

where necessary, to mitigate various risks.

- Under the US Dodd-Frank Wall Street Reform and Consumer Protection Act of July 2010, the Financial Stability Oversight Council (FSOC), composed of the head of supervisory agencies in the US, is charged with monitoring and addressing systemic risks arising from large financial institutions, financial instruments and financial activities.
- In the UK, the Financial Policy Committee (FPC) was set up under the Bank of England to monitor the macroeconomic and financial issues that may threaten the resilience of the financial system, and to adopt macroprudential tools.

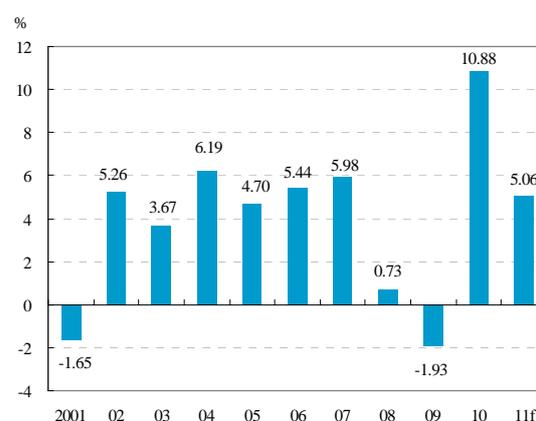
## 2.2 Domestic economic and financial conditions

Taiwan's economy saw solid growth through 2010 with stable commodity prices. 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 but at a moderate pace, and overall external debt servicing ability stayed robust. The government's fiscal deficits shrank, whereas government debt elevated.

### *Domestic economy expanded at a robust pace*

In the first quarter of 2010, economic growth rebounded to 13.59%, a record-high since 1978 Q4 and sustained a high level of 12.86% in the following quarter. These high growth rates mainly were underpinned by sharp growth in exports which resulted from brisk foreign demand due to gathering momentum in the global economic recovery, upward momentum in private investment, mild growth in private consumption, and a lower base compared to a year earlier. In the second half of the year, private investment continued to expand alongside rising private consumption. But meanwhile economic growth turned to moderate, registering 10.69% and 7.3% in the last two quarters of 2010, respectively, on the back of slowing growth momentum alongside the continued influence of a high base in the previous year.

**Chart 2.13 Economic growth rates in Taiwan**



Note: Figure for 2011 is forecast by DGBAS.  
Source: DGBAS.

Based on DGBAS statistics, annual economic growth registered a robust 10.88% in 2010,<sup>26</sup> the highest annual growth rate recorded since 1987, from -1.93% in 2009 (Chart 2.13).

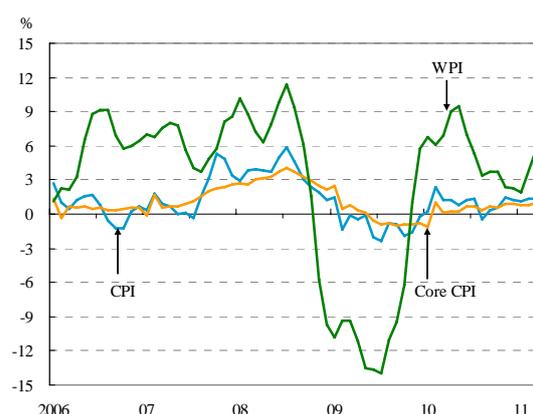
From the start of 2011 onwards, exports expanded steadily and private consumption performed well. However, affected by the influence of a much higher base, the DGBAS preliminary statistics show that the output growth rate stood at 6.55% in the first quarter of 2011 and may decline to 5.06% for the year as a whole<sup>27</sup> (Chart 2.13). Moreover, domestic automobile, electronics and telecommunication industries, which heavily rely on key components as well as machinery and equipment from Japan, could take an adverse hit as a result of supply disruption following the recent earthquake and tsunami in Japan. Meanwhile, the number of Japanese tourists visiting Taiwan is estimated to decline in the short term. Nevertheless, this unfavorable impact may have been offset to some extent by the fact that many domestic firms subsequently benefited from offering capacity support to Japanese firms or receiving transfer orders from customers. Therefore, the overall impact of Japan's earthquake on Taiwan's economy is generally expected to be limited.<sup>28</sup>

### Domestic prices remained stable

From the beginning of 2010 onwards, the international prices of agricultural and industrial raw materials (such as of crude oil, natural gas, and grains) exhibited large increases compared to the same period of the previous year. Reflecting this, together with a lower base, the wholesale price index (WPI) inflation rate visibly rose before gradually declining after hitting a peak of 9.43% in May 2010. The annual WPI inflation rate stayed at 5.46% in 2010, far above the -8.74% recorded a year earlier.

