

Chapter 6: Financial resources and their management¹⁰¹

The Main Issues

Central banks need financial resources – funding and a balance sheet with which to engage the private financial sector. Access to such resources can be an important source of independence, or of influence, depending on who has control. At the same time, central bank policy decisions and operations can have large financial consequences. Finding the right balance between independence and accountability is an important issue. The main issues are as follows:

- What funding models are available for central banks? What are the implications of self-financing – paying operating costs from revenue – especially as it applies to controlling central banks' budgeted and realised expenditure?
- Who bears the financial risks associated with policy action? What role do rules for the distribution of capital and income play in managing the relationship between financial independence and policy independence?

1. Introduction

Central banks have a dual identity: they are banks as well as policy agencies. They can be large, in a financial sense, and they can have a substantial impact on the financial conditions that determine their income, while their pursuit of policy objectives has a direct bearing on their balance sheets. As public policy institutions, they are part of the state sector and thus are owned (directly or beneficially) by the government on behalf of the public. Yet they usually have a degree of independence that extends to their finances. This combination of role and position gives rise to the complex trade-offs that generally lead to the subordination of profitability considerations, as discussed in this chapter.

2. The central bank balance sheet

Central bank balance sheets¹⁰² have common elements (see Figure 29, a stylised balance sheet that would apply to most members of the Central Bank Governance Network), but their structures vary considerably (as shown in Figure 30, which uses the same colours as Figure 29 to show actual data for 90 central banks).

The balance sheet of any organisation is a sum of interdependent parts and must be analysed as such. In the case of the central bank's balance sheet, a useful starting point is to take the monetary liabilities issued by the central bank, and the assets funded from the proceeds, as the core of it. The configuration of this core is the result both of structural factors – including explicit decisions on the composition of assets and liabilities – and economic policy choices, with the latter usually dominating. This section considers the balance sheet effects of these structural and policy influences.

¹⁰¹ This chapter was prepared mainly by Bruce White.

¹⁰² Strictly speaking, the term "balance sheet" refers to the accounting representation of assets and liabilities of an organisation. The term is also commonly used to refer to the assets and liabilities themselves. This chapter mostly uses the term to mean assets and liabilities; it is clear from the context when the term is intended to be interpreted as referring to an accounting report.

Figure 29
A stylised central bank balance sheet

Total assets	Total liabilities and capital
	Currency (notes and coin)
Advances to/claims on banks	Deposits from banks
Other lending	Other domestic currency borrowings/deposits
	Bonds and securities
Government bonds/advances	Deposits from government
Foreign exchange reserves	Foreign currency borrowings
	Capital – paid up capital – retained earnings and reserves
Other assets (premises, etc)	Other liabilities

Note: The colour scheme of cells in the left and the right column does not imply a functional relationship between them, and the row heights do not imply a size relationship.

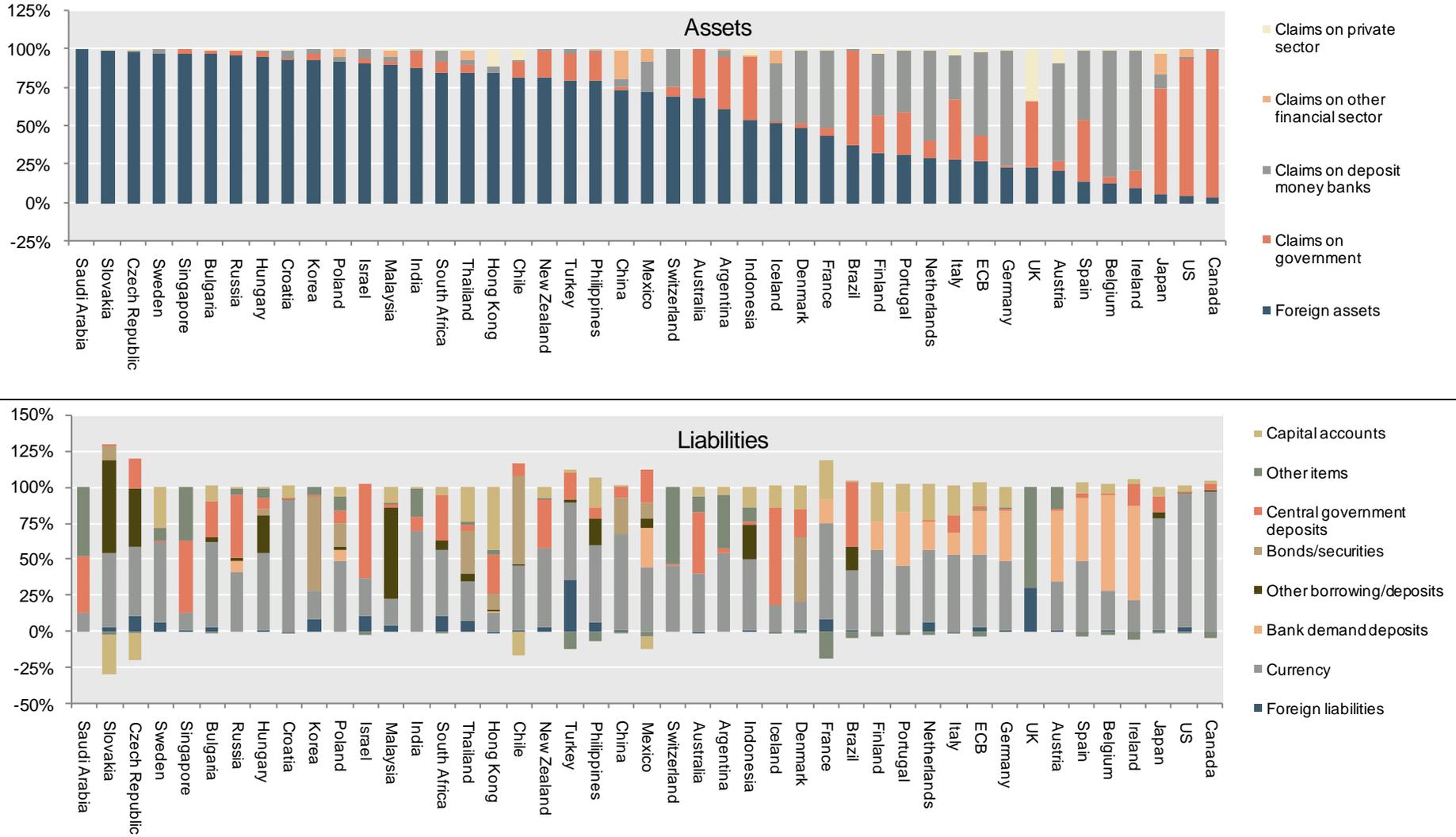
2.1 Structural factors

2.1.1 Monetary exchange

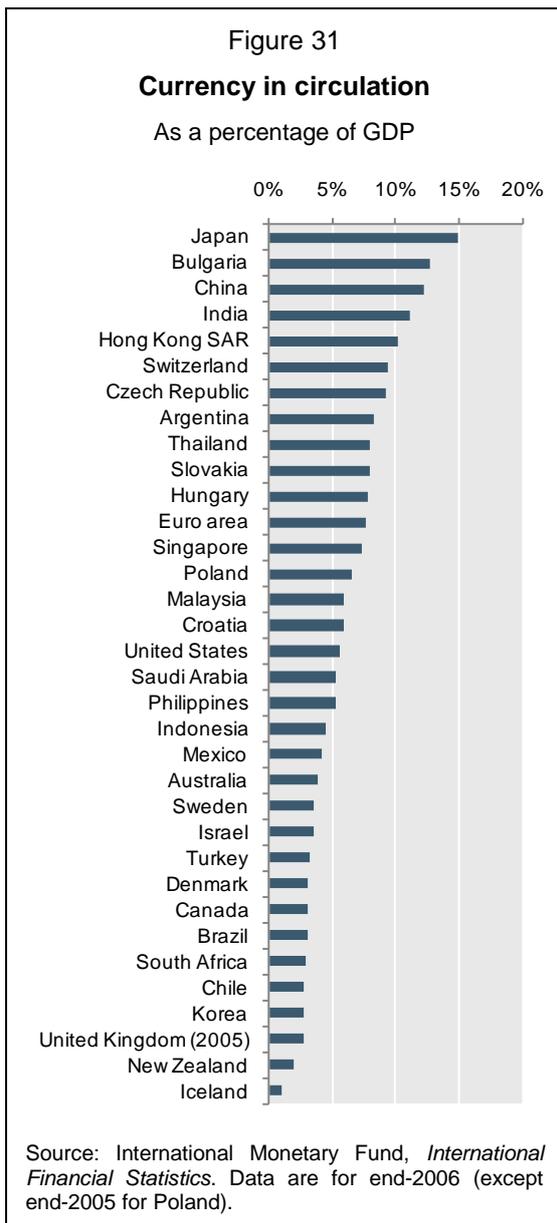
The central bank's liabilities – so-called central bank money – are at the heart of the monetary system. The liabilities consist of (1) banknotes and coins and (2) commercial bank deposits in the central bank – at least those deposits freely useable for purchasing currency and making interbank payments. The integrity of the monetary system depends on the ability to convert funds on deposit in private sector banks (so-called commercial bank money) into central bank money at par. A number of factors determine the amount of central bank money in the economy. Three important ones are as follows:

- The demand for notes and coins. Such demand varies widely across countries depending on preferences and habits that determine how willingly people use commercial bank instruments as a means of payment and store of value (Figure 31). It also depends to some extent on the degree of development of the infrastructure for retail payments and the sophistication of the financial system.
- Interbank payment arrangements, such as liquidity management policy (discussed below in the section on the influence of policy factors).
- The architecture of the interbank settlement system used by the central bank. A real-time gross settlement system requires a larger amount of intraday liquidity than does a system using end-of-day netting. The liquidity can be provided by intra-day central bank credit (as done by the Federal Reserve in its Fedwire system and by the Reserve Bank of Australia) or by banks holding sufficient liquid deposit balances at the central bank (as in New Zealand since 2006).

Figure 30
Asset and liability structures of 45 central banks



Source: International Monetary Fund, *International Financial Statistics*. Data are for end-2006 (except end-2005 for Poland).



The *share* of monetary liabilities in the balance sheet varies significantly (Figure 30) and depends on additional structural factors. These other factors include differences in the scope of functions discharged by the central bank, attitudes towards lending to the government and domestic private sector parties, and exchange rate risk. These are discussed next.

2.1.2 *Financial relations with government and the private sector*

A core issue faced by all central banks is where to invest their assets, that is, the proceeds from issuing their monetary liabilities. At least two choices are relevant: (1) foreign or domestic and (2) government or private.

As to the first choice, most central bank assets are invested predominantly in instruments denominated in foreign currencies (Figure 30). This arrangement is partly a consequence of current or historical policy choices – to be discussed shortly – but is also a reflection of the financial relationship that the central bank desires to have with the government, on the one hand, and the private sector, on the other. This follows from the fact that it is typical that foreign currency investments are investments abroad (ie with foreign governments or foreign private issuers).

Chapter 3 noted that many central banks are prohibited from lending directly to the government, or are at least the form in

which they hold government assets is restricted. The essential reason for those limits is avoidance of exposure to political pressure to adopt terms on such investments that will effectively monetise the fiscal deficit (“fiscal dominance”). Independent of other reasons for holding foreign assets (eg as ammunition for intervention or as a precaution against interruption of access to capital markets), the choice to invest abroad limits the risk of fiscal dominance.

An argument against the central bank investing abroad proceeds along the following lines: The willingness of people to hold and use central bank liabilities, even at no interest, derives from the credit standing of the central bank as an institution fully backed by the government and from legal privileges accorded to the central bank – especially monopoly rights to issue legal tender. The proceeds of issuance thus belong in some sense to the government and should be lent to the government. Under this argument, limiting the risk of fiscal dominance should be achieved through means other than prohibiting the central bank from lending to the government.

