to 2012 Q1, as the global supply risk of crude oil further ascended in line with the instability in both North Africa and the Middle East, inflationary pressures relating to energy-related products ratcheted up. Furthermore, Taiwan's government announced a "Gasoline And Electricity Price Rationalization Policy" in April 2012 in order to cope with soaring global oil prices and years of low domestic electricity rates. It was proclaimed that electricity rates would be adjusted in three stages starting in June, which might lead to volatility in the consumer price level. However, inflationary pressures are expected to ease due to the following influences: declining global demand has lowered the prices of agricultural and industrial raw materials; domestic housing rents have remained stable; and an Executive Yuan panel charged with monitoring and stabilizing retail prices has urged each department to promote relevant measures. Therefore, the DGBAS projects the annual CPI and WPI inflation rates in 2012 to register 1.84% and 1.49%, respectively.[35]

The CBC raised policy rates twice and then kept them unchanged

In the first half of 2011, global economic growth was robust and the domestic economy grew steadily. As market interest rates moved up gradually, along with heightened inflationary pressures, the CBC twice raised its policy rates by 0.125 percentage points in March and June to contain inflation expectations (Table 2.1).

However, during the second half of 2011, the impact of the European sovereign debt crisis was no longer confined to the financial sector but also spilled over to the real sector. Moreover, the US economy continued to be mired in a political stalemate over fiscal consolidation, a faltering housing market and high unemployment. These lingering concerns combined to make international financial markets turbulent. Such global economic and financial uncertainties have increased, and this may adversely affect Taiwan's economic growth. However, at the same time, inflation expectations have abated. Against this backdrop, the CBC decided to keep policy rates unchanged on three occasions in order to ensure price and financial stability, and further sustain sound economic growth.

Table 2.1 CBC policy interest rates

Effective date	Discount rate	The rate on accommodations with collateral	The rate on accommodations without collateral
1 July 2011	1.875	2.250	4.125
1 April 2011	1.750	2.125	4.000
31 Dec. 2010	1.625	2.000	3.875
1 Oct. 2010	1.500	1.875	3.750
25 June 2010	1.375	1.750	3.625
19 Feb. 2009	1.250	1.625	3.500

Source: CBC.

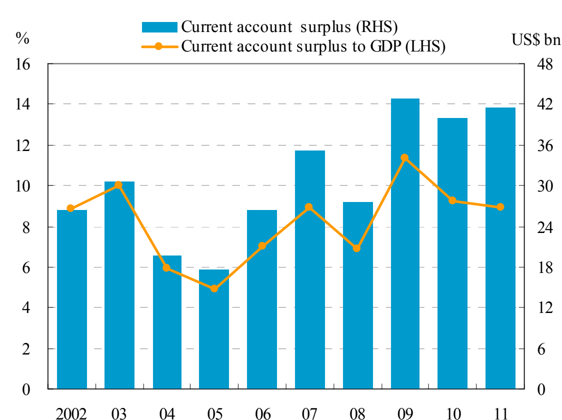
[35] See Note 32.

Current account surpluses persisted and foreign exchange reserves stayed abundant

In 2011, the rise in exports was larger than that in imports, making Taiwan's merchandise trade surplus trend up. Moreover, travel income markedly increased and resulted in a surplus in services. Hence, the annual current account surplus reached US$41.6 billion, or 8.91% of annual GDP[36], increasing by US$1.7 billion or 4.29% compared to 2010 (Chart 2.14). As for the financial account, in 2011, direct investments and portfolio investments both saw net outflows. The capital outflows on the financial account were mainly contributed to by a considerable expansion of business activities in Mainland China by Taiwanese companies and foreign investors' sales of stocks and government bonds, despite the fact that foreign stock certificate redemptions and spillovers from the European sovereign debt crisis brought about some capital inflows. During the same period, other investments[37] somewhat offset the above-mentioned capital outflows effect, but the annual balance of outflows in the financial account still registered US$32.2 billion, notably higher than US$0.3 billion the previous year. With the current account surplus and sharp outflows in the financial account, the balance of payments surplus registered US$6.2 billion in 2011, a significant decrease of 84.47% from a year earlier.