Driven by the upsurge in retail prices of gasoline and imports owing to increasing costs, coupled with the deferred effects of imposing a higher tax on tobacco in June 2009 and soaring overseas travel fares, the CPI inflation rate moved within a range of

**Chart 2.14 Consumer and wholesale price inflation rates**



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

<sup>26</sup> The figures are based on the DGBAS press release on 19 May 2011.

<sup>27</sup> See Note 26.

<sup>28</sup> According to Global Insight analysis, Taiwan, South Korea and Thailand are more vulnerable than other Asian economies to sustained disruptions in Japanese output. The impact, which is expected to be relieved in the second half of 2011, would not pose any serious threat to those economies.

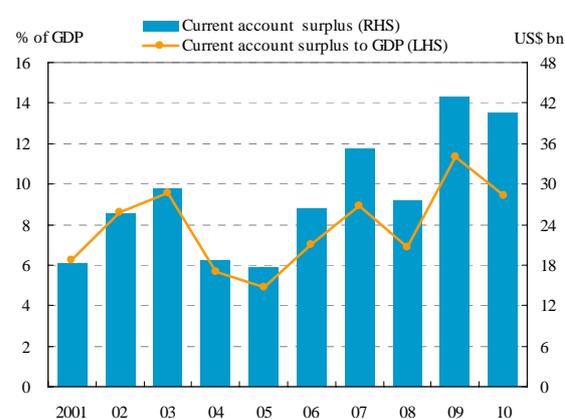
0.2% to 2.4% in 2010, except for a negative recording in August due to the influence of a high base in the prices of certain commodities and products (for example, gas, cars, motorcycles and vegetables) a year earlier. In parallel, the core CPI<sup>29</sup> inflation rate mostly remained below 1% during the same period (Chart 2.14). The annual headline CPI and core CPI inflation rates in 2010 were 0.96% and 0.44%, respectively, higher than the -0.87 and -0.14% a year earlier. This showed a stable price level for the year 2010.

The average WPI inflation rate from January to April 2011 dropped to 4.04%, while the average CPI and core CPI inflation rates continued to accelerate by 1.29% and 0.89%,<sup>30</sup> respectively, over the same period, revealing that commodity prices increased somewhat in the earlier part of 2011 (Chart 2.14). Looking ahead, fueled by the still-strong global demand, shortage of supply due to adverse weather conditions, and ample liquidity in markets, the prices of crude oil and agricultural and industrial raw materials are expected to keep surging. This will further push domestic wholesale and retail prices up. The DGBAS projects the annual WPI and CPI inflation rates in 2011 to register 3.42% and 2.10%,<sup>31</sup> respectively.

### Current account surpluses persisted and foreign exchange reserves stayed abundant

Taiwan's imports and exports both saw visible increases in 2010 thanks to the ongoing global economic recovery and solid growth in emerging Asian economies. Despite the fact that the trade surplus was slightly lower than a year earlier as the rise in imports was larger than that of exports, the current account surplus still persisted and registered US\$40.62 billion through the whole of 2010, or 9.44% of annual GDP<sup>32</sup> (Chart 2.15). As for the financial account, massive net inflows from other investments<sup>33</sup> mostly offset sustained

Chart 2.15 Current account surplus



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

<sup>29</sup> The term "core CPI" in this report refers to the consumer price index excluding perishable fresh fruits and vegetables, fish and shellfish, and energy.

<sup>30</sup> The figures are based on a DGBAS press release on 5 May 2011.

<sup>31</sup> See Note 26.

<sup>32</sup> 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.

<sup>33</sup> The "net inflows from other investment" was mainly contributed to by two parts in 2010. 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.