Regarding the choice of public or private sector, being prohibited from lending to the government does not necessarily mean that the central bank must invest abroad. The

central bank could invest in domestic private sector assets. However, doing so may not always be possible in countries where the range of private sector assets is narrow – in those circumstances, domestic lending would raise concerns about credit risk and liquidity risk. It would also potentially bias funding costs in favour of some market participants and against others. In the exceptional circumstances represented by the current international financial crisis, the central bank's acquisition of private assets can become large enough to raise such issues even in the largest advanced economies, such as the United States. Where capital markets are not deep, or are not functioning well, the central bank could become a significant financier of individual enterprises, biases in funding costs of individual private enterprises could be important, alongside notable governance issues and (in some places) corruption risks. In any case, central bank investment in marketable government securities can help maintain its neutrality towards private borrowers and in smaller economies can potentially assist the development of the government securities market.

2.1.3 *Exchange rate risk preferences*

The choice to invest the proceeds of monetary liabilities in foreign assets usually creates an exchange rate risk. A very small number of countries have the option of investing in foreign assets denominated in their own currency. But for the large majority, holding foreign assets means holding foreign currency assets.

Foreign currency assets are on central bank balance sheets often as a result of historical or current policy reasons rather than as a result of a decision on balance sheet structure. One historical reason is that fixed exchange rate regimes required stocks of foreign currency. Among the current reasons to maintain a reserve of foreign currency instruments are the ability they convey to intervene in foreign exchange markets to influence the exchange rate and the ability to deal with an interruption in access to global capital markets. As both those motivations tend to be more relevant to emerging than advanced economies, emerging markets tend to maintain higher proportional levels of foreign currency reserves. An active exchange rate policy creates variations in foreign currency positions that in turn generate changes in exchange rate exposures. However, the structural position associated with maintaining an intervention capability need not necessarily create an exchange rate exposure for the central bank.

There are two main ways for the central bank to avoid a structural exchange rate exposure while maintaining an intervention capability, and both have balance sheet consequences. The first way is for the government, rather than the central bank, to own the foreign exchange reserves used for intervention. Under such arrangements – for example, in Canada, Japan and the United Kingdom – the central bank intervenes as an agent without carrying any of the balance sheet risk. Some central banks do not have this option, as the relevant law requires that the central bank holds and manages the reserves. This is the case, for example, for the Eurosystem central banks.¹⁰³

The second way to avoid a structural exchange rate exposure is for the foreign exchange reserves to be funded from foreign currency borrowings rather than domestic monetary liabilities. Such an arrangement is generally available to borrowers with a high credit standing – the Bank of England is a notable example – and leads to an increase in the size of the central bank's balance sheet, since foreign currency

¹⁰³ Article 105, paragraph 2, 3rd indent of the EU Treaty makes it a task of Eurosystem central banks to hold and manage the official foreign reserves of Member States.

liabilities cannot be a general substitute for domestic monetary liabilities.¹⁰⁴ Until recently the Reserve Bank of New Zealand ran a fully hedged foreign exchange position. However in 2007 the Reserve Bank restructured its balance sheet to one that incorporates a sizeable “long” foreign exchange position. This followed a fundamental review of the structure of the balance sheet, taking account of its various policy roles and responsibilities. The revised structure was also considered to provide the Reserve Bank with greater scope to intervene in the foreign exchange market for monetary policy purposes (ie if possible to avoid unnecessary instability in the exchange rate while achieving its inflation target over the medium term). High-level trade-offs between different policy and financial objectives clearly were involved in arriving at the preferred asset and liability structure (see Reserve Bank of New Zealand (2007a,b)).

2.1.4 *Balance sheet variance*

The recent restructuring of the Reserve Bank of New Zealand’s balance sheet illustrates some considerations relating to the impact of different financial structures on the co-variance of the central bank’s net asset and liability position with economic circumstances facing the country as a whole. The review that led to the restructuring in New Zealand appears to have been viewed from “mini-max” welfare and insurance perspectives. Setting aside the financial consequences of any foreign exchange market intervention – or assuming no intervention – a long foreign exchange position would generate profits during a financial crisis or a period of weak economic performance that leads to depreciation of the local currency; that is, foreign currency assets would be increasing in value in local currency terms. Conversely, a long foreign currency position would lead to losses during good times as the local currency appreciated. Thus, from an overall public sector or national net worth point of view, some offsetting of gains and losses would be involved, consistent with a portfolio diversification strategy.¹⁰⁵ If such diversification gains are thought to be important, it may even be judged appropriate to pay a higher running cost of financing reserves by borrowing in the domestic currency, which is akin to paying an insurance premium.

Even if motivated by wider public sector or national net worth considerations, the impact on the central bank’s own position cannot be ignored. By design, policy and financial independence separate the governance of the central bank from the governance of the public sector as a whole. From the mini-max perspective, a long foreign exchange position would mean that the central bank is booking revaluation gains when the policy situation is worst – when the currency is tumbling, such as may be the case during an economic crisis. Although intervention in the foreign exchange market in such circumstances might risk losses, the central bank’s own starting position would be one of relative strength. But on the other side of the coin, in better times the central bank’s capital position would be eroded by exchange rate revaluation losses. Should such losses accumulate to the point at which recapitalisation of the central bank is warranted, financial independence may be threatened. While a capital injection by the government may be more forthcoming because tax revenues are relatively

¹⁰⁴ A third possibility would be to achieve the same exchange rate hedge through derivatives. For the purposes of this discussion, this option can be regarded as equivalent to financing FX reserves with foreign currency borrowing.

¹⁰⁵ Another way of viewing such a central bank position is as a “hedge” against the exchange rate risk faced by the economy as a whole; or sometimes, more specifically, as a hedge against an opposite exchange rate exposure embedded in the government’s balance sheet. Some countries have also accumulated foreign exchange assets in their sovereign wealth funds, which moves the foreign currency exposure from the central bank’s balance sheet and may also facilitate investing in a wider range of investments, including equities, than is typical for a central bank.

buoyant, new funds may not be automatically granted. Potentially difficult negotiations may be required; the central bank may find it difficult to persuade the sceptical elected officials that the loss of capital was justified, especially if, at the same time, the central bank is raising interest rates to cool the buoyant economy. For this type of reason, diversification tends to be only an ancillary consideration.

A further ancillary consideration is the dynamics of risk-taking during foreign exchange interventions. A central bank that maintains a structural net long foreign currency exposure would reduce its initial currency mismatch when intervening to support a falling currency. Conversely, faced with the same policy problem, a central bank with a fully hedged structural starting point (FX assets fully funded by FX liabilities) would, by intervening, generate a currency mismatch at a time when the situation was most risky. Such dynamic issues are rarely discussed in connection with choices on balance sheet structure, suggesting that they are of second or third order.

2.2 Policy regime influences on the balance sheet

2.2.1 Exchange rate regime

First, maintaining foreign exchange reserves provides a capability to intervene, including in financial crises to ensure continued convertibility of the currency, and in circumstances in which access to capital markets dries up. This appears to have been one of the driving forces behind the accumulation of substantial foreign exchange reserve portfolios by a number of East Asian central banks in the aftermath of the Asian financial crisis of the late 1990s. Even among those countries whose central bank holds only very small amounts of foreign currency reserves – for example, Canada, the United Kingdom and the United States – the government continues to hold foreign exchange reserves (generally with the central bank continuing to manage some or all of the portfolio under an agency arrangement). Because countries with a floating exchange rate tend to intervene in the foreign exchange market infrequently, their holdings of foreign exchange reserves tend to be reasonably stable.¹⁰⁶

Intervention in the foreign exchange market to maintain a fixed or managed exchange rate or to influence a floating rate produces fluctuations in holdings of reserves. When reserves are held on the central bank balance sheet, both sides of the balance sheet are affected. On the liability side, the local currency leg of the intervention transaction initially affects commercial banks' deposit accounts at the central bank.¹⁰⁷ Usually, that initial effect is immediately sterilised to prevent changes in liquidity that would be inconsistent with policy interests. Generally, sterilisation operations involve the central bank in offsetting its purchase (sale) of foreign exchange by selling (buying) government securities from its own portfolio. With large-scale purchases of foreign exchange, central banks may find that they hold insufficient securities in portfolio, and instead have to issue their own securities (for example, the People's Bank of China). Central banks can also issue their own securities to widen the range of monetary control options.

¹⁰⁶ Which is not to say that the *composition* of the foreign exchange reserves portfolio is not actively managed; many central banks quite actively manage the portfolio with a view to achieving investment performance targets, within prescribed risk parameters.

¹⁰⁷ Either directly to the account of the local banks with which the central bank has entered into the foreign exchange transactions, or indirectly when transactions with local banks' customers (including their overseas correspondents, and customers of those correspondents) are cleared and settled across the accounts of the central bank.

Thus foreign exchange market interventions can produce large-scale changes in the size and composition of the central bank balance sheet. Where sterilisation is entirely in securities held in portfolio, the changes are compositional, with foreign exchange assets rising or falling and domestic assets moving in the opposite direction. When the central bank issues its own securities as a part of the sterilisation operation, the balance sheet also swells (or shrinks, where upward pressure is being exerted on the exchange rate).

2.2.2 *Fiscal influences*

In virtually all countries, the government holds its main bank account with the central bank. However the range of banking services varies widely. Some central banks (for example, the Bank of Canada) provide little more than a single cash deposit account; in such cases, transactional banking services, such as the processing of government payments, are provided by commercial banks, whereas other central banks (for example, the Reserve Bank of Australia) provide both account and transactional services. In both cases, however, the Government's bank account at the central bank generally is the main repository for its cash flows arising from revenues, expenditures and financing transactions. Thus, the Government's cash payments and receipts generally result in a transfer of funds (in the interbank clearing and settlement system) between the Government's account and the commercial banks' accounts at the central bank. In this way, fiscal policy as it eventuates in government financing operations can have a significant bearing on the structure of the central bank's balance sheet.

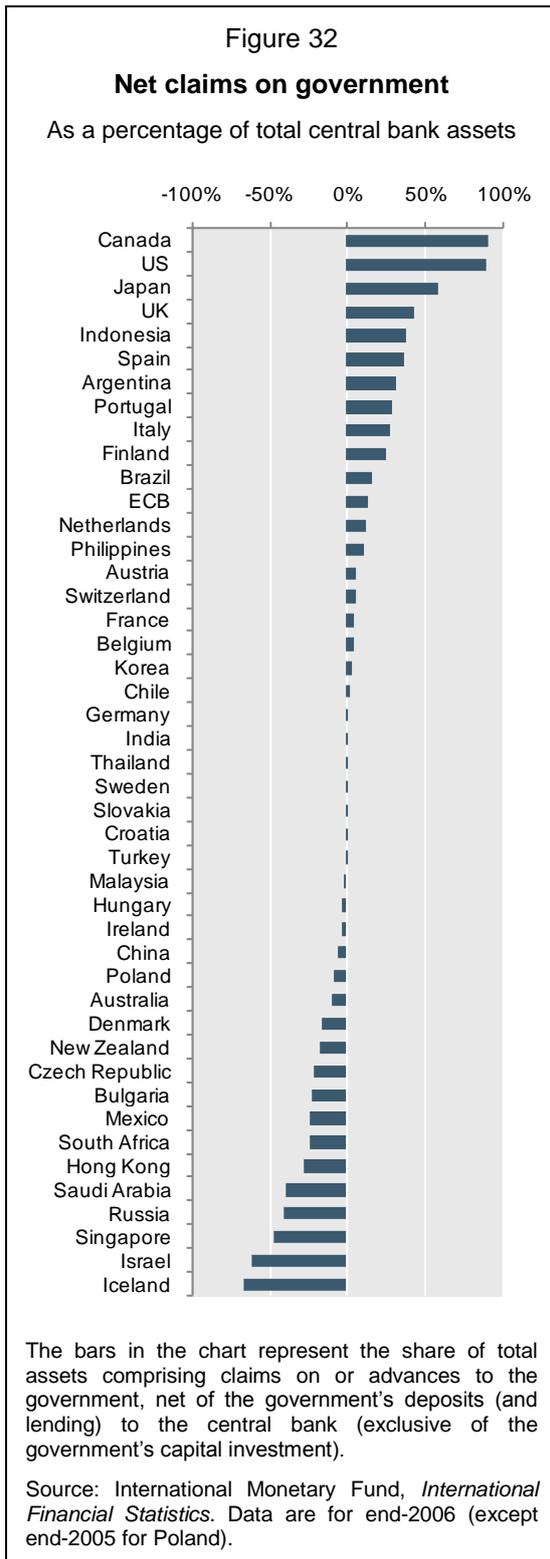
As evident from the preceding discussion, central banks' choices for structuring their balance sheets – for example, regarding sterilisation of interventions in the foreign exchange market – can also have a bearing on the financial position of the central bank vis-à-vis the government. The overall government position with the central bank reflects both influences and also varies substantially across central banks in the Central Bank Governance Network (Figure 32).¹⁰⁸ Some central bank balance sheets, including those of the Bank of Canada and the Federal Reserve System, show large net claims on their respective Governments, whereas in other cases, for example, Iceland and Israel, central banks are large recipients of deposits from their Governments.

