



REPORT

CENTRAL BANK OF ICELAND

No. 6

Prudential Rules following Capital Controls

*Report of the Central Bank of Iceland
to the Minister of Economic Affairs*

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Approach and structure of the Report

This report discusses those prudential rules which preferably should be in force when capital movements once more become unrestricted. The experience in the run-up to the financial crisis has shown that, while unrestricted financial movements can encourage fixed-capital formation and growth, they also involve risk for the financial system and domestic economy, which must be mitigated with prudential regulation and robust financial oversight. Relaxation of the current controls on capital outflows could result in currency market instability. Both residents and non-residents hold substantial ISK assets which are currently locked in by the controls. When the controls are removed, therefore, a considerable capital outflow could result, even though plans for relaxing the controls in stages are aimed at reducing this risk as far as possible. This report gives an account of prudential rules which could reduce the risk to financial stability inherent in unrestricted capital movements, in particular, the risk of currency mismatch and maturity mismatches in foreign currencies. Various other prudential rules, which contribute to increased financial stability in general but are not directly linked to cross-border capital movements or FX transactions, have been under discussion both internationally and domestically. They are not included in this discussion.

The report is comprised of two parts: the former provides a summary of the main proposals for prudential regulation of capital movements, while the latter discusses these prudential rules in detail, together with other options. It is intended to contribute to debate on the selection of rules and their implementation.

I. Principal proposals and action plan

1. Unrestricted capital movements: the main risks

The Central Bank has submitted a schedule for relaxing capital controls in stages, aimed at removing the controls as soon as possible without jeopardising stability. It is important to establish prudential rules to promote stability and reinforce confidence in the financial system before the existing controls on capital outflows are finally removed.

A free flow of capital between countries boosts value creation and welfare, in part through better utilisation of the factors of production and diversification of risk, but capital flows are not without risk. In the light of recent experience in Iceland and other countries, three types of risk can be mentioned especially: firstly, volatile capital movements which are pro-cyclical; in the second place, currency mismatch on domestic parties' balance sheets; and thirdly, maturity mismatch in foreign currencies on the balance sheets of financial institutions headquartered in the country.

Unrestricted capital movements involve a risk of an immoderate capital inflow, which can flow out of the country again with scant warning. A strong capital inflow raises asset prices, the exchange rate and purchasing power, and boosts imports, resulting in a higher current account deficit and accumulation of foreign debt. Such an immoderate inflow of capital therefore generally amplifies an economic upswing. The period of strong capital inflow often concludes abruptly, with a reversal of capital flows (an outflow), exchange rate depreciation, falling asset prices and shrinking equity, lower purchasing power, defaults and insolvencies. A sudden transformation of this sort can amplify an economic contraction or even cause it.

A currency mismatch develops on balance sheets when loans in one currency are used to finance asset purchases in another currency. As a result, assets and liabilities do not move in step with exchange rate movements. A clear example of this sort of risk is the impact of the ISK exchange rate plunge in 2008 on the balance sheets of public corporations, local authorities, private enterprises and households with FX debts well exceeding their FX assets. Their debts soared while the value of domestic assets remained unchanged or fell, eroding their equity substantially.

A mismatch of foreign currency maturities develops when long-term FX assets are financed with short-term obligations, such as deposits and repos in the same currencies. Such mismatch creates a risk for the domestic financial system especially in instances where both funding and investment takes place abroad, as the example of the Icelandic banks shows. The risk materializes when it proves impossible to roll over short-term financing or it is withdrawn. When such a deposit flight results in liquidity problems for a solvent financial undertaking,¹ it is the Central Bank's role to serve as lender of last

1. The term solvent financial undertaking here refers to financial undertakings facing liquidity difficulties but whose assets exceed their liabilities.

resort. Central banks' possibilities of providing emergency credit in foreign currencies, however, are limited. Their ability to provide such credit is limited by the size of their FX reserves or credit lines in foreign currencies from other central banks. Therefore a run on short-term financing could cause a default in foreign currency even by solvent financial undertakings, with the accordant consequences for financial stability and the economy.