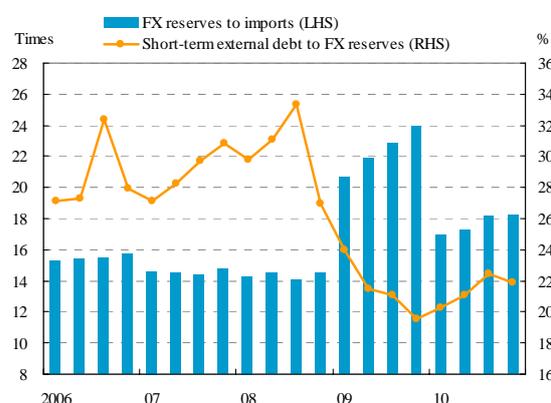
net outflows from direct investments and portfolio investments, leading to a shrinkage in the annual balance of net outflows in the financial account of US\$0.61 billion. Over the same period, the balance of payments recorded a surplus of US\$40.17 billion as result of the sizable current account surplus and small net outflows in the financial account.

The continuous balance of payments surplus, coupled with the fact that major currencies (such as the euro) held as part of Taiwan's foreign exchange reserves appreciated against the US dollar over the same period, pushed foreign exchange reserves to continue accumulating to record highs and register US\$382 billion at the end of 2010, and further climb to US\$399.5 billion at the end of April 2011. This reflects ample foreign exchange reserves. Nevertheless, the ratio of foreign exchange reserves to imports declined to 18.25 months,<sup>34</sup> led by excessive growth in imports. Furthermore, the ratio of short-term external debt to foreign exchange reserves elevated to 21.90%<sup>35</sup> owing to a notable expansion in short-term external debt (Chart 2.16). These two ratios, nevertheless, were still below internationally recognized warning levels. 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.

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

There was a substantial increase in Taiwan's external debt<sup>36</sup> in the first three quarters of 2010 resulting from a sharp upsurge in private external debt. However, external debt decreased somewhat in 2010 Q4, triggered by the reduction in debt owed by domestic banks to foreign banks and the balance of NT dollar deposits held by non-residents. Overall, outstanding

**Chart 2.16 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.

<sup>34</sup> A country with a ratio of foreign exchange reserves to imports more than three months is considered to be at relatively low risk.

<sup>35</sup> The general international consensus is that a reading of less than 50% indicates relatively low risk.

<sup>36</sup> External debt is defined by the CBC 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.

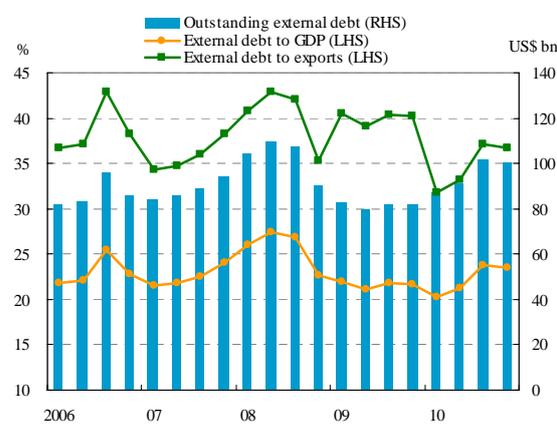
external debt stood at US\$100.8 billion, or 23.43% of annual GDP, at the end of 2010, implying a low level of external debt.<sup>37</sup> Moreover, the ratio of external debt to annual exports declined to 36.70% as of the end of 2010, due to the strong rebound in exports, indicating that export revenues were still sufficient to cover external debt (Chart 2.17), and there were no signs of servicing pressure on external debt.<sup>38</sup>

### Fiscal deficits turned to contract while government debt stayed elevated

Driven by the expansion of infrastructure construction expenditures undertaken with the aim of revitalizing the economy, fiscal deficits increased sharply and reached a historical high in 2009. However, these declined in 2010 and registered NT\$526.4 billion, partly because fixed capital investments of the government and state-run enterprises contracted gradually with the fall in major infrastructure construction demand. This, coupled with healthy GDP growth, caused the ratio of fiscal deficit to annual GDP to decline to 3.07% in 2011,<sup>39</sup> following a drop to 3.87% in 2010 (Chart 2.18).