2.2.3 *Monetary operations*

The central bank's liquidity management operations can have a significant bearing on the structure of its balance sheet. While central banks generally implement monetary policy by calibrating the price (interest rate) at which they transact with the commercial banks and the amounts in which they transact, the details vary from central bank to central bank.

Such operations may take a variety of forms. For example, excess liquidity in the banking system might be absorbed by the central bank through a sale of securities; issuing its own interest bearing securities; entering into repurchase agreements (under which the central bank sells government bonds with an obligation to repurchase at an agreed price at a future date, and which, under accounting conventions, is treated as secured borrowing); and entering into foreign exchange swap agreements (similar in substance to repurchase agreements, but using foreign exchange rather than government bonds to exchange payments or rates over a specified period).

¹⁰⁸ This overall position comprises central banks' claims on the government (by way of advances and holdings of government bonds) less their liabilities to the government (deposits held by the government with the central bank and any other borrowing by the central bank from the government, but not the government's equity in the central bank).



Alternatively, excess commercial bank deposits at the central bank might be “absorbed” by an increase in reserve requirements, possibly with little change being evident in the balance sheet. However, although there are exceptions (China being an important one), the trend has been away from the use of reserve requirements as a policy instrument, and in many countries there are none.

While these different operating techniques affect the balance sheet in quite different ways, they have the same broad monetary effect. In other words, there is no one-to-one relationship between the size and structure of a central bank's balance sheet and its effectiveness as a monetary policy institution. Any such evaluation needs to take account of the nature of the central bank's monetary operations and how they are reflected in its balance sheet.

2.2.4 Financial stability interventions

The balance sheets of some central banks include claims on the private sector and on non-bank financial institutions, such as development banks. Claims on the private sector generally arise from the central bank's provision of emergency support to the financial system; while not common, such interventions and their impact on the balance sheet are related to core parts of central bank functions. Claims on non-bank financial institutions typically arise from the provision of finance for longer-term development purposes; such financing is neither common nor generally regarded as a core part of central bank functions.

Private assets normally appear on the balance sheets of only a small number of central banks (Figure 30). This is in part because large-scale liquidity support operations are rare and temporary. Such support more usually involves either the government, directly, or a special purpose asset resolution entity. And it is usually

considered preferable to prevent the extension of the central bank's banking (credit) functions to the non-bank private sector (the financing of which is the function of the commercial banking system).

However, the current financial crisis, centred in major industrial economies, illustrates that financial stability interventions can in certain circumstances dramatically alter the size and structure of central bank balance sheets. For example, Figure 30 shows that

the balance sheet of the Federal Reserve System was almost entirely invested in US government securities at the end of 2006, yet by the end of 2008 it was predominantly invested in private sector debt. And during the intervening period, the size of the Federal Reserve's balance sheet had more than doubled. During the same period, the balance sheet of the Bank of England, and to a lesser extent that of the ECB, were similarly transformed (Figure 33).

These changes in balance sheet composition and size have directly and indirectly affected the financial relationship between these central banks and their governments – in terms of the risk characteristics of the government's equity stake in the central bank and the central bank's exposure to recapitalisation risk. In turn, these changes can, but need not, influence the financial independence of these central banks.

In sum, the composition of central banks' asset portfolios covers a full spectrum, from those that are almost entirely local currency backed – for example, the Bank of Canada – through a range of intermediate positions, to some that are overwhelmingly foreign currency backed – as is the case for those, such as the HKMA, that operate a currency board type of arrangement.¹⁰⁹ Most of the advanced economy “gold standard legacy” central banks still have sizeable foreign currency holdings. Meanwhile, central banks in a number of emerging market economies – for example, China, Hong Kong SAR and Malaysia – have accumulated very substantial foreign exchange reserves, particularly during the last seven to eight years following the East Asian financial crisis; they have done so both for precautionary reasons and to manage their exchange rates in the face of large balance of payments surpluses. And central banks in a few large developed economies have recently seen dramatic changes in the structural composition of their balance sheets, the longer-term effects of which are yet to be seen.

3. Central bank income

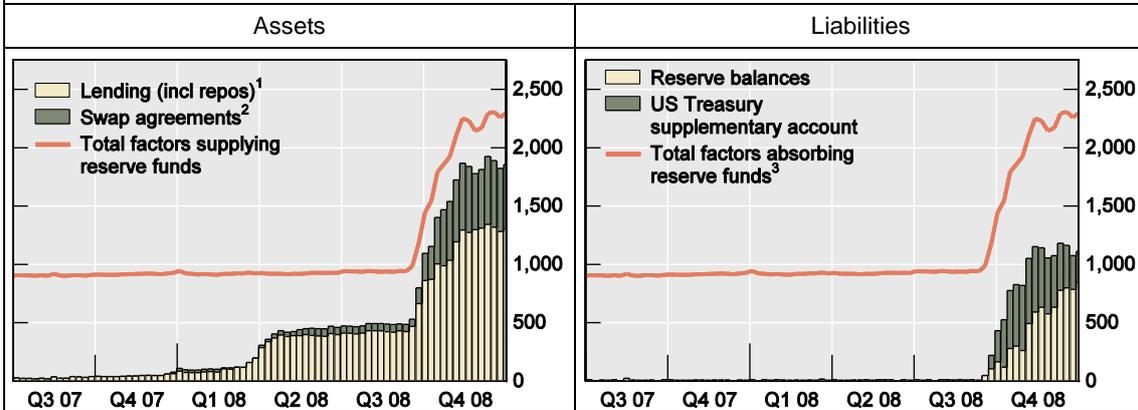
A central bank's income statement resembles that of any other financial institution. Its primary source of income is interest receipts from investments, net of interest costs from liabilities, although revaluation gains and losses can also matter substantially. As discussed above, the liability and asset structure reflects the variety of policy approaches and circumstances in each country. In turn, these choices and circumstances will affect income generation. Although it sometimes seems that central banks are inherently in a position to generate more income than they could possibly spend – on valuable projects, that is – structurally unprofitable outcomes are also possible.

¹⁰⁹ Use of foreign exchange derivatives can cause the foreign exchange position of a central bank to be quite different from what is shown on its balance sheet. For example, some central banks use foreign exchange swaps to manage liquidity: one side of these transactions is on-balance sheet and the other is off-balance sheet.

Figure 33

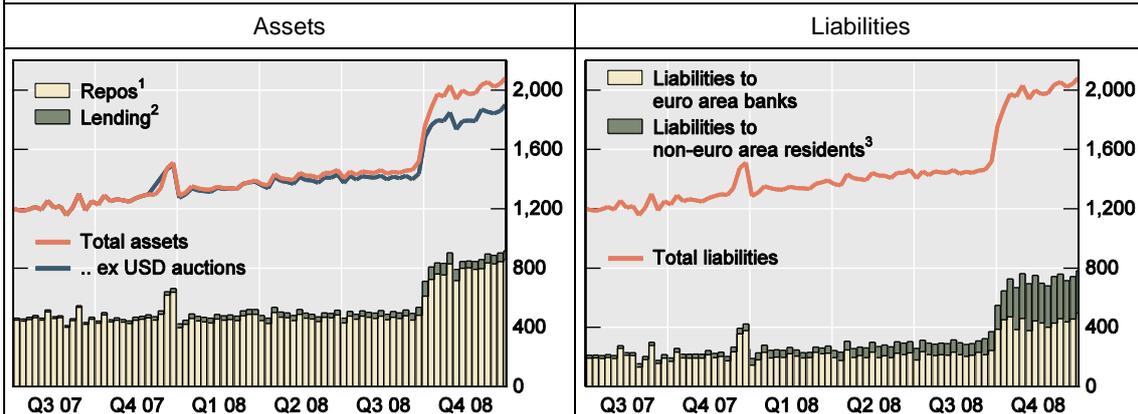
The recent evolution of selected central bank balance sheets

Federal Reserve (in billions of US dollars)



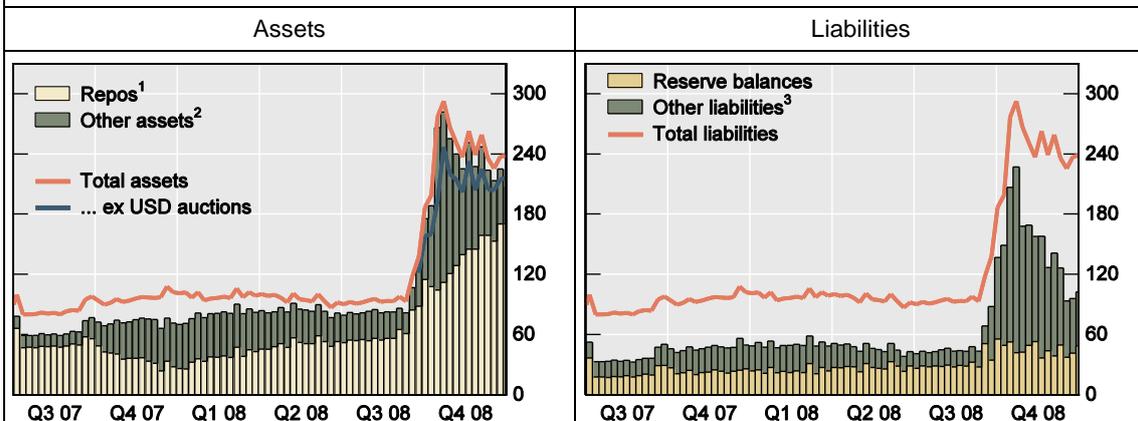
¹ Primary credit, reverse repos, Term Auction Facility and all other special lending facilities introduced since December 2007. ² US dollar currency swap agreements with foreign central banks. ³ Total factors absorbing reserve funds and reserve balances with Federal Reserve Banks.

Eurosystem (in billions of euros)



¹ Main refinancing, long-term refinancing and fine-tuning operations in euros. ² Marginal lending and other claims in euros on euro area credit institutions. ³ Including liabilities vis-à-vis the Federal Reserve (US dollar currency swap agreements).

Bank of England (in billions of pounds sterling)



¹ Reverse sterling repos. ² Includes, among others, lending for UK deposit protection and US dollar repo lending to UK-based credit institutions. ³ Including fine-tuning sterling repos.

Source: Central banks.

3.1 *Net interest income*

3.1.1 *Balance sheet composition effects*

Where the share of non-interest bearing liabilities is overwhelming, the portfolio of assets of the central bank will usually generate ample seigniorage income. In those cases, the central bank can face little in the way of a budget constraint to promote efficient, and effective, use of resources – an issue that is returned to in Section 6.1 below. Also, it can give rise to struggles over whether the central bank should retain the surplus to build up reserves or transfer it to the government (considered further in Section 5.3 below). A further concern is that because surplus income tends to rise with inflation via nominal interest rates, either the government or the central bank, or both, have an incentive to inflate.

But the central bank's funding position may be precarious – especially where foreign exchange reserves are large and growing, or the central bank accepts unusually low interest margins as a result of operations to absorb liquidity or restore financial stability. For most central banks, the investment returns on foreign (reserve) currency assets are lower than those available on the domestic currency assets for which they are a substitute. Equivalently, the cost of additional domestic funding required (such as where a central bank issues securities to the market to sterilise the expansionary monetary effect of purchasing foreign exchange) is often higher than investment returns on the foreign exchange assets purchased. Lower interest rates on reserve currencies tend to go with the greater liquidity and lower risk premia typically associated with those currencies.¹¹⁰

For example, in recent years, Bank Indonesia has earned between 2.5% and 3% on its foreign exchange reserve holdings but has paid between 7% and 8% on rupiah securities it has issued to finance them. In China, where for some years the sterilisation costs were negative – local interest rates were below the rates obtainable on foreign currency investments – a normalisation of international interest rate differentials has recently created a negative “carrying cost” on the foreign currency reserves.