The removal of capital controls in Iceland involves risk exceeding that which is generally inherent in free capital movements. The controls lock in non-residents' holdings in ISK deposits and securities, which currently amount to approximately the equivalent of one-quarter of Iceland's GDP. Distributions to creditors from the estates of the failed banks will add somewhat to non-residents' ISK assets. The aim is to convert the impatient portion of these assets, in so far as possible, to long-term assets as part of the controls relaxation process. In addition, some capital may have been accumulated by residents, including pension funds, who wish to invest abroad when the opportunity arises. It is therefore crucial that when the controls are removed, provisional prudential regulations exist to prevent an immoderate short-term outflow of capital.

2. Central Bank Proposals

Before fully removing the currency controls, the Central Bank considers it desirable to reinforce the regulatory framework with prudential rules aimed at mitigating the risk arising from unrestricted capital movements. The principal improvements which can be envisaged, in the Central Bank's estimation, are the following.

i. Rules on liquidity and foreign currency balance

The Central Bank intends to adopt new rules on financial undertakings' foreign currency balance and liquid funds. The objective of these rules is to reduce maturity mismatch in foreign currencies.

New liquidity rules will be modelled on the Basel III rules, which aim at ensuring financial undertakings have sufficient liquid funds to survive an acute stress scenario lasting for up to one month (Liquidity Coverage Ratio, LCR), and stable sources of funding to enable them to withstand a shut down of credit markets of up to a year (Net Stable Funding Ratio, NSFR).² The rules will be adapted to Icelandic circumstances, in part by distinguishing between currencies and by extending the horizon of the NSFR for foreign currencies to up to three years, to ensure that domestic financial undertakings can withstand a shut down of foreign credit markets of up to three years without having to use the country's foreign currency reserves. By this means, very strict limits are set on maturity mismatch in foreign currencies. For more details see Section 5.2.

New rules on foreign currency balance must consider the definition of foreign assets and liabilities, to limit financial undertakings' possibilities to take FX loans to finance FX lending to domestic borrowers who have neither FX assets nor income. By so doing currency

2. The Basel III rules are described in more detail in the second part of the Report.

mismatch on both households and corporate balance sheets can be limited. For more details see Section 5.1.

The intention is to have proposals for new rules on financial undertakings' foreign currency balance and liquidity available by the end of this year.

ii. Limits on deposit taking abroad

New rules are to be adopted and existing statutory provisions utilised to significantly reduce domestic financial undertakings' possibilities of taking deposits in foreign currencies from non-residents. This will reduce foreign currency maturity mismatch and also underline the role of the Central Bank of Iceland as a lender of last resort only in ISK.

The Central Bank of Iceland can only serve as lender of last resort in foreign currencies to a very limited extent; a policy stating otherwise would be neither credible nor legitimate, nor consistent with the basic idea of the role of a lender of last resort, which is based on the central bank's unique ability to issue currency. Non-residents' FX deposits would therefore always prove to be unstable funding, as Iceland's experience has shown.

To reduce foreign deposits, the incentive of domestic credit institutions to accept such deposits can be reduced and/or non-residents deterred from offering such funding.

Firstly, the acceptance of such deposits can be made considerably less attractive by treating foreign currency deposits as unstable funding in the Central Bank's liquidity rules or by increasing banks' reserve requirements in connection with such obligations. Secondly, the authorisation of domestic financial undertakings to accept such deposits could be significantly curtailed, having regard for international commitments. Thirdly, the supply of foreign deposits can be limited by stating clearly in new legislation on the Depositors' and Investors' Guarantee Fund that the Fund may make distributions to depositors in ISK, regardless of whether the deposits were originally in other currencies. For further details see Sections 5.2 and 5.3.

iii. FX loans of unhedged parties

To limit currency mismatch, it is recommended that restrictions be placed on lending in foreign currencies to local authorities, households and others who lack income or assets in a foreign currency. This can be done directly through statutory provisions or indirectly through prudential rules.

When households, businesses and local authorities take FX loans and rely on ISK income to make the payments on these loans, it creates credit risk which can result in increased defaults in times of high exchange rate volatility. Although the currency mismatch may not appear in the accounts of the credit institutions granting such loans, if they are granted and funded in the same currency, they are equivalent to a currency risk. Even though the borrower may formally bear the currency risk, it is transferred to the lender if the borrower cannot make the payments due to unfavourable exchange rate developments.