In 2010, outstanding public debt at all levels of government<sup>40</sup> expanded to NT\$5.10 trillion, or 37.48%<sup>41</sup> of annual GDP, well

Chart 2.17 External debt servicing capacity

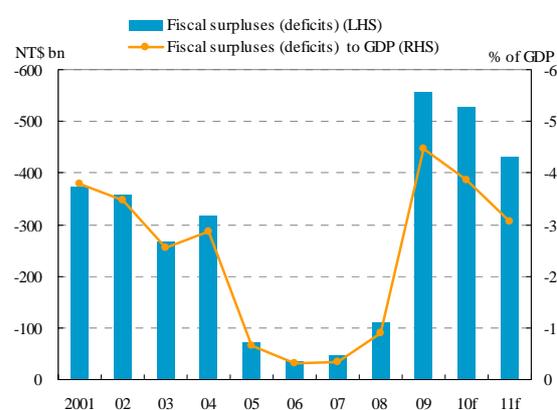


Notes: 1. External debt are end-of-period figures.

2. GDP and exports are annual figures.

Sources: CBC, DGBAS and MOF.

Chart 2.18 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 2010 and 2011 are budget accounts.

Sources: MOF and DGBAS.

<sup>37</sup> 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.

<sup>38</sup> The general international consensus is that a ratio of external debt to exports of less than 100% indicates relatively low risk.

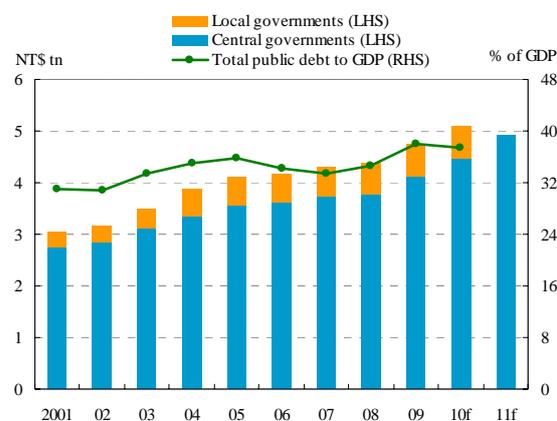
<sup>39</sup> In contrast with the 1992 European Union Maastricht Treaty and the subsequent Stability and Growth Pact, fiscal deficits in EU member nations are not allowed to exceed 3% of GDP.

<sup>40</sup> 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. Final audited figures for outstanding one-year-or-longer non-self-liquidating public debt (NT\$5.10 trillion) issued by all levels of government during the 2010 fiscal year is equivalent to 39.15% of the average GNP for the preceding three fiscal years (NT\$13.02 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.

<sup>41</sup> In contrast with the Maastricht Treaty and the subsequent Stability and Growth Pact, outstanding debt in EU member nations is not allowed to exceed 60% of GDP.

above the NT\$4.75 trillion<sup>42</sup> in 2009, as fiscal deficits stayed high and governments relied on debt issuance to finance debt servicing expenditures. It is expected that public debt will further grow at a firm pace in 2011 with the ongoing implementation of large-scale infrastructure projects<sup>43</sup> (Chart 2.19).

Chart 2.19 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. Outstanding public debt for 2010 and 2011 are budget accounts; the 2011 number for local governments is not available.

Sources: MOF and DGBAS.

<sup>42</sup> If adding in debt with a maturity of less than one year and self-liquidating debt, outstanding public debt at the end of 2009 stood at NT\$5.83 trillion.

<sup>43</sup> Refer to the “i-Taiwan 12 projects,” which are expected to raise a total investment of NT\$3.99 trillion via private investment and government budget in twelve prioritized infrastructure projects within eight years.

**Box 1****Recent measures to manage capital flows in emerging economies**

From the second quarter of 2009 onwards, rebounded investor risk appetite and continued low interest rate policies in advanced economies, coupled with an upturn of economic prospects in emerging economies, fueled strong capital inflows for portfolio investment into emerging Asian and Latin American economies, and consequently raised concerns about the mounting risks of inflation and asset price bubbles. In response, many Asian and Latin American economies successively launched a variety of measures to manage capital flows since 2010, including imposing taxes on foreign investors for their inbound remittances, placing ceilings on foreign exchange positions held by financial institutions or corporations, and easing restrictions on domestic funds for offshore investments. The key components of these measures are summarized in Table B1.1.