In the first half of 2011, the steady balance of payments surplus together with continuously accumulated earnings on investments made with foreign exchange reserves contributed to ascending foreign exchange reserves, which reached US$400.8 billion in July. However, as a result of net stock selling by foreign institutional investors and foreign stock certificate redemptions by domestic investors due to the tepid global economy and European sovereign debt crisis, foreign exchange reserves declined slightly to US$385.5 billion at the end of 2011, resulting in an increase of only 0.93% compared to the previous year. However, at the end of April 2012, the number had climbed back to

Chart 2.14 Current account surplus



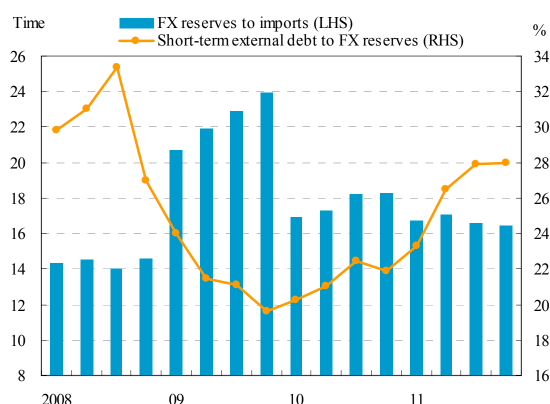
Note: Current account surplus and GDP are annual figures.
Sources: CBC and DGBAS.

[36] For the ratio of current account deficit to GDP, the cutoff point for risk is 3%. A country in which the reading is greater than 3% and has risen by at least 5 percentage points from the previous year is considered to be at relatively high risk.

[37] Two parts mainly contributed to the net inflows from other investment in 2011. In the banking sector, it included the redemption of foreign loans and a rise in both the inbound remittance of funds from banks' foreign branches and the deposits received from non-residents. In the private sector, it resulted from the withdrawal of foreign deposits.

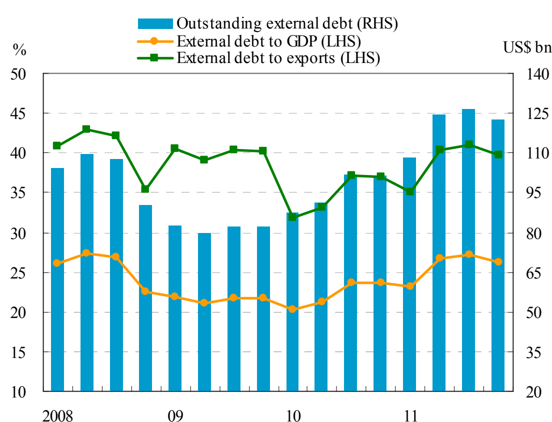
US$395.1 billion, reflecting ample foreign exchange reserves. Nevertheless, the ratio of foreign exchange reserves to imports declined to 16.44 months,[38] led by growth in imports. Furthermore, the ratio of short-term external debt to foreign exchange reserves substantially elevated to 27.96%[39] owing to a notable expansion in short-term external debt. These two ratios, nevertheless, were still below internationally recognized warning levels. Consequently, this implies that Taiwan's foreign exchange reserves have a robust capacity to meet payment obligations for imports and to service short-term external debt (Chart 2.15).

Chart 2.15 Short-term external debt servicing capacity



Notes: 1. FX reserves and external debt are end-of-period figures.
2. Imports are average monthly figures.
Sources: CBC, DGBAS and MOF.

Chart 2.16 External debt servicing capacity



Notes: 1. External debts are end-of-period figures.
2. GDP and exports are annual figures.
Sources: CBC, DGBAS and MOF.

External debt contracted after following an upward trajectory and debt-servicing capacity remained strong

There was a substantial increase in Taiwan's external debt[40] in the first three quarters of 2011, resulting from domestic banks borrowing funds from overseas and the increase of NT dollar deposits held by non-residents. However, external debt slightly decreased in 2011 Q4 as a result of the reduction in debt owned by foreign institutional investors. Overall, outstanding external debt stood at US$122.5 billion, or 26.27% of annual GDP, at the end of 2011, implying a moderate level of external debt.[41] Moreover, the ratio of external debt to annual exports was 39.75% as of the end of 2011, indicating that export revenues were still sufficient to cover external debt

[38] A country with a ratio of foreign exchange reserves to imports of more than three months is considered to be at relatively low risk.

[39] The general international consensus is that a ratio of short-term external debt to foreign exchange reserves less than 50% indicates relatively low risk.

[40] The CBC defines external debt as the combined amount owed to foreign parties by Taiwan's public and private sectors, including long-term debt with a maturity of greater than one year and short-term debt with a maturity of one year or less. The term "public external debt" refers to debt that the public sector is either obligated to repay directly or has guaranteed (starting from December 2004, figures for public external debt include outstanding foreign debt arising from repo transactions between the CBC and international financial institutions). The term "private external debt" refers to private-sector foreign debt that is not guaranteed by the public sector.

[41] The general international consensus is that a country with a ratio of external debt to GDP lower than 50% is deemed to be at relatively low risk.