The financial risks arising from policy decisions are a motivation for some central banks to hold exceptionally large buffers of capital. Moreover, capital invested in the central bank does not necessarily carry a market related servicing cost.

3.1.2 *The level of interest rates*¹¹¹

A core influence on central bank income is the level of domestic interest rates. With a substantial proportion of funding (currency liabilities on issue) at a zero rate of interest, variations in the interest earned on a central bank's investment assets (both domestic and foreign) translate directly into variation in its net investment income.

For most central banks, the amount of currency issued, the counterpart of which is invested at prevailing rates of interest, generates net interest income sufficient to comfortably cover their operating expenses. In a restricted BIS study on central bank

¹¹⁰ Even where the central bank funds the building of foreign exchange reserve assets in foreign currency, there can still be a net interest cost. Unless the central bank enjoys a foreign currency credit rating that matches or exceeds that for the foreign currency assets in which it invests, the cost of borrowing generally will be greater than the investment return.

¹¹¹ The concentration in this section is on the effect on income of sustained interest rate configurations, rather than on policy measures undertaken to influence the business cycle and thus the current level of interest rates.

capital (BIS (2005a)), the break-even interest rate – that is the level of interest rate required for net investment income to be just sufficient to cover operating costs – was estimated for a cross section of central banks to fall mostly in a range from about 0.5% to a little over 1%, or around double those levels if the amount of currency issued was to shrink by half (Table 15).¹¹² These estimates suggest that interest rates at “normal” levels, combined with current patterns of currency use, provide most central banks with a comfortable level of net investment income relative to their operating expenses.

Table 15
Break-even interest rates for central banks
In per cent

	Actual date (2003)	If banknotes issued fell by 50%
Canada	0.50	1.01
Chile	4.94	-6.74
Czech Republic	1.00	2.92
France	2.45	4.82
Japan	0.17	0.33
Netherlands	0.85	1.50
Philippines	1.17	1.89
Sweden	0.53	0.79

Source: BIS (2005a).

That said, the same study also highlights how the break-even interest rate can be sensitive to the structure of the balance sheet. In cases where only a small proportion of the central bank’s total funding is interest free, say because of past losses that have eliminated capital, a reduction in currency issued could actually tip the central bank into a loss-making position. The Central Bank of Chile is a case in point: owing to losses that were incurred through the 1990s, it has since had negative capital, and its income earning assets exceed its interest bearing liabilities by only a small margin. In that case, a (hypothetical) 50% reduction in the amount of currency issued would shift the balance sheet of the central bank from having net remunerated assets to net interest bearing liabilities and thus create structural losses.¹¹³

Also, interest rates may fall to such low levels that central bank net investment income falls to correspondingly low levels. In the early part of this decade, interest rates in the United States and in the euro area were at very low levels, which, if sustained, could have significantly narrowed the comfort margins of the central banks of those

¹¹² The break-even interest rate is calculated as a weighted average of domestic and foreign interest rates but does not take account of potential currency gains or losses on net foreign exchange positions. The calculations are sensitive to a number of assumptions and hence should be regarded as illustrative rather than definitive.

¹¹³ A negative break-even interest rate should be understood in terms of the central bank needing to receive an interest subsidy sufficient to cover what would be a net interest expense.

economies (although they would not have faced any immediate danger of losses). Interest rates have again fallen to very low levels.

3.2 *Income from balance sheet operations*¹¹⁴

Many central banks nowadays implement monetary policy by undertaking operations in the financial markets and place less reliance on administrative measures, such as adjustments to reserve requirements and regulations on commercial lending. These operations generally are calibrated to achieve a targeted short-term interest rate (the central bank's "policy" rate) in the financial markets. Given fluctuating market conditions, central banks typically have a regular presence in the market, either buying (to inject liquidity) or selling (to withdraw liquidity).¹¹⁵ If these operations are conducted at a positive "spread" between the price at which the central bank provides central bank liquidity and the price at which it withdraws it – around a reasonably stable policy interest rate – income is generated for the central bank. Conducting market operations at a spread can also encourage market participants to manage liquidity by transacting within the spread among themselves and thus support the operation of domestic cash and bond markets; however, excessive spreads can amount to a "tax" on the financial system and inhibit its development. For these reasons, the design of the central bank's market operations is policy driven rather than profit driven.

3.3 *Fees for services*

Most central banks perform a range of activities beyond those that involve the use of its balance sheet to implement monetary and exchange rate policy. Almost all act as banker to, and some are supervisor of, the country's commercial banks. Many also provide banking and debt management services to the government. In many countries, central banks also have been providers or regulators of the systems by which payments are cleared and settled among commercial banks.

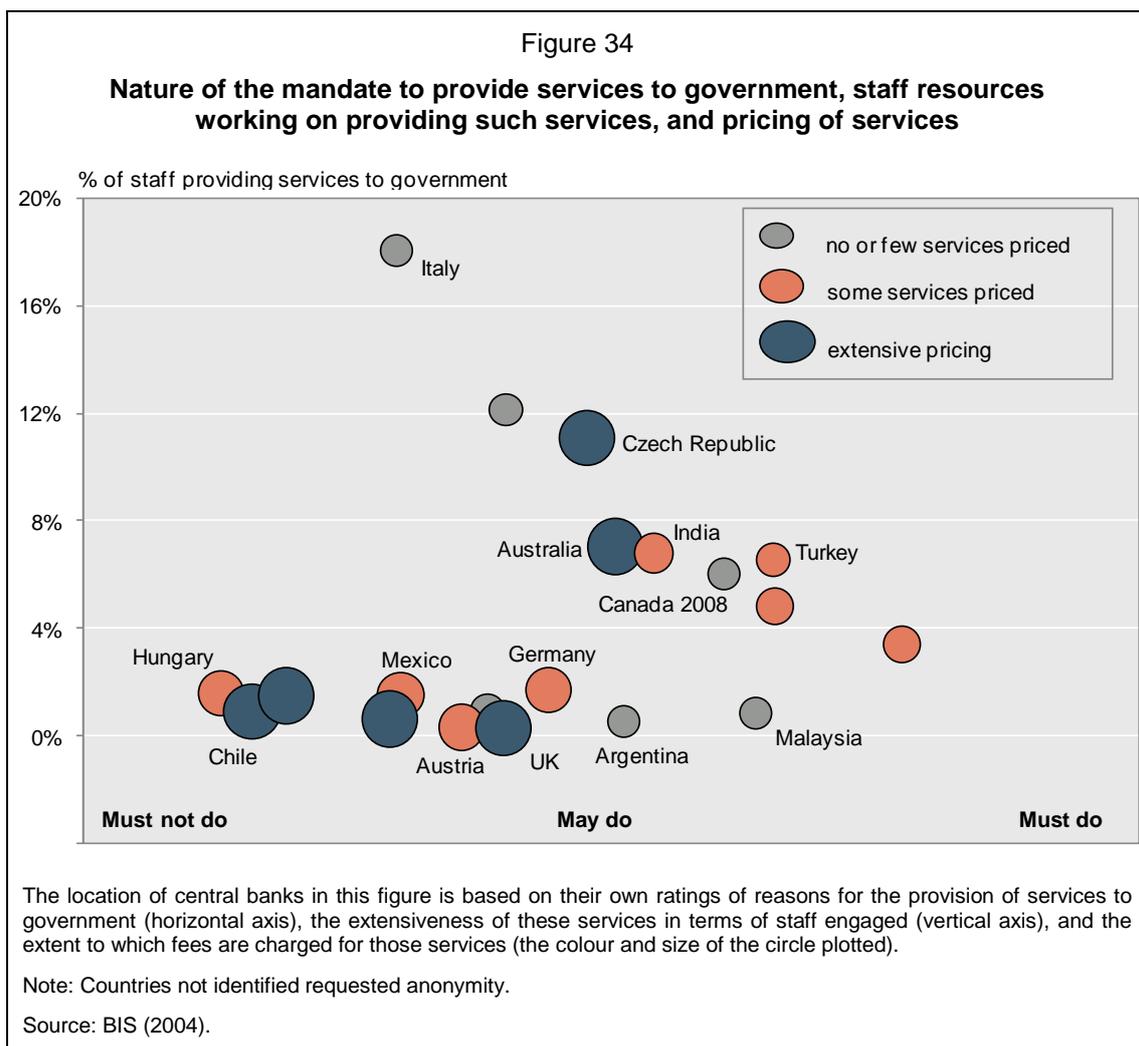
In some countries, it is also common for central banks, as agent for the government, to perform a range of administrative functions related to the financial sector that are not necessarily core central banking functions (Figure 34). In the United States, for example, the Federal Reserve Banks process food coupons and postal money orders (and are reimbursed for the costs of providing these and similar services). The Bank of France administers the Household Debt Commission, which provides personal budgeting assistance, and employs throughout France approximately 1,200 of the Bank's 15,000 staff.

Some central banks have quite rigorous and comprehensive processes for charging fees for services provided, for example, Australia and the United States (Figure 35). In

¹¹⁴ As a matter of practice, it is not always easy to account separately for the income from holding securities and the income from trading them because both involve the same portfolio (unlike commercial banks, which often separate their balance sheet into a trading book and a banking book). A similar issue arises from the liability side of the balance sheet. Hence, net investment income as reported in central banks' financial statements generally comprises a single amount, which means that the cost of funding the portfolio can mask the income from operations.

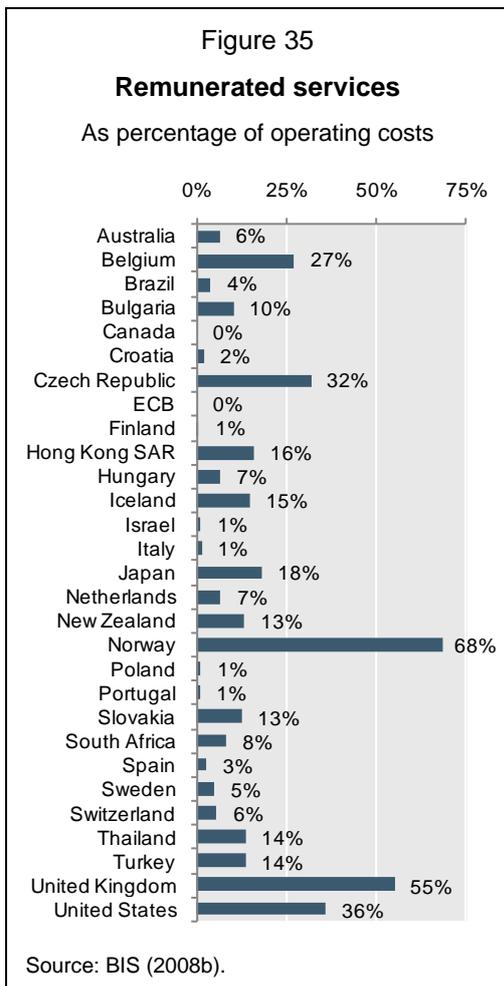
¹¹⁵ Most central banks undertake open market operations in one form or another, although the techniques used differ in their detail from one central bank to another. They may involve buying and selling securities outright, the use of repurchase agreements (in economic terms, secured loans), making loans and taking deposits, foreign exchange swap transactions, or some combination of these. See Bank of England (2006 and 2008) for a review of market operation practices in the United Kingdom and BIS (2008a) for an updated summary of market operations practices in large economy central banks.

Australia, since 1996 contracts by government agencies have been required to go to public tender and entities like the Reserve Bank of Australia price their services to the Government at full cost, including a return on capital. The Federal Reserve is required to practise full cost recovery for a range of payment services it provides to depository institutions (including a margin for imputed profits and taxes); which means, in effect, to charge on a basis that is competitively neutral with respect to private sector providers. As a result, the Federal Reserve System recovers almost one third of its operating costs by pricing services. Central banks that have implemented charging regimes for the provision of services generally have found it to have sharpened their focus on efficiency and on whether alternative arrangements might be preferable, from the standpoint of both the central bank and the service recipient.