**Table B1.1 Recent capital flow management measures in selected emerging economies**

<b>Economies</b>	<b>Date</b>	<b>Measures</b>
South Korea	October 2010	<ol style="list-style-type: none"> <li>1. Capped corporate foreign exchange hedging limit to 100% of export receipts.</li> <li>2. Set a ceiling on foreign exchange (FX) forward positions of domestic banks to 50% of equity capital.</li> <li>3. Set a ceiling on FX forward positions of foreign bank branches to 250% of equity capital.</li> </ol>
	19 October 2010	Inspected banks involved in FX derivative activities.
	January 2011	Proposed to impose a tax on the purchase/sale of depository receipts: <ol style="list-style-type: none"> <li>1. Imposed a levy on either 22% of capital gains or 11% of initial public offering (IPO) funds, whichever is lower.</li> <li>2. Imposed a 0.3% tax on exchange transactions, and 0.5% on over-the-counter (OTC) transactions.</li> </ol>
	1 January 2011	Reimposed a 15.4% withholding tax on interest income and 22% on capital gains for all foreign holdings of short-term government bonds.
	March 2011	Lowered limits on domestic banks' FX forward positions from 50% of equity capital to 40%, and foreign bank branches from 250% to 200%.
	Date to be determined	Proposed to impose a 0.2% tax on less-than-one year tenor foreign currency loans by domestic banks, a 0.1% tax on 1-3 year tenor loans, a 0.05% tax on 3-5 year tenor loans and a 0.02% tax on above 5-year tenor loans. This proposal, expected to be submitted to the congress in May 2011, could be effective from 1 July 2011 given the passage of the bill.
Thailand	16 September 2010	Relaxed five regulations relating to the banning capital outflows, including: <ol style="list-style-type: none"> <li>1. Removed the cap on offshore direct investments by Thai</li> </ol>

		<p>corporations.</p> <p>2. Relaxed the limit on the provision of credit by Thai corporations to non-related enterprises to USD50 million per year.</p> <p>3. Increased the limit on offshore purchases of real estate by Thai corporations to USD10 million per year.</p> <p>4. Raised the ceiling on foreign currency deposits held by Thai corporations to USD500 thousand from USD300 thousand.</p> <p>5. Raised the cap on offshore foreign currency deposits held by Thai exporters to USD50 thousand from USD20 thousand.</p>
	12 October 2010	Companies with FX revenues are allowed to transfer FX funds from their local FX account to onshore counterparties. FX transactions below USD50 thousand only need to provide documentation on remittance purposes.
	13 October 2010	Revoked the waiver on a 15% withholding tax on interest income and capital gains on foreign investments in government bonds.
Indonesia	17 June 2010	<p>1. Introduced a one-month holding period on Bank Indonesia Certificates (SBIs) and issued nine- and twelve-month SBIs.</p> <p>2. Expanded the difference between the overnight call rate and the Bank Indonesia rate to 2% from 1%.</p>
	January 2011	Capped banks' short-term FX borrowing to 30% of equity capital.
	March 2011	Raised required reserves on FX positions held by banks to 5% from 1% in March 2011, and further increased it to 8% in June 2011.
Taiwan	2 August 2010	Imposed a US dollar denominated margin for short sale accounts held by foreign investors.
	11 November 2010	Reinstated a 1995 rule that caps foreign investments of nonresident inbound remittances at 30%, to include government bonds.
	27 December 2010	Reduced the limit of the add-up position of local currency non-delivery forwards (NDFs) and options to one-fifth of total position from one-third.
	1 January 2011	Raised required reserves on local currency demand deposit accounts held by nonresidents to 90% from 9.775% on the increment exceeding the outstanding balance recorded on 30 December 2010, and 25% (from 9.775%) on balances below the end-2010 level. Required reserves for such accounts are non-remunerated.
Brazil	20 October 2009	Imposed a 2% IOF tax (financial operations tax) on foreign exchange inflows for the purchase of Brazilian equities instruments and fixed income instruments.
	19 November 2009	Imposed a 1.5% tax on American Depository Receipts (ADR) issued by Brazilian corporations.
	1 April 2010	Imposed a 0.38% tax on FX outflows when converting Depository Receipts (DR) to local shares.
	5 October 2010	Raised the IOF tax on foreign exchange inflows for the

		purchase of fixed income instruments to 4% from 2%.
	20 October 2010	1. Further increased the IOF tax on foreign exchange inflows for the purchase of fixed income instruments to 6% from 4%. 2. Raised the futures margin to 6% from 0.38%.
	4 April 2011	Banks are required to deposit cash in the Brazilian central bank account to cover 60% of short positions, given that their holdings of US dollar denominated short positions either exceed USD3 billion or their equity capital, whichever is lower. Deposits for such accounts are non-remunerated.