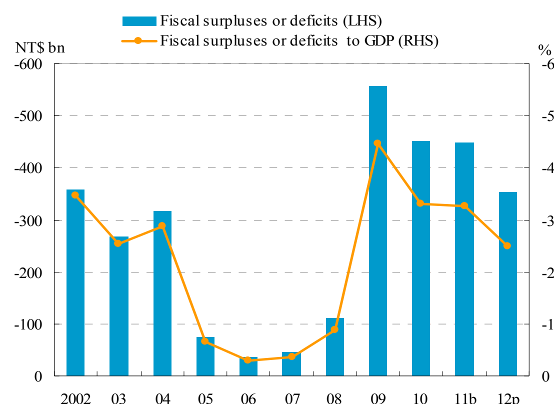
(Chart 2.16), and there were no signs of servicing pressure on external debt.[42]

Fiscal deficits turned to contract while government debt kept accumulating

Since most of the temporary infrastructure construction expenditures in order to spur the economy harmed by the global financial crisis and Typhoon Marakot had ended, government investment contracted from 2010 onwards, and fiscal deficits at all levels of government continued to decline to NT$449 billion in 2011. This, combined with the sustained GDP growth of the same year, caused the ratio of fiscal deficit to annual GDP to decline to 3.27% in 2011, and it is expected to further drop to 2.50% in 2012[43] (Chart 2.17).

As fiscal deficits stayed high and central and local governments relied on debt issuance to finance debt servicing expenditures, outstanding public debt at all levels of government[44] expanded to NT$5.59 trillion, or 40.67% of annual GDP[45], well above the NT$5.19 trillion[46] recorded in 2010. It is expected that public debt will further grow and stay high in 2012 with the ongoing implementation of a bundle of medium-term infrastructure projects (Chart 2.18).

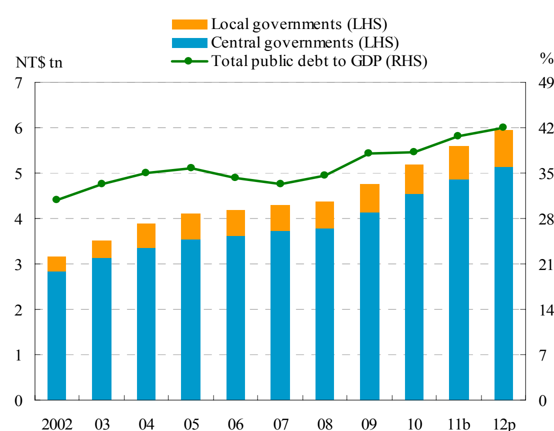
Chart 2.17 Fiscal position



Notes: 1. Fiscal position data include those of central and local governments.
2. Data of fiscal surpluses (deficits) are annual figures. Figures for 2011 and 2012 are budget and proposal accounts, respectively.

Sources: MOF and DGBAS.

Chart 2.18 Public debt



Notes: 1. Outstanding public debt refers to non-self-liquidating debt with a maturity of one year or longer, excluding external debt.
2. Data of fiscal surpluses (deficits) are annual figures. Figures for 2011 and 2012 are budget and proposal accounts, respectively.

Sources: MOF and DGBAS.

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[42] The general international consensus is that a ratio of external debt to exports less than 100% indicates relatively low risk.

[43] To provide more context, fiscal deficits in EU member nations are not allowed to exceed 3% of GDP, based on. the 1992 European Union Maastricht Treaty and the subsequent Stability and Growth Pact.

[44] The term "outstanding debt at all levels of government" as used in this report refers to outstanding non-self-liquidating debt with a maturity of one year or longer. The budgeted figures for outstanding one-year-or-longer non-self-liquidating public debt (NT$5.59 trillion) issued by all levels of government during the 2011 fiscal year is equivalent to 42.06% of the average GNP for the preceding three fiscal years (NT$13.29 trillion). This figure is below the ceiling of 48% (i.e. 40% for central government and 8% for local governments) set out in the Public Debt Act.

[45] As a comparison, outstanding debt in EU member nations is not allowed to exceed 60% of GDP, according to the Maastricht Treaty and the subsequent Stability and Growth Pact.

[46] If adding in debt with a maturity of less than one year and self-liquidating debt, outstanding public debt at the end of 2010 stood at NT$6.41 trillion.

To promote fiscal health, Taiwan's government unveiled the golden 10-year prospects outline in October 2011. In the outline, the fourth item of the comprehensive blueprint that aims for enhancing a sound fiscal system includes five strategies: diversified sources of government funds, industrialized government finance, just taxation, optimized local finance and minimized public debt. It is expected that healthy finance and fair taxation can be fulfilled through these strategies.