By contrast, there are some central banks that do not charge for services. Some of these central banks find it difficult to set fees to cover overhead as well as the direct costs of providing the services concerned. Another constraint on charging fees for services provided can be the law. For example, by law the Deutsche Bundesbank cannot charge for services provided to the Government. That said, it is not unusual for central banks to provide services to the government without charge; this is the case for fully one half of emerging market central banks and one third of industrialised economy central banks. One possible rationale for this practice is that charging would introduce unnecessary administrative costs since the amounts involved merely gross up both

government expenditure and receipts, and that these would be netted out if the government and central bank accounts were consolidated.



Overall, fee income has not been a major contributor to central bank income, and in the cases of some central banks, ancillary functions tend to be funded to a significant extent out of the income generated from the balance sheet. For instance, the incidence of bank supervision fees is significantly less in countries where the bank supervisor is the central bank rather than a separate supervisory agency, although the non-interest bearing reserve deposit requirements that apply to commercial banks in some countries can be regarded as a proxy for fees. Also, there are some central banks that apply reasonably full cost recovery for banking supervision, eg the Bank of Slovenia, or partial cost recovery as the Central Bank & Financial Services Authority of Ireland, the Netherlands Bank and the Bangko Sentral ng Pilipinas (Masciandaro et al (2007)).

4. Balance sheet exposures: asset and liability revaluations

The preceding sections of this chapter have described the central bank's financial resources and the sources of income. This section considers how the balance sheet can be exposed to revaluations which, when they crystallise, can have a substantial impact on

the income and capital of a central bank, and thus on the availability of the resources needed for it to perform its functions.

The central bank's exposure to operational risks (fraud, computer failure during a crisis, policy errors) is considered separately in Chapter 8.

Central banks have dual responsibilities in relation to their balance sheet – as a policy institution and as a custodian of public resources. These responsibilities are mostly complementary, but in some circumstances they can conflict.

For a central bank to achieve its policy objective of maintaining price stability – that is, stability in the purchasing power of the central bank's monetary liabilities – it needs to maintain sound asset backing for those liabilities: sound money generally requires a sound balance sheet. But a central bank may also need to use its balance sheet to help maintain stability in the face of financial shocks. For example, it may need to provide emergency liquidity assistance in the event of a financial shock that causes a "flight to cash". The example of dramatic changes in the structure of the Federal Reserve System's balance sheet in response to the worldwide financial crisis has already been noted.

And, as discussed above, most central banks hold net foreign exchange reserves, and hence an exposure to exchange rate risk, to support policy objectives.

Thus, for central banks, minimising financial exposure cannot take precedence over the key policy goals of maintaining price and financial stability. At the same time, however, effective stewardship of the balance sheet is important: poor financial performance by a central bank can impinge, potentially seriously, on the adequacy of its resources and on its ability to deliver medium-term price stability; and ultimately its financial results are for the account of the public purse. Stewardship of the central bank's finances entails effective management of the structural exposures as well as of day-to-day activities (asset and liability management and revaluations), as discussed below.

4.1 Balance sheet exposures

Central banks' financial risk exposures can be grouped into three broad categories: exchange rate, interest rate and credit.

4.1.1 Exchange rate exposure

The majority of central banks maintain a structural "long" foreign exchange exposure (Figure 30). The long foreign exchange position can be viewed as (1) allowing the central bank to back its own liabilities with other currencies and (2) enabling the central bank to support – that is, buy – its own currency in the foreign exchange market if that is needed.

Losses or gains from foreign exchange exposure depend on changes in the exchange rate, net of interest rate differentials on assets and liabilities. Provided the exchange rate remains fixed (Hong Kong SAR) or fluctuates around a reasonably stable long run average value (eg Australia over recent decades), these exposures either do not result in significant gains or losses, or they produce gains and losses that may be offsetting over the longer run.

But long-lasting currency adjustments have correspondingly more permanent implications. For example, a central bank may accumulate foreign exchange reserves to counter upward pressure on the exchange rate; such pressure can arise from, say, trend improvements in an economy's productivity and performance, as arguably has been the case for China, Korea and some other emerging market economies in recent years. The accumulation may grow to the point at which the inflationary and/or interest carry costs tip the balance in favour of allowing the exchange rate to appreciate.¹¹⁶ That, of course, would crystallise the exchange rate exposure and result in a one-time, but possibly substantial, revaluation loss for the central bank. A number of emerging market economies have incurred significant losses as a result of interest carry and exchange rate adjustments during the past decade or so, including the Central Bank of Brazil, the Czech National Bank, the Central Bank of Chile and Magyar Nemzeti Bank.¹¹⁷ A central bank can also incur losses when it sells foreign exchange, thus accumulating a short foreign exchange position, in an unsuccessful attempt to defend its exchange rate from depreciation. Examples include the United Kingdom in September 1992, when it was forced to abandon its participation in the European Exchange Rate Mechanism; and the Bank of Thailand in 1997, when it endeavoured to support the baht during the East Asian financial crisis

¹¹⁶ Monetary theory suggests that in these circumstances, even if the nominal exchange rate does not rise, the *real* exchange rate will do so because the foreign exchange purchases entail a monetary expansion that generates inflation.

¹¹⁷ See Dalton and Dziobek (2005) for a brief description and discussion of the experience of those countries.

Exchange market intervention can, of course, be profitable. If the central bank's view on the appropriate value for the currency turns out to prevail, then taking and holding an exposure consistent with that view results in a gain to the central bank. Over the years, many central banks, including those in the major economies, have intervened in the exchange market in a manner sometimes referred to as "leaning against the wind". The Reserve Bank of Australia has intervened in the exchange market over a number of years with a view to smoothing fluctuations in the value of the Australian dollar; it reports that this intervention policy has been profitable on average (Reserve Bank of Australia (2003)). Opportunistic intervention can also be profitable if the central bank's view of the evolution of the exchange rate proves to be right.

4.1.2 *Interest rate exposure*

Central banks' asset portfolios comprise mostly fixed income investments, whether in local currency or foreign currency. Investing for longer terms, given the normally upward sloping yield curve, usually provides a higher and more stable return than investing in short-term assets. But it also creates an interest rate exposure (ie gains or losses should long-term interest rates change). Unless funded by liabilities with an equivalent interest rate structure – which central banks' currency liabilities do not have because they bear no interest – these gains or losses affect the economic value of the central bank's balance sheet. The overall gain or loss in any accounting period from investing in long-term fixed interest assets, therefore, may be more volatile than if the central bank had invested in investments on which the interest rate re-sets more frequently (ie the greater stability in net interest revenue flow is more than offset by revaluations of the investment assets).

4.1.3 *Credit exposure*

Holding financial assets always involves a credit risk. Typically those risks for central banks are low, with counterparties generally confined to those of high credit standing. Moreover, exposures arising from domestic market operations are generally covered by high quality collateral – typically government bonds or other highly rated securities in (reverse) repurchase agreement transactions.¹¹⁸ And in relation to foreign exchange reserves management, credit quality considerations are given a far higher weighting than is consistent with the financial impact of a credit event – reputational costs matter a lot.¹¹⁹

However, being lender of last resort for the country's financial system is also a core central banking function, as discussed in Chapter 2. This function entails standing ready to provide (undoubted) central bank money in exchange for (in principle, collateralised) claims against solvent financial institutions that are nonetheless unable to liquefy their assets or borrow anew to meet demands for repayment. The role embeds a potentially substantial contingent exposure in central banks' balance sheets (Stella (1997)). Lending only against good collateral should not, in principle, expose the central bank to elevated credit risk; but in several instances, it has in fact done so – Chile, Nicaragua and Venezuela in the 1980s; Indonesia in the latter part of the 1990s; and Turkey in the early 2000s. Invariably it is difficult to assess whether a financial institution that has lost the confidence of the market is solvent and hence whether the collateral available is sufficient to mitigate the risk. Moreover, the value of collateral as insurance against the default of an issuer lies in the ability of the lender to sell the

¹¹⁸ See BIS (2008a) for details of the securities accepted as collateral under the "standing" credit facilities provided by the central banks of the G10 and selected other large economies.

¹¹⁹ See Borio et al (2008).

collateral immediately. In the context of systemic events, central banks might not be able to do that while also reaching their policy objectives.

The risks inherent in the lender of last resort role may depend in part on whether or not the central bank is also a bank supervisor and on any arrangements for risk-sharing with the government. Some central banks that are not also bank supervisors have established understandings with the government supervisory agency under which the latter would take the lead role in determining solvency (as in Australia) and carry at least some type of “moral” responsibility should credit losses be incurred. In some countries, the central bank sees its lender of last resort role as that of a provider of liquidity against good collateral, with solvency support, if required, being a government function. In the United Kingdom, the Bank of England, the Financial Services Authority and the Treasury have agreed in their MoU that the Chancellor of the Exchequer has ultimate responsibility for authorising exceptional support operations. In the recent case of the facilities granted by the Bank of England to Northern Rock (October 2007), the Bank of England was indemnified by the UK Government.

During the past decade or so, various central banks have sought to bring clearer definition to their lender of last resort role, particularly its limits. For example, the HKMA and the Sveriges Riksbank have published their lender of last resort policy. In the case of the HKMA, a rule-based policy narrows that role.¹²⁰ In the United States, clear procedures were put in place in the 1990s to establish the conditions under which government resources would be available to support a large financial institution.¹²¹ Further consideration of the role of the official sector is reviewed in a recent report by the US Department of the Treasury (2008). Events have, however, already forced numerous and significant changes regarding the manner of the Federal Reserve’s liquidity support and the range of counterparties to which it is daily providing such support.

4.2 Financial asset and liability management

Day-to-day management of a central bank’s balance sheet mostly involves management of the risk inherent in undertaking market operations and foreign exchange reserve portfolio management. In these operations, most central banks follow relatively conservative policies. Because market operations are generally confined to collateralised transactions with highly rated counterparties, the credit and settlement risks, typically managed within continuously monitored limits, tend to be very low. Nonetheless, financial risk is secondary to policy objectives. Central banks cannot, for example, stop dealing with a licensed banking counterparty because of concerns about financial risk without formally initiating supervisory actions (regardless of the agency responsible for supervision).

Within their strategic balance sheet structures, central banks’ investment policies tend also to be conservative. For example, most central banks included in a 2003 BIS

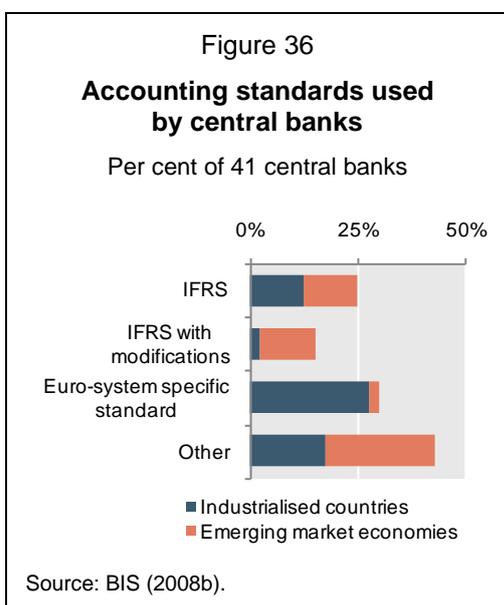
¹²⁰ These policy statements are available, respectively, at http://sc.info.gov.hk/gb/www.info.gov.hk/hkma/eng/guide/circu_date/19990630b2_index.htm and www.riksbank.com/upload/Dokument_riksbank/Kat_publicerat/Artiklar_FS/FinancialStability032_artikel1.pdf.

¹²¹ The Federal Deposit Insurance Corporation Improvement Act of 1991 mandated a least cost resolution approach but also allowed for other action or assistance should a systemic threat emerge. Such action would have to be agreed jointly by the Federal Reserve and the Secretary of the Treasury (in consultation with the President). See also Bradley and Craig (2007) for an overview of more recent legislative changes and propositions.

survey of foreign exchange reserve management reported that liquidity, diversification and risk containment ranked ahead of yield objectives (BIS (2003a)). Within those constraints, however, central banks look for adequate investment returns: Some central banks have developed sophisticated investment management capabilities and actively monitor their investment performance against performance-based benchmarks. In addition, as a “live” benchmarking exercise, the HKMA, the South African Reserve Bank, the Bank of Mexico and the Bank of England have also outsourced a portion of their foreign exchange reserves to institutional fund managers.