In order to limit borrowing in foreign currencies by parties who lack foreign currency income, stricter requirements could be applied regarding loan-to-value (LTV) ratios, assessment of payment capacity or capital, reflecting the currency risk inherent in such lending activities. An outright ban on foreign currency lending to local authorities, households and others without foreign currency income or income linked to the exchange rates of foreign currencies can also be considered. Such rules would limit the *currency mismatch* in the overall economy. The Central Bank proposes that a working group be set up, comprised of representatives of the Ministry of Economic Affairs, the Financial Supervisory Authority and the Central Bank of Iceland, to draft proposals for implementation of such rules. For more details see Section 5.4.

iv. Instruments to curb capital inflows

Options to provide the Central Bank with new instruments, to curb pro-cyclical effects of capital flows, need to be examined. These instruments could take the form, for instance, of levies on capital transfers or special reserve requirements for foreign currency funding.

Instruments to curb immoderate fluctuations in capital flows can be useful to counteract the amplifying effects of free capital movements. Levies on capital transfers and reserve requirements for foreign currency funding are examples of potential instruments. Such instruments directly impact the profitability of short-term capital movements and can therefore reduce an unstable inflow in an upswing and the outflow in a downturn. For more details see Section 5.7.

The Central Bank proposes that a working group be set up to examine the advantages and disadvantages of, and arrangements for, the possible options available, taking international obligations into consideration.

v. Temporary restrictions on increases to pension funds' foreign assets

When controls on capital outflows are relaxed, it is recommended that statutory provisions be adopted to determine how rapidly the funds' assets may be increased once more to the authorised limit.

The assets of Icelandic pension funds are substantial in relation to the country's GDP and the domestic financial market. An outflow of capital resulting from the adjustment of their asset portfolios to their long-term investment strategies following the removal of currency controls could create strong pressure on the currency. To respond to this, rules need to be adopted limiting the amounts the pension funds can allocate for investment abroad over a specific period. The limits would be relaxed in stages, until full liberalisation was achieved within the current legal framework. Such an arrangement is consistent with the procedure followed when pension funds' foreign investments were first authorised. For more details see Section 5.6.

The Central Bank proposes that a working group be set up under the auspices of the Central Bank, the Financial Supervisory Authority and the relevant Ministries to draft proposals for "speed limits" on pension funds' foreign investments.

If these proposals are acted upon, and comprehensive and effective rules adopted, it will reduce risk in the system as a whole. The objective is to mitigate the pro-cyclical amplification of an unrestricted capital flow and the risk an immoderate flow can create for financial undertakings, local authorities, individuals and businesses in Iceland. The aim is also to enable Icelandic banks to withstand up to a three-year shut down of foreign funding markets.

The Central Bank will increase emphasis on active and forceful supervision of the rules on foreign currency balance and liquidity. In order for the Central Bank to perform its role effectively, it must be able to request a variety of additional data directly, data exceeding what is precisely stipulated in the rules but which could be of significance for its role in encouraging an efficient and sound financial system and as a lender of last resort. This includes details such as the terms and conditions of credit lines, available collateral, information on subsidiaries, the relationship between a subsidiary and parent company and potential for contagion between the two.

The rules described above in fact not only limit systemic currency risk and foreign currency liquidity risk, but the interaction of all of these rules will in fact restrict the banks' possibilities for immoderate growth.

3. Possible statutory amendments and compliance with the EEA Agreement

	<i>Instrument</i>	<i>Introduction/implementation</i>	<i>Type³</i>
1	Rules on liquidity and foreign currency balance The rules must be designed to prevent immoderate imbalances from developing. Especially strict rules needed against maturity mismatch in foreign currencies.	Art. 13 of Act No. 36/2001 specifies the assets which are to be included in calculating foreign currency balance. At present, the bank has no authorisation to exempt any exchange rate linked assets.	L
2	Limits on deposit taking abroad New rules on liquid funds will be adapted to this. Rules on reserve requirements can be used to achieve this objective, as well as provisions that the value of deposits can always be repaid in ISK, regardless of whether it was originally in another currency.	Current directives on deposit insurance schemes do not state what currency shall be used in reimbursing the value of deposits. However, a new draft EU Directive states that the value of a deposit shall be reimbursed in the same currency as the original deposit. If the new Directive is adopted unchanged, part of this will no longer comply with the EEA Agreement.	L
3	FX loans of unhedged parties Possible options include setting stricter requirements for LTV and capacity to withstand fluctuations in the debt service burden, increasing capital requirements or prohibiting such lending.	Depending upon the route chosen amendments could either be required to Acts or rules issued.	L/R
4	Levies on financial transfers An authorisation should be provided for a levy on financial transfers to and from the country, or for increasing reserve requirements on capital flows, with the aim of preventing immoderate capital inflows, possibly a levy or reserve requirement linked to the domestic-foreign interest rate differential.	Requires a statutory amendment	L
5	Speed limits on pension fund investments in foreign assets A maximum could be set, e.g. based on investment each month or the percentage of contributions in excess of pensions paid, for the amount allocated for foreign investments. Making amendments to these instruments would need to be a simple matter.	Requires a statutory amendment.	