Box 1
The practice of stress testing the banking sector in Taiwan

The global financial crisis drew increasing attention to the need for developing stress testing models that can identify systemic risk in a financial sector. Against this backdrop, both the Financial Supervisory Commission (FSC) and the CBC devoted efforts to developing adequate stress testing frameworks that could assess adverse impacts on the banking sector and its risk-bearing capability to withstand shocks caused by extreme but plausible macroeconomic conditions.

1. The FSC requires domestic banks to conduct a stress test at least annually under pillar 2 of Basel II

In order to urge domestic banks to place importance on stress testing and enhance their capability of implementation, the FSC required domestic banks to conduct stress tests on bank-specific market risk and credit risk in 2010 and 2011, respectively, according to the requirement of pillar 2 of Basel II. These stress tests were performed to estimate one-year-ahead potential losses and their impact on individual banks' capital adequacy ratios (CARs) under the stressed scenarios, and the test results are required to be submitted to the FSC to serve as a reference for financial supervision. The results released by the FSC showed that: (1) the average CARs of domestic banks were above the regulatory minimum of 8%; and (2) all banks could meet the minimum regulatory standard after recapitalization and asset reallocation.

2. The CBC developed macro stress testing models

In accordance with the operational objective that aims at promoting financial stability, the CBC has recently been developing macro stress testing models with a view to assessing the resilience of the whole banking system against adverse macroeconomic and financial shocks. Initially, the CBC cooperated with domestic academics to develop stress testing models from 2007 onwards. These models, which intend to offer a quantitative analysis of the potential fragilities in the domestic banking sector, are viewed as a cornerstone for the development of the CBC's macro stress testing framework.

In 2010, the CBC established a macro stress testing model of market risks.[1] In terms of sensitivity analysis and scenario simulation, this model was developed to gauge the effects of different market shocks[2] on individual banks' CARs and Tier-one capital ratios using their market exposure positions during 2007 to 2009, and in turn to assess domestic

banks' risk-bearing capabilities in abnormal market conditions. Specifically, a macroeconomic model was then built to verify whether the parameters of the stressed scenarios could be mapped onto the macroeconomic environment by means of a Vector Autoregression (VAR) analysis. The empirical result suggested that domestic banks' capital levels were generally resilient to withstand the market risk shocks simulated by the stress tests done by the CBC.

In 2011, the CBC further developed a framework which was carried out in a top-down fashion for stress testing the credit risk of the banking sector in Taiwan.[3] A macroeconometric model was used to analyze the statistical correlation between the default rates of banks' portfolios and relevant macroeconomic variables (such as Taiwan's real GDP, global real GDP, global exports, interest rates, property prices and unemployment rates). Additionally, a satellite model was applied to link a measurement of the credit risks to the variables that proxy macroeconomic conditions and to map the external macroeconomic shocks onto banks' balance sheets. Accordingly, one-year-ahead potential credit losses for domestic banks' loan portfolios could be estimated so as to scrutinize the effect of shocks on banks' overall profitability and capital adequacy under different macroeconomic stressed scenarios. In the model-based stressed scenarios, the result showed that the banking sector as a whole, given the one-year-ahead predicted values of overall profit and regulatory capital, was well equipped to withstand the impact of adverse macroeconomic conditions on banks' credit risk exposures.

Notes: 1. The CBC's macro testing model of banks' market risk was mainly based on the stress testing template created by Martin Čihák (2007). However, this model also referred to the stress test process in the context of the Financial Sector Assessment Program (FSAP) of the IMF and the methodology of a domestic research project that was outsourced by the CBC for stress testing the financial system in Taiwan.

2. These shocks include the adverse movement of foreign exchange rates, interest rates and equity prices.

3. The CBC's macro stress testing model of banks' credit risk mainly referred to a similar model employed by the Hong Kong Monetary Authority, the methodologies in CBC outsourced papers and other relevant papers. The framework consists of a macroeconomic model and Monte Carlo simulations with stress tests. In the macroeconomic model, the seemingly unrelated regression (SUR) method was applied to estimate the relationship between the default rates of bank loans and different macroeconomic values based on historical data. A variance-covariance matrix was in turn used to capture the joint error terms between macroeconomic variables and the logit-transformed default rates of bank loans. Multivariate regression analysis was then carried out to determine the macroeconomic variables which exhibited considerable explanatory power or a strong correlation with the sector-specific default rate. Under the Monte Carlo simulation, 10,000 future paths of one-year-ahead values of probabilities of default (PDs) were simulated

based on the SUR estimates, and in turn the simulated 10,000 PDs could be applied to construct a frequency distribution of credit losses for each of the baseline and stressed scenarios.

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