The elements of financial risk management are, in broad terms, common across most central banks and, indeed, are similar to those for commercial banks – albeit adjusted for different complexities and specific risks and, crucially, the priority of policy objectives over financial objectives.

4.3 Accounting for balance sheet revaluations



In 2001, the International Accounting Standards, revised to incorporate the best of existing standards (and thus attempting to achieve international uniformity), were renamed International Financial Reporting Standards (IFRS). By March 2008, some 75 countries required their corporate sectors to use IFRS, and many central banks also chose, or were required, to do so. However, some central banks – including a number of major ones – did not do so, at least not in all respects (Figure 36).

A notable feature of IFRS is the requirement for “fair value” accounting, in which assets and liabilities that may be traded before maturity are to be measured at fair (market, if available) value, with revaluation amounts included in income. In contrast, central banks have

traditionally adopted a range of valuation practices, particularly regarding assets:

- at cost (and in cases of some assets, at an arbitrarily low cost);
- on a yield to maturity basis (so that valuation gains or losses are taken to the income statement over the remaining life of the asset);
- at market, with revaluation gains or losses taken to the income statement if realised, but otherwise to a reserve account (subject to unrealised revaluation losses also being taken to the income statement if the balance in the revaluation reserve account is insufficient to cover those losses). A variant of this practice is applied within the Eurosystem and at the Bank of Mexico.

These valuation and accounting practices tend to produce smoother year-to-year income results than does fair value accounting. As discussed above, most central banks have interest and exchange rate positions embedded in their balance sheets. Including changes in the market value of some of those positions can introduce considerable volatility to central bank income, which in turn raises issues for the determination of the amount that will be transferred to the government at year-end. Issues are also raised in terms of the amount of capital needed by the central bank in the discharge of its policy obligations. For example, monetary policy operations when interest rates are already close to zero might involve so-called quantitative easing,

whereby the central bank purchases large volumes of tradeable assets at cyclically high prices. Were such assets revalued at market prices, rather than at yield to maturity (for example), large losses might be booked against capital as interest rates normalised.

5. Capitalising the central bank

At the centre of many discussions on the finances of central banks is the question: what is the appropriate level of capital? The question can arise in a number of contexts: at the establishment of a new central bank; in the event that it incurs large losses which seriously deplete its capital and give rise to a need for a possible replenishment; and if the government seeks a “special dividend” from the central bank to cover a shortfall in its own budget. But the most frequently encountered context is an annual one, when decisions are made on allocating the previous year’s net income.

5.1 *How much capital do central banks need – and have?*

The actual capitalisation of central banks covers a wide range (Figure 37). The variation can be explained, in part, on the basis of wide differences in the nature and extent of the risks – both past and future – faced by different central banks. It can also be explained by a number of other elements, including inherited custom and tradition relating to the financial arrangements between the central bank and the government, and the type of currency regime adopted by the country.

There are important differences – but also similarities – between central banks and commercial banks with respect to the adequate level of capital. Commercial banks need to maintain a clearly positive level of capital so that their owners have an incentive to manage it prudently and depositors remain confident that the bank will always have sufficient assets to pay its obligations, that is, remain solvent. Failure to maintain solvency generally results in the bank being required to cease operating, either because depositors run, or the authorities close the bank.

Central banks, however, are not subject to the solvency constraint because they can pay their obligations by issuing their own liabilities. Thus they are not subject to the same zero bound to capital as that which applies to commercial banks. At the same time, because central banks have a monopoly on the right to issue currency liabilities, their long-term profitability is normally assured.

But that profitability is not always guaranteed. While seigniorage income usually covers a multiple of the central bank’s actual operating expenses, exposures on the balance sheet can result in losses (as discussed in Section 4.1) of a magnitude that results in negative net capital. Does that matter for a central bank? The answer is that it depends. If the losses are of such a magnitude, or persistence, that they cannot reliably be expected to be offset by future seigniorage income, or positive revaluations, then negative debt dynamics can occur. Stella (1997) notes that, in the absence of a real transfer of resources from the government, large central bank losses could either lead to an injection of reserve money – if in cash – or portend future cash injections if the losses are unrealised, and thus could undermine the central bank’s ability to maintain an effective monetary policy. In this connection, Stella (2008) suggests that central banks are exposed to bankruptcy risk, if only in the sense of “policy bankruptcy” – that is, debasement of, rather than default on, its liabilities.

Figure 37

Central bank capital

Per cent of balance sheet assets, end-2007

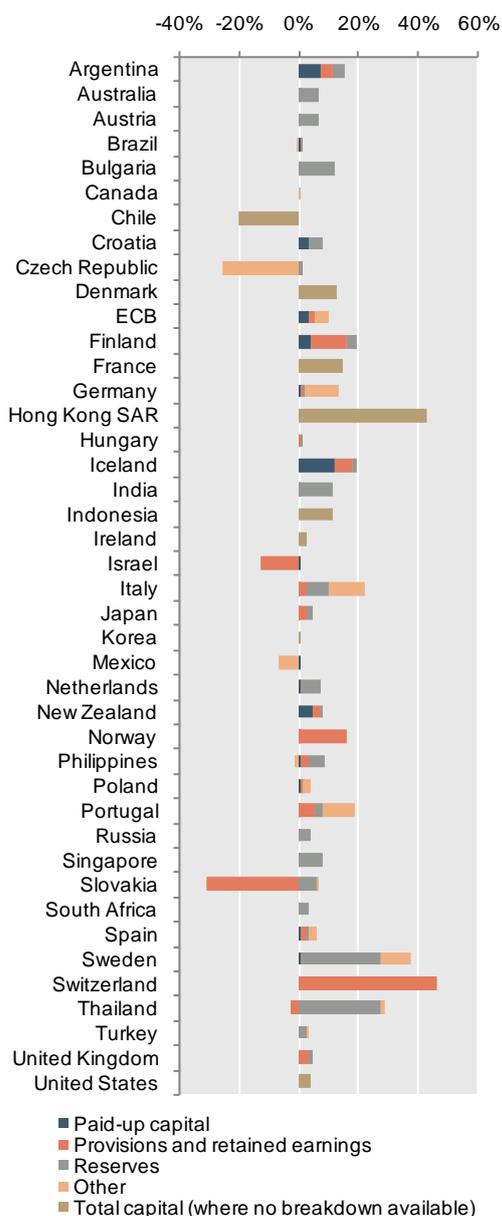


Figure 38 is based on survey responses by central banks and refers to end-2007; by contrast Figure 32 uses IFS data for end-2006.

Source: BIS (2008b).

Thus, negative capital may compromise a central bank's credibility and its financial (and hence policy) independence. It might also result in insufficient balance sheet strength to conduct market operations and hence produce a tendency towards use of (regulatory) instruments that can be inimical to financial development. Moreover, because negative capital can result in negative debt dynamics, a vicious cycle of increasing financial losses and loss of monetary control can ensue. The relevant yardstick is thus functional rather than numerical: central banks need sufficient capital for policy and operational autonomy because having to go cap in hand to government could threaten their credibility and policy independence.

In some cases large risks have resulted in historic losses that have depleted central bank capital. And in other cases – for example, Chile, the Czech Republic and Israel – central banks have for years operated successfully with negative capital. But in those cases, other conditions played an important role in preventing their loss of credibility and autonomy. In Chile, large fiscal surpluses counteracted the central bank's deficit, which arose from the financing of bank rescues in the early 1980s and losses on foreign exchange assets as the exchange rate appreciated (Marshall (2003)). In the Czech Republic, the central bank's seigniorage income remained sufficient to provide confidence that capital would be rebuilt over time. Moreover, in all three cases, the erosion of capital had stemmed mainly from the strengthening in the market value of their own currency liabilities (which imposed losses on foreign exchange reserves) rather than from the issuance of their liabilities against insufficient value (as, for example, tends to be the case when central banks bail out insolvent financial institutions).

But history is not replete with such positive outcomes. It is more common for countries with negatively capitalised central banks to have ineffective monetary and financial policies. Such episodes occurred in Venezuela and Jamaica in the 1980s and 1990s,

and empirical cross-country evidence indicates a negative relationship between central bank financial strength and inflation performance.¹²²

On the other hand, a central bank can have an excessive amount of capital. A central bank with a capital buffer that seems to be unnecessarily large would be less able to resist pressures to make (inappropriate) loans of last resort. And if the central bank is seen as enjoying an abundance of resources while other arms of government are subject to tight fiscal discipline, it may attract government interference that weakens its independence. If a central bank's monetary, exchange rate and financial arrangements expose it to very little risk, it arguably needs very little capital. Such central banks include those with floating exchange rates, those that manage foreign exchange reserves only as an agent for the government, and those that would be indemnified for losses resulting from loans of last resort.

At the other end of the spectrum, central banks that operate currency board type regimes that back parity with the euro or US dollar are exposed to risks that could result in very large future losses and, in recognition of this, are strongly capitalised. The balance sheet of those central banks includes very substantial holdings of foreign currency assets because the risk of loss is high should parity not be maintained for any reason. The substantial amount of capital on the balance sheet both supports confidence in the sustainability of the fixed exchange rate and provides a buffer against potential losses.

5.2 Frameworks for determining capital adequacy for a central bank

Some central banks use the Basel framework in reporting their capital. Nonetheless, the considerations relevant to determining an adequate level of capital for a commercial bank are fundamentally different from those for a central bank. Moreover, although the framework for determining capital for commercial banks is well established, no counterpart for central banks is similarly established.

Some central banks have sought to develop frameworks for establishing the appropriate amount of capital. These generally seek to establish the capital required to ensure that the balance sheet generates sufficient income to (1) cover its operating costs and (2) absorb financial losses that could arise from the exposures embedded in its balance sheet and/or its monetary, exchange rate, and financial policy functions. Simulation, value-at-risk and scenario analysis techniques have been used by, among others, the central banks of the Netherlands and Sweden to assist in making these assessments.¹²³

These more formalised techniques for assessing the appropriate level of capital can be, of course, importantly dependent on assumptions about key variables such as future trends in currency issuance and volatilities in financial market prices. They can also depend on judgments about the extent to which additional allowances might need to be made for "long tail" events. A number of major central banks have recently sharply altered their risk exposures as a result of extreme events – eg the temporary seizure of core interbank money markets – with the result that new calculations on the appropriate level of capital may be motivated. Of course, the capital required to buttress a central bank's reputation and credibility also are, at least to some degree, a

¹²² Stella (2008).

¹²³ BIS (2005a, unpublished) contains a summary of the asset and liability simulation modelling used by the Netherlands Bank. See Ernhagen, Vesterlund and Viotti (2002) for an analysis undertaken at the Sveriges Riksbank.

matter for judgment and will be influenced by each central bank's history and track record.

The nature of the financial rights and responsibilities of a central bank's stakeholders can also be relevant for determining the appropriate amount of capital. For example, if the central bank law includes provisions that require the government to forgo receipt of a distribution from, or to recapitalise, the central bank should it incur a loss, there may be less need for a buffer to cover such contingencies. These aspects are considered next.

5.3 Income distribution procedures and practices

For most central banks, distributions of income to the government occur annually and are determined in light of the preceding year's financial result.¹²⁴ The income distribution decision comprises three major elements: (1) determination of the distributable amount; (2) the rules or practices that govern the decision on how much of that amount should be transferred to the central bank's reserves to build its capital; (3) how much should be transferred to stakeholders (generally the government).¹²⁵

Counting revaluation gains and losses in the income statement increases the volatility of the amount seen as available for distribution. This is an issue for governments that expect a steady dividend from the central bank. A particular concern for central banks is that the inclusion of balance sheet revaluation gains and losses in the calculus of distributable income may result in an asymmetry, with distributions being made in years when gains are recorded but not being reversed when revaluation losses are incurred. Even if no distribution is made in years when losses are incurred, this asymmetric approach could, over a number of years, deplete the central bank's capital.