3. Changes required to L = laws or R = rules and regulations.

II. Prudential Rules following Capital Controls

4. Structure and legal framework

4.1 Framework of the financial system

In 1994 Iceland became a member of the European Economic Area (EEA), which is based on the four freedoms, i.e. a free flow of goods, services, labour and capital in the European single market, often referred to as the European passport. The EEA Agreement forms the framework for regulation and supervision, based on EU Directives. Among other things, the Agreement enabled banks to pursue cross-border activities in the single market. In 2003, the privatisation of Icelandic commercial banks concluded; from 2003 to 2008 their assets soared from twice to ten times the country's GDP. Much of this growth was financed with short-term foreign borrowing and FX deposits abroad. In other words, the EEA Agreement could be said to have facilitated the banks' rapid expansion in a very brief period of time.

In the wake of the international financial crisis, its causes and possible improvements to the financial system, especially concerning regulatory flaws and risk management weaknesses, have been a frequent subject of research. The risk in cross-border banking activities was underestimated enormously prior to the financial crisis, especially where foreign currencies were involved. The flight of foreign capital from banks with international operations was a major factor in the development of the crisis. Since then, the legal framework and structure of the financial system has been subject to a thorough review. In the UK, the Turner Review (2009) spotlighted structural problems in the EU and suggested that a new institution be established to adopt rules for and oversee the supervision of activities of international banks. It was also proposed that states be granted greater authorisation to require their banks to pursue activities outside the home state through subsidiaries, or that limits be set for international deposit-taking. The De Larosière Report (2009) recommended better co-ordination of deposit guarantee schemes in the EU. This report also proposed that home states' responsibility for supervising their branches be reviewed and that a new European Systemic Risk Board (ESRB) be established with a European System of Financial Supervision (ESFS).⁴ The difficulty of sharing the cost of financial assistance for international financial activities remains to be resolved. The Basel Committee on Banking Supervision (Bank for International Settlements, 2010) recommended establishing a group to discuss the takeover and/or winding-up of international banks in difficulties, based on the home state rule, but with improved co-operation and co-ordination between home and host states.

The above-mentioned proposals fall short of what appears necessary if examined in the Icelandic context. The special risks of EEA

4. European System of Financial Supervision, actually the leaders of EU regulatory institutions, i.e. EBA, EIOPA and ESA.

and EU states which are not members of EMU need to be dealt with, especially concerning lenders of last resort in foreign currencies. The EEA/EU regulatory framework for deposit guarantee schemes (DGSs) proved unable to withstand deposit runs on international banks. Should the rule of home state responsibility for foreign branches hold, that would transfer the potential responsibility for deposits in the host state to taxpayers in the home state. If a common DGS for the EEA is not forthcoming, it is questionable whether banks in small states outside the Eurozone should be granted the rights implied by the European passport. DGSs are discussed in more detail in Section 5.3.

4.2 Prudential rules

One of the principal conclusions of international studies is that the financial crisis which began in 2007-2008 is a consequence of failure to respond to the greatly increased systemic risk during the economic upswing (Lim et al., 2011). The development and application of prudential instruments to address systemic risk was less advanced than the use of micro-prudential instruments. The regulatory emphasis in the upswing was accordingly directed primarily at ensuring the security and soundness of individual financial undertakings, an approach which was considered sufficient to maintain financial stability. As it turned out, this approach was not at all sufficient to prevent systemic shocks.