Sources: CBC, IMF April 2011 GFSR, Nomura Global Economics and BNY Mellon NetInfo.

**Box 2****Basel III: capital and liquidity reform**

Regarding recent global financial turmoil, the main reasons the financial crisis became so aggravated were that the banking sector employed excessive leverage, maintained an inadequate and deteriorated capital base and held insufficient liquidity buffers. The crisis was further amplified by a procyclical deleveraging process and the interconnectedness of systemically important financial institutions, resulting in significant global economic loss. To address these issues, the Basel Committee on Banking Supervision (BCBS) has introduced a number of capital and liquidity reforms<sup>1</sup> (Basel III) since 2009, which were finalized and published in December 2010 after endorsement by the G20 leaders at their November Seoul Summit.

***1. Basel III: capital and liquidity reforms***

The Basel III reforms not only emphasize microprudential supervision that raise the resilience of individual financial institutions when facing stressed conditions, but also have a macroprudential focus that helps to reduce the potential impacts coming from common exposures of banks and procyclicality.

**1.1 Microprudential supervision reforms**

The microprudential supervision reforms introduced in Basel III include three parts: (1) strengthening capital and liquidity regulations of individual banks; (2) enhancing related financial supervision, risk management and internal governance; and (3) reinforcing market discipline. The first part, capital and liquidity reforms, will significantly influence the global banking industry, and is described as follows.

**Strengthening regulatory capital frameworks*****Raising capital quality***

Banks are required to raise their capital quality, which includes employing common equity as the predominant form of capital along with a stricter definition of common equity. Furthermore, the BCBS further requests banks, when issuing non-common Tier 1 and Tier 2 instruments, to incorporate provisions that require such instruments to either be written off or converted into common equity once they are determined to be non-viable by the relevant authorities.<sup>2</sup>

***Enhancing risk coverage***

With regard to securitization transactions, Basel III introduces higher risk-weights for complex securitization financial instruments and raises the capital charge for off-balance sheet exposures, while requiring banks to adopt more careful credit analyses on securitization transactions. Regarding trading book transactions, Basel III requires banks to calculate stressed value-at-risk at least every week and set aside additional capital charges accordingly, while banks using models to calculate specific risk are subject to the incremental risk capital charge. Additionally, Basel III also urges banks to strengthen capital charges and risk management for counterparty risk.

#### *Increasing capital ratios*

In order to enhance the loss absorbing capacity of banks, Basel III raises the common equity Tier 1 ratio from 2% to 4.5% and Tier 1 capital ratio from 4% to 6%, while asking for an additional capital conservation buffer of 2.5%, comprising only common equity, and a countercyclical capital buffer of 0-2.5%.<sup>3</sup>

#### *Introducing a leverage ratio*

Basel III introduces a non-risk based leverage ratio, which is calculated by dividing Tier 1 capital by total assets. The Tier 1 capital for the leverage ratio should be based on the new definition set out in Basel III, while total assets consists of on- and off-balance sheet assets. The preliminary leverage ratio is 3% and will commence in a parallel run starting from 1 January 2013. Any adjustments to the leverage ratio will be carried out in the first half of 2017 and the leverage ratio will be migrated to a Pillar I treatment on 1 January 2018.

### **Proposing international liquidity standards**

During financial crises, liquidity can evaporate very quickly. In response, the BCBS has developed two minimum standards for funding liquidity, including: (1) the Liquidity Coverage Ratio (LCR) to strengthen banks' resilience to short-term liquidity needs; and (2) the Net Stable Funding Ratio (NSFR) to improve the problem of liquidity mismatch for banks over a longer time horizon. The minimum requirement for both ratios is 100%.