Some central bank laws, such as those of Australia and the ECB, take explicit account of the potential for revaluation adjustments to reduce the central bank's capital. In Australia, both unrealised valuation gains and unrealised valuation losses are excluded from distributable income, although with the proviso that distributable income is reduced by the amount by which unrealised losses exceed the balance of accumulated unrealised amounts previously transferred to the revaluation reserve. This approach bases distributable income on a measure closer to what the Reserve Bank of Australia describes as "underlying" income (net interest income less operating expenses plus net realised gains); however, the deduction of net accumulated unrealised losses from distributable income provides a tilt toward conservatism. In the case of the ECB, unrealised valuation gains are excluded from distributable income – which counteracts the tendency towards asymmetric distributions.

An alternative approach to smoothing distribution in the face of volatile central bank income, adopted by some of the Nordic countries, is to determine distributable income as an average of accounting income taken over a number of years, so that revaluation gains and losses may largely cancel out.

Central banks differ significantly in their rules and practices for allocating income between reserves and distribution, but in this regard, most central banks fall into one of

¹²⁴ Although the distributions are made weekly in the United States.

¹²⁵ In the case of the ECB, the national central banks of the Eurosystem. Also, in the case of the Federal Reserve System, the commercial bank shareholders of the regional Federal Reserve Banks are paid a 6% per year dividend on their shareholdings, with the balance (after reserving) paid to the US Treasury. The Swiss National Bank is another central bank (of only a handful) with private shareholders, and as such also pays dividends to institutions besides the government.

two categories. In the first category, comprising a relatively large number of countries, a “graduated sharing approach” bases the amount to be transferred to reserves on the existing level of capital; or on capital in relation to an indicator such as banknotes in circulation, which allows for the required level of capital to expand as the economy grows. For example, the Governing Council of the ECB can determine that an amount of up to 20% of net income can be transferred to the general reserve fund (subject to a limit equal to 100% of paid-up capital) and thereafter pay all net income to its shareholders in proportion to their paid-up shares. Similarly, in Malaysia, if reserves are less than one half of paid-up capital – and in the United States, if reserves are less than paid-up capital – net income is transferred to the reserve and the remainder to the Government. In Indonesia, net income is retained until capital reaches a targeted level, as is the case in Switzerland, where the targeted level of capital is set with reference to the amount of banknotes in circulation.

A fully rules based sharing approach is used by a small number of countries within this first category, most notably emerging market economies with central bank laws of recent vintage: in some of these countries, the law prescribes that net income is to be allocated in fixed proportions – for example, in Korea and the Philippines, 10% and 25%, respectively, of net income is to be transferred to reserves.

For some in this category (including Australia and New Zealand), the central bank law does not provide any quantitative rules but instead defines a process by which either the board of the central bank or the government, either independently or in consultation with the other, determines the allocation of net income between reserves and dividends.

The second category of central banks comprises relatively few countries. They transfer, either formally or informally, virtually all of their net income to the government. In the case of the Bank of England, the income of the Issue Department, which issues the currency, is automatically transferred to the Government, as are the earnings generated by the Bank’s other operations, unless the Chancellor of the Exchequer agrees to a share of income being retained as reserves. In Canada, the established practice before 2007 was for the full amount of net income to be transferred to the Government. Although that remains the case, the Bank of Canada Act was amended in 2007 to establish a special reserve fund (with a ceiling of CAD \$400 million) for potential unrealised valuation losses due to changes in the fair value of the Bank’s “available for sale” investment portfolio. With this new reserve, the Bank of Canada still maintains a very low level of capital in relation to its total balance sheet. In contrast, a large proportion of the net income of the Hong Kong Exchange Fund (which is managed by the HKMA) typically is retained as reserves (including fiscal reserves), which has resulted in the accumulation of a very large capital buffer.¹²⁶

As these examples suggest, central banks whose balance sheets comprise mainly domestic currency assets – and hence are not subject to substantial variations in earnings as the result of changes in exchange rate valuations – are more likely to transfer most or all of their net income to the government. They are correspondingly less likely to incur future losses that could call at some stage for the government to recapitalise the central bank.

¹²⁶ In the case of the People’s Bank of China, the transfer of income to the Government is even more direct and immediate: all revenues are passed to the Government, which in turn meets the People’s Bank’s expenses.

A general key point here is that the rules for calculating income and the rules for determining any distribution of it interact with each other in ways that can have a major bearing on the evolution of a central bank's capital. And the move by many countries to adopt IFRS currently is casting new light on the matter. Some central banks to date have elected not to adopt IFRS, or not fully adopt it. The reason appears to be that the consequent volatility in reported income from year to year – owing to required revaluation of the substantial exchange and interest rate positions embedded in most central banks' balance sheets – could give a misleading picture of the central banks' results, which, given their policy roles and responsibilities, need to be viewed in a more medium-term context. Also clearly apparent from the foregoing discussion are the important interactions between balance sheet structure, accounting policies, income distribution rules and the central bank's capital, and the need for these to be formulated as an integrated package rather than be revised in a piecemeal manner.¹²⁷

6. The operating budget

As a part of the public sector that is usually outside of the government budget process, and as an institution that normally lacks a natural budget constraint, central banks are wary of being perceived as fiscally undisciplined. In some places, the apparent contrast between them and other government agencies is heightened by the higher salaries paid by the central bank to attract a staff whose alternative employment opportunities include the high paying financial private sector. As pressures rise on other government agencies to trim costs and increase efficiency, central banks in many countries have thus sharpened their focus on the efficiency of their operations.

To ensure that their use of operating resources is disciplined and effective, many central banks during the past decade or so have strengthened their budgeting, planning and financial reporting processes. Overall operating expenses – generally not large compared with balance sheet net income and revaluations – are funded by most central banks from their own gross revenue. In most such cases, the budget approval process does not entail ex ante authorisation by the government, but in many it does entail ex post approval. In some countries, new arrangements for determining the central bank's operating budget have been introduced as part of wider changes to the relationship between the central bank and the government.

Central to the non-financial component of operating costs is the fact that central banks are knowledge based organisations. Correspondingly, personnel expenses probably constitute the largest component of non-financial operating expenses for most central banks. Other significant operating costs include those related to banknote printing, premises, general administration and information and communication technology. The last includes the tools needed by knowledge workers (analysts, managers and clerical staff) and by the financial and payment systems in which central banks typically invest heavily.

¹²⁷ For example, in 2007 the Reserve Bank of New Zealand changed the foreign exchange structure of its balance sheet from being fully hedged against exchange risk to a net long position in foreign exchange. That change made the government realise that an amendment to the central bank law would be required to avoid inappropriate volatility in reported income and in the distribution of income to the Government.

6.1 **Determining the operating budget**

The institutional arrangements by which the central bank operating budget is determined can be grouped into three broad categories:

- a corporate planning and budgeting model;
- a government planning and budget model;
- an intermediate model, under which high-level and longer-term parameters are set by or agreed with the government, and the central bank follows a corporate planning and budgeting process within those parameters.

The most common approach is for the central bank to formulate its budget within essentially a corporate planning and budgeting framework. In the majority of those cases, including, for example, the Austrian National Bank and the Monetary Authority of Singapore, executive management is responsible for the formulation of a proposed budget – generally supported by strategic and operational plans – for approval by the central bank’s supervisory board (Figure 38).

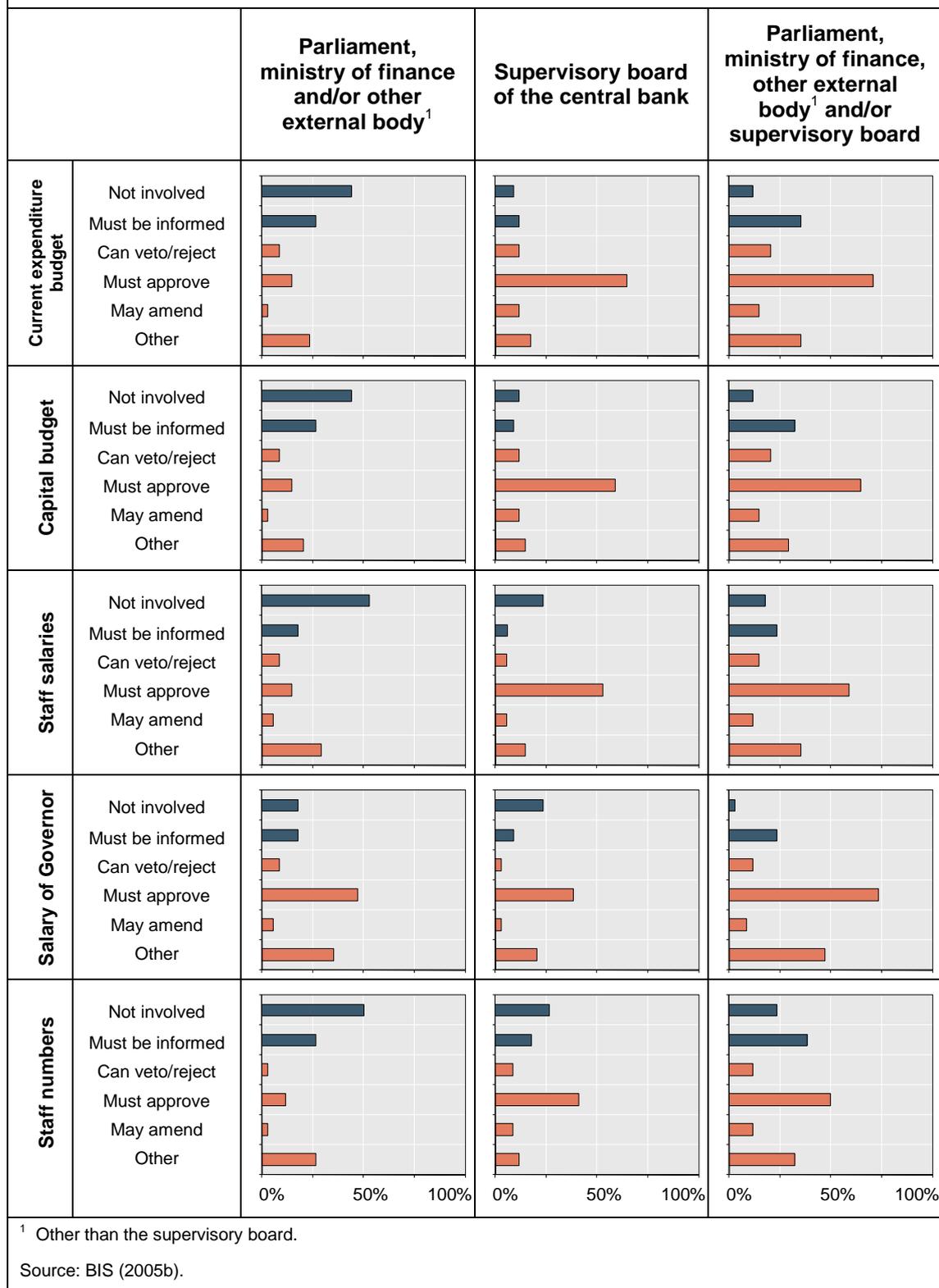
The defining characteristic of the budgeting process in these central banks is that the government or the legislature does not approve the budget *ex ante*, though those branches of government will often receive the budget for information. Some of the central banks that plan and budget this way (about nine central banks canvassed in a 2005 BIS survey (BIS (2005b)) disclose their budget to the ministry of finance, for information, before it is approved by the central bank board. Most of the remainder disclose their plan and budget after formal adoption, including in some cases in the central bank’s annual report or by some other reporting process.

At the other end of the spectrum, some central banks’ operating budgets, although funded from their own revenue streams, are subject to government authorisation to control expenditure. As Figure 38 indicates, the current and capital expenditure budgets of around one fourth of central banks are subject to approval, veto or amendment by an external body such as parliament or the ministry of finance. These central banks do not have the authority to incur outlays that have not been approved by the government. The arrangement tends to be more common in emerging market economies – a notable example is China – than in advanced economies.