Following the financial crisis, international bodies have therefore focused on a new objective for the financial system regulatory framework, aimed at preventing an accumulation of systemic risk, referred to as macroprudential regulation. Macroprudential supervision focuses on the stability of the financial system as a whole, with the objective of limiting systemic risk and possible production loss due to financial shocks. Consideration is given to the fact that the behaviour of financial undertakings and their interaction can create endogenous risk. IMF has classified macroprudential instruments into three main categories (Lim et al. 2011):

1. Credit-related instruments, e.g. ceilings on credit growth, caps on LTV ratios, caps on the debt-to-income ratio and limits on foreign currency lending.
2. Funding-related instruments, e.g. limits on net open currency positions/currency mismatch, limits on foreign currency maturity mismatch and FX reserve requirements.
3. Capital-related instruments, e.g. countercyclical capital requirements, dynamic provisioning and changes to risk weighting.

Macroprudential instruments as such are closely related to traditional financial supervision instruments with microprudential objectives (Central Bank of Iceland, 2011).

Prudential rules related to currency risk

The relaxation of capital controls involves a general risk with regard to capital flows and the ISK exchange rate, and an accordant impact on price levels. In addition there is a risk with regard to the funding of banks and the Treasury. Free cross-border movement of capital limits

central banks' possibilities of managing financial system risk. This report sets out ideas for possible management instruments/prudential regulation following the capital controls.⁵ These are rules and instruments focusing on currency risk, and therefore do not encompass the full range of macroprudential rules and instruments to promote financial stability. These ideas are currently at very varying stages. Preparations are underway for the introduction of a few rules, but many are still at the discussion stage, and it is still unclear to what extent they are feasible. An effort will be made to highlight the advantages and disadvantages of the respective rules in tandem with an explanation of them. The accompanying table shows an overview of the prudential rules which will be presented.

Table 1. Prudential rules in connection with currency risk

Foreign currency balance - Section 5.1
Definition of foreign assets and liabilities
Absolute ceilings in addition to percentage limits
Liquidity rules - Section 5.2
Rules on liquidity in individual currencies
Longer time horizon for financing rules in foreign currencies
Increased liquidity requirements for foreign deposits
Foreign deposits and deposit insurance - Section 5.3
Priority of deposits upon winding-up
Reimbursement of secured deposits exclusively in ISK
Deposit money banks (DMBs) prohibited from accepting deposits abroad in branches
Ceilings on covered bonds issuance
Restrictions on foreign currency borrowing by domestic parties - Section 5.4
LTV ratios for foreign currency loans
Ceilings on the ratio of debt service on foreign currency loans to disposable income
Limits to interest subsidy on loans in foreign currencies
Limits to credit growth in foreign currencies
Limits on lending in foreign currencies to households, corporates and local authorities
Temporary restrictions on capital outflows upon the removal of currency controls - Section 5.5
Speed limits on pension funds' foreign investment
Other measures - Section 5.6
Levies on financial transfers
Varying reserve requirements for foreign debt
Additional capital requirements to cover volatility of capital adequacy ratios due to exchange rate movements

The Central Bank of Iceland sets rules on the foreign currency balance of credit institutions.⁵ These rules unfortunately did not serve the purpose of limiting the risk of currency imbalance in the economy. Roughly speaking, three things went wrong: In the first place, currency risk was actually transferred from credit institutions to households and businesses, which were not covered by rules on currency balance. Very few households had assets or income in foreign curren-

5. A credit institution is a financial undertaking which has been granted an operating licence as provided for in Points 1-4 of Art. 1 of Act No. 161/2002, on Financial Undertakings. This includes deposit institutions and various other credit undertakings, e.g. asset leasing companies.

cies, and the same applied to many businesses. Currency mismatch in the economy therefore increased despite the fact that the banks' currency balances were within their limits. Secondly, and this concerns rather enforcement of the rules, part of the banks' FX assets were not in fact in foreign currencies, because the collateral and cash flow underlying many foreign currency loans was in ISK, reducing the likelihood of their collection if the currency weakened significantly. In the third place, there was a major maturity mismatch in the banks foreign currency assets and liabilities, resulting in high risk of liquidity shortage in foreign currencies. Limits could have been set for foreign currency maturity mismatch in the Central Bank's liquidity rules, to reduce the liquidity risk in foreign currencies instead of defining liquidity without regard to currency, as is the case in current rules. This is discussed in more detail in Section 5.1.