## **1.2 Macroprudential supervision reforms**

### **Reducing procyclicality**

In order to reduce procyclicality, the BCBS has proposed two capital requirements related to macroprudential supervision, including a capital conservation buffer and a

countercyclical capital buffer, and suggested that the International Accounting Standards Board (IASB) adopt an expected loss approach for provisioning. The capital conservation buffer is designed to ensure that banks hold additional capital of 2.5% above the regulatory minimum. Restrictions on capital distribution will be imposed on banks if their capital conservation buffer falls below 2.5% so as to retain their capital. Regarding the countercyclical capital buffer of 0-2.5%, Basel III requires national authorities to monitor domestic credit growth with reference to the ratio of credit to GDP and other related indicators and apply adequate judgments in determining the size of such buffers.<sup>4</sup>

### **Addressing systemic risk and interconnectedness**

The BCBS and the Financial Stability Board (FSB) are developing an integrated approach, including combinations of systemic capital surcharges, contingent capital and bail-in debt, which requires systemically important financial institutions to have loss absorbing capacities beyond the minimum standards. Moreover, the BCBS is developing quantitative and qualitative indicators to assess the systemic importance of financial institutions while studying viable alternative measures to strengthen the additional loss absorbency of systemically important financial institutions and reduce the risk of spillover among such institutions, including liquidity surcharges, tighter large exposure restrictions and enhanced financial supervision. Furthermore, according to the lessons learnt from the financial crisis, the orderly resolution of cross-border problem banks is key to decreasing systemic risk and solving the too-big-to-fail problem. Therefore, setting up a resolution mechanism for cross-border banks is also an important reform issue for the BCBS.

### ***2. Potential impacts of Basel III on domestic banks***

Based on the results of a quantitative impact study of Basel III conducted by the BCBS and the FSB, the BCBS announced the granting of an eight-year transition period for banks to raise capital ratios progressively starting from 2013 until full implementation of Basel III in 2019. In Taiwan, the Financial Supervisory Commission (FSC) has conducted preliminary calculations of capital ratios in accordance with Basel III standards using banks' data as of June 2010. The results indicated that the average common equity ratio of domestic banks was 7.54%, above the standard of 7% to be implemented in 2019, and the average Tier 1 capital ratio was 7.8%, also above the standard of 7.25% set to come into effect in 2017.<sup>5</sup> In line with the eight-year phase-in period of Basel III, the FSC has announced that banks will be required to strengthen risk

absorbing capacities and meet international supervisory guidance through adequate long-term capital planning and dividend policies.

- Notes: 1. The Basel Committee on Banking Supervision (2010), “Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems” and “Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring,” December.
2. The Basel Committee on Banking Supervision (2011), “Minimum Requirements to Ensure Loss Absorbency at the Point of Non-viability,” January.
3. The Basel Committee on Banking Supervision (2010), “Guidance for National Authorities Operating the Countercyclical Capital Buffer,” December.
4. Regarding the procedures and guidance for operating the countercyclical capital buffer regime, see the publication listed in note 3.
5. The Financial Supervisory Commission (2010), press release, 16 September.

**Box 3****Systemic risks and macroprudential supervision**

Systemic risks played a role as an important accelerator in the global financial crisis which originated from the US subprime mortgage debacle in 2007 and then spilled over to the rest of the world. The crisis revealed that microprudential supervision alone was insufficient to achieve financial stability. Supervisory authorities also need to strengthen macroprudential supervision to assess and address systemic financial risks to ensure the stability of financial system.

***1. The definition and sources of systemic risks***

Systemic risk may be defined as a risk of disruption to financial services that is: (1) caused by an impairment of all or parts of the financial system; and (2) may have serious negative consequences for the real economy (IMF, BIS and FSB, 2009).

There are two potential sources of systemic risks (BOE, 2009):

- **Aggregate risks:** the risks arising from the collective tendency of financial institutions to assume excessive risk in an upswing and then to become excessively risk-averse during the downswing. It could bring about procyclical effects on real economic activities and undermine the stability of the financial sector and real economy.
- **Network risks:** the risks arising from the interconnectedness or common exposures across the system leading to joint failures of financial institutions at a given point of time.