The third, intermediate, approach is for the government to establish a framework that limits the overall size of the central bank’s operating budget for a multi-year period. The central bank itself determines its annual plan and budget within those bounds. Having a multi-year framework – five years in the case of the Reserve Bank of New Zealand and the Bank of England – reduces the risk that policy decisions will be subject to political influence via the budget process. This approach is one element of new arrangements the respective Governments established in the 1990s to provide the central banks with greater autonomy within the “Westminster” (UK-style parliamentary) system of government.

Figure 38
Respective roles of the supervisory board and outside bodies
in relation to expenditure budgets

Per cent of 34 central banks



To some extent, the intermediate approach separates the funding of the central bank's operations from the income derived from the balance sheet, and in comparison with the other two approaches, it establishes a more direct link between the resources available to the central bank and those needed to perform its operational functions.¹²⁸ In contrast, income derived from the balance sheet is influenced by a range of other factors (as discussed in Section 2 above). As a result, income tends to bear little relationship to operating costs, and depending in part on the accounting conventions applied (which are discussed in Section 4.3), income can fluctuate widely from year to year whereas resource requirements for annual operations tend to be relatively stable.

6.2 Promoting effectiveness and efficiency of resource use¹²⁹

Budgeting requires planning and monitoring, regardless of whether the operating budget is subject to government approval or is the responsibility of the central bank's supervisory board. If anything, the need for such planning and monitoring may be greater in the latter case – greater autonomy generally is associated with the need for more rigorous accounting.

Because central banks are not profit-seeking institutions, their proposed expenditures cannot be evaluated against hard yardsticks such as revenue per dollar spent. Instead, their expenditures need to be evaluated in terms of whether they contribute to better policy outcomes, a connection that is usually imprecise and difficult to determine. Central banks therefore use more varied techniques than do firms in the private sector to ensure that the resources allocated through the budget are used effectively and efficiently.

6.2.1 The planning process

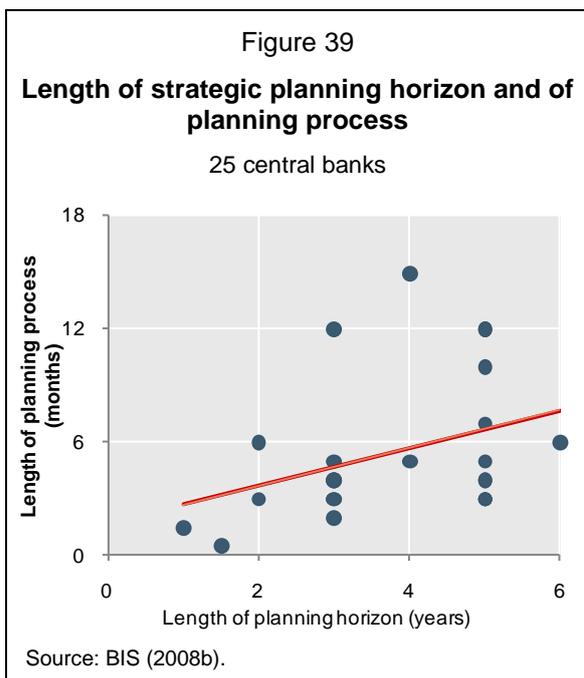
Most central banks undertake a planning process before developing the operating budget. The purpose is to identify organisational goals and priorities so that resources are allocated accordingly. Rigorous planning helps management scrutinise and assess the likely value of proposed policy and research work and, as at the Reserve Bank of Australia, to weed out proposals unlikely to warrant the resources required.

A common practice – pursued, for example, at the Bank of Canada and the Sveriges Riksbank – is to commence the planning process with an “environmental scan” for potential major emerging issues or changes in the wider economic or political setting that could affect the central bank. Some central banks have developed the practice of involving outsiders in the process, including “wise people”, members of the central bank's supervisory board or international experts, to bring an independent perspective. The People's Bank of China and the Monetary Authority of Singapore both have panels of international experts who contribute in this way. The aim is to be forward-looking and lateral, with a view to preparing the central bank for potential new demands on it as well as, where appropriate, helping to shape emerging issues. Typically, the process results in a medium-term strategic plan, covering a rolling three- to five-year horizon,

¹²⁸ Indeed, in the United Kingdom, all the Bank of England's seigniorage income is passed directly to the Government, and the five-year budget allocation is funded by returns on the investment of the compulsory (but non-remunerated) reserve deposits made by commercial lenders.

¹²⁹ Effectiveness concerns achievement of desired objectives (outputs), and efficiency concerns doing that with the least possible use of resources (inputs). Central banks are concerned with both, though in the final analysis most central banks would not seek gains in efficiency at the expense of policy effectiveness.

which sets the context for the development of a more focused plan (and budget) for the year ahead.



The length of the planning process tends to vary with the length of the planning horizon (Figure 39). Some central banks have established a separate unit – sometimes attached to the office of the governor – to coordinate the planning process. For example, at the Austrian National Bank, the Organisational Analysis Project Group plays a central role, and similar units exist at the Central Bank of Malaysia and the Monetary Authority of Singapore. At other central banks, the planning process is more decentralised, often supervised by a committee of senior officers or executive board members assembled for the task; the Bank of Canada and the Bank of England manage planning processes along these lines.

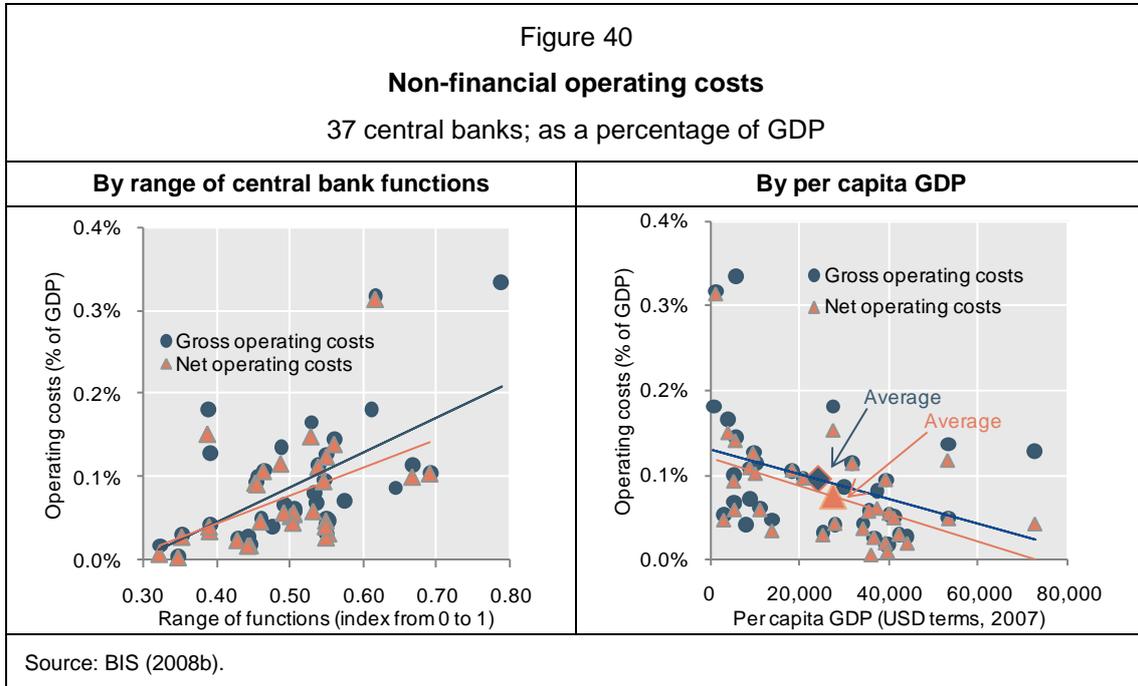
Another dimension concerns whether to adopt a “top down” or “bottom up” approach. The former typically commences with high-level objectives being developed at executive board level. Divisional units then develop more detailed and operational plans. A bottom up process, by contrast, begins with divisional units identifying priorities and projects, which are then assessed and melded into the overall plan. The latter tends to be a more participative, though more time-consuming, process. It has been used by some central banks as a change management tool when major reform was underway and staff buy-in was an important goal. A bottom up approach also appears to be used by central banks in which formal planning and budgeting have been long established and the processes are well embedded at the divisional level (such as at the Board of Governors of the Federal Reserve System).

Besides supporting the budget process, formal plans provide a reference point for monitoring performance, both as part of the internal management process, as in any organisation, and externally as an element of the mechanisms by which independent central banks are held to account. A formal plan provides a sound basis on which a supervisory board, the government and the wider public can assess the central bank’s performance. For example, the supervisory board at the Reserve Bank of New Zealand seeks regular “balanced scorecard” reports on progress against plan. Also, a number of central banks now centre their annual reports on reviews of performance against planned outcomes and objectives and provide an outline of the work plan for the next period; some of these elements are illustrated in the recent annual reports of the Bank of Canada, the ECB, the Sveriges Riksbank and the Bank of England.

6.2.2 Benchmarking and peer review

Due to their unique combination of functions and their place “in between” the public and private sectors, central banks find it difficult to identify suitable domestic benchmarks against which the efficiency of their operating expenditures can be assessed. Comparing central bank expenditures internationally is also complicated by differences in function and situation. A larger spread of functions tends to increase operating costs, indicating negative economies of scope, while central banking tends to be more

expensive in poorer countries (Figure 40) – two tendencies that may be related to each other by virtue of a tendency for poorer country central banks to be allocated a bigger range of functions (see Figure 3 in Box 2).



Many central banks now conduct benchmarking exercises to measure their performance against that of organisations with similar functions. Depending on the function being benchmarked, those other organisations can be private firms as well as central banks. Among the benchmarking exercises at the Bank of Canada, for example, have been those targeting note printing and distribution, human resources, and information technology (IT) services. The Bank of Mexico requested a mission from the International Monetary Fund to carry out a benchmarking of their payment system. In a slightly different vein, the Federal Reserve System not only uses benchmarks but also tracks internal productivity measures across a range of activities over time, such as cost per payment made and person hours per bank inspection.

Policy, analytical and research functions are less amenable to benchmarking because the outputs are difficult to quantify. Nonetheless, a number of central banks have subjected their policy processes and practices to comparative evaluations with the help of external experts, often from another central bank. Examples include reviews of monetary policy at the Reserve Bank of New Zealand, the South African Reserve Bank, the Sveriges Riksbank and the Bank of England, undertaken in each case by a leading academic or a central banker from another country; and a review of the Sveriges Riksbank's *Financial Stability Report* by a team comprising an IMF executive, an academic and a commercial banker. The Bank of Canada also recently commissioned a committee of five outside experts from academia and the Federal Reserve System to conduct a review of its economic research activities.

6.2.3 Outsourcing and contestability

Benchmarking has been used both to promote productivity improvements within the central bank as well as to assess whether existing activities could be performed more effectively or efficiently if they were outsourced. At some central banks, the latter

question has been driven by a strategic view that activities ancillary to what they identify as their core functions should be outsourced or divested unless they have strong reasons to retain them. This view has been reflected, for example, in the outsourcing of some elements of physical security and the distribution of banknotes, of cleaning and catering services, and of some IT services, including at the Austrian National Bank, the Sveriges Riksbank and the Bank of England. An activity often partly outsourced by central banks that manage foreign exchange reserves is the portfolio management function either as an operating procedure or as a live benchmarking exercise. Benchmarking, however, has not always resulted in outsourcing; at the Reserve Bank of Australia, the IT function and aspects of the banking services provided to the Government were benchmarked and put up for tender but ultimately retained, and workers compensation (occupational risk) insurance was brought in-house on efficiency grounds.

Related to benchmarking is the practice at some central banks of “charging” operating divisions for their use of internally provided services such as human resources management, accounting, IT and the services of the governor’s office, usually according to a relatively simple formula. Such procedures are applied by the Bank of Canada, the Sveriges Riksbank, the Bank of England and the Federal Reserve System, among others. The relationship of this practice to benchmarking is clearest when the internal services are seen, at least in principle, as being externally contestable, that is, as potential candidates for outsourcing. Even where contestability does not apply, however, some central banks see value in applying internal charging for both the users and providers of the charged services: for the functional divisions, it provides a fuller sense of the cost of their outputs; and for internal service providers, it can better attune them to the needs of their, albeit “captive”, clients.