International and Icelandic rules on liquidity

When the liquidity crisis began in the summer of 2007, Icelandic financial undertakings operated under an international regulatory framework, based more or less on recommendations of the Basel Committee on Banking Supervision, referred to as the Basel standards.⁶ The Basel standards have focused primarily on capital requirements for international financial undertakings. For some time the Basel Committee has also published guidelines on best practice in liquidity management.⁷ In 2008, the Icelandic Financial Supervisory Authority (FME) issued the main principles of the Committee' guidelines and updated them in 2010.⁸

New Basel recommendations are now available, Basel III, which are more comprehensive than before. The main change is that supervision will now have three pillars rather than focusing solely on capital ratios as previously. The objective of the standards is a) to provide additional buffers for financial undertakings' capital base, b) to introduce new liquidity standards, and c) to limit the leverage of financial undertakings. The liquidity standards in Basel III are comprised of:

- i. a liquidity coverage ratio, LCR, and
- ii. a net stable funding ratio, NSFR.

Legislation has already been adopted in the US which takes account of the Basel liquidity standards to some extent.⁹ In addition, the European Banking Authority (EBA) has been developing guidelines for the implementation of a harmonised maturity ladder template. The idea is basically similar to the NSFR, but provides for more detailed reporting.

6. The Basel Committee on Banking Supervision was established in 1974 by central banks in the G-10 countries. The Basel Committee prepares, among other things, various standards and guidelines for banking supervision. Guidelines set forth by the Basel Committee are not legally binding.

7. „Principles for Sound Liquidity Risk Management and Supervision“, last updated in September 2008, (BIS, 2008). These guidelines originated in “A Framework for Measuring and Managing Liquidity”, of 1992.

8. FME, Guidelines no. 2/2010.

9. The Dodd-Frank Wall Street Reform and Consumer Protection Act (2010).

Liquidity coverage ratio, LCR

The LCR is intended to ensure that financial undertakings have sufficient unencumbered, quality liquid assets, which could be converted to cash, to meet net cash outflows for the next 30 days, under an acute stress scenario defined in detail by the regulator. This should provide financial undertakings and regulators with sufficient opportunity to take suitable measures in response to altered circumstances.

$$\text{LCR} = \frac{\text{Quality unencumbered liquid assets}}{\text{Net cash outflows for the next 30 calendar days}} \geq 100\%$$

Secure assets included in this ratio are unencumbered, liquid in markets during a period with a large-scale dearth of liquidity and, not least, central bank eligible. Net cash flows refers to the net impact of out- and inflows. Generally speaking there are only two ways to satisfy the LCR if a financial institution's ratio is under 100%. It can either a) increase its liquid funds, as per the definition, or b) reduce its net cash outflow.

Net stable funding ratio, NSFR

The net stable funding ratio is intended to encourage stable financing for a longer term, of one year or longer. It is designed to ensure that long-term assets are funded with at least a minimum amount of stable funding sources, having regard to the liquidity risk. The NSFR is intended specifically to limit over-reliance on short-term funding, which proved to be one of the causes of the international financial crisis. It also gives more consideration to off-balance-sheet items and the risk linked to them. *Available stable funding* is the amount of equity capital plus deposits and obligations, which is expected to be relatively unchanged for the next 12 months. The *stable funding requirement* is an estimate by the regulator based on the financial undertaking's asset structure.

$$\text{NSFR} = \frac{\text{Available stable funding}}{\text{Stable funding requirement}} > 100\%$$

At an international level, an observation period for the NSFR is expected to begin in 2012, with minimum standards introduced in 2018.

According to the IMF Global Financial Stability Report (IMF, 2011), based on publicly available data, the NSFR of European banks appears to be somewhat below the minimum requirements proposed. The situation of US and Asian banks is considerably better. For the 60 international banks included in the sample, the need for additional funding was around USD 3,100 billion. The conclusion was also that the NSFR would not have been a reliable warning indicator of the liquidity difficulties of 2007-2008, (IMF, 2011). The NSFRs of banks which became insolvent during this period were relatively consistent with those of banks which are still in operation. As half of the banks

with NSFRs of less than 0.8 did, however, face