The global financial crisis has shown that relying only on microprudential supervision of individual institutions and market discipline is insufficient to detect and mitigate systemic risks. Supervisory authorities should adopt macroprudential measures through regulations and supervisions (i.e. macroprudential supervision policies) to address the two sources of systemic risks and the spillover channels of excessive leverage and maturity mismatches in order to maintain financial stability.

***2. The international adoption of macroprudential supervision policies***

Macroprudential supervision seeks to enhance the stability of the whole financial system and, therefore, should take the interactions between the financial system and the real economy into account (BIS, 2010). According to a survey of 33 central banks in November 2009 (CGFS, 2009), it showed that macroprudential instruments mainly targeted credit growth as well as the size and composition of bank balance sheets, as

presented in Table B3.1. In fact, Asian countries implemented a variety of macroprudential instruments during the 1997 Asian financial crisis.

**Table B3.1 Macroprudential instruments adopted by central banks**

Objectives	Types of instruments	Examples
<b>Measures targeting credit growth</b>	1. Limits calibrated to borrower risk characteristics	Loan-to-value caps, loan-to income limits, foreign currency lending limits
	2. Absolute limits	Aggregate or sectoral credit growth ceilings, limits on exposures by instrument
<b>Measures targeting size and composition of bank balance sheets</b>	1. Measures to limit interconnectedness	
	(1) Limits on leverage	(1) Size-dependent leverage limits or asset risk weights, capital surcharges for systemically important institutions
	(2) Financial system concentration limits	(2) Limits on interbank exposures
	2. Measures to limit procyclicality	
	(1) Capital	(1) Time-varying capital requirements, restrictions on profit distribution
	(2) Provisioning	(2) Countercyclical/dynamic provisioning
3. Measures to address specific financial risks		
(1) Liquidity risk	(1) Loan-to-deposit limits, core funding ratios, reserve requirements	
(2) Currency risk	(2) Limits on open currency positions or on derivatives transactions	

Note: The table includes only instruments where the main or usual purpose is macroprudential. This excludes instruments such as official interest rates, emergency liquidity provisions and foreign exchange market intervention, since these are mainly used for other policy purposes, even though their usage might often have macroprudential benefits.

Source: Committee on the Global Financial System (2010).

### ***3. Macroprudential supervision policies adopted by the CBC***

Promoting financial stability is one of the operational objectives pursued by the CBC. To achieve this objective, besides adopting appropriate monetary and foreign exchange policies to provide a beneficial financial environment, the CBC has used various macroprudential tools in a timely manner in recent years, as well as serving as the lender of last resort when necessary, so as to maintain financial stability. The macroprudential tools deployed by the CBC are as follows:

- Declaring to take asset prices into consideration when setting monetary policies; promulgating the Regulations Governing the Extension of Land Collateralized Loans and Housing Loans in Specific Areas by Financial Institutions, which set limitations on loan-to-value ratios and other lending terms for real estate loans for the purposes of

enhancing credit risk management in financial institutions and maintaining financial stability.

- Strengthening macroprudential analysis and surveillance, as well as issuing the Financial Stability Report periodically to offer insight into the state of Taiwan's financial system and its potential risks and spur market participants to take responsive actions in a timely manner.
- Enhancing the prudential supervision of the liquidity of financial institutions, as well as monitoring the funding maturity structure of individual financial institutions and the overall liquidity stance in the financial system in response to the exit of the blanket deposit insurance scheme.

#### ***4. Further challenges in the future***

The importance of macroprudential supervision policies in maintaining financial stability has drawn international recognition and a high degree of attention. However, there are numerous implementation challenges, including:

- There may be tradeoffs between macroprudential policies and other policy measures. For example, central banks raising policy rates to cope with rising property prices and heightened inflationary pressures may increase the vulnerability of banking systems.
- Effective tools for assessing systemic importance are still not available. Also, supervisory tools targeting systemically important institutions, such as systemic capital and liquidity surcharges, and restrictions on credit growth, need to be further calibrated and agreed on internationally.
- Risk models and tools to evaluate systemic risks lack maturity and need to be improved. Some macroprudential supervisory tools are in the initial stages of development and their effectiveness is yet widely recognized.
- Reinforcing macroprudential supervision may involve a restructuring of the existing supervisory framework and accountability, which would have extensive effects throughout the financial system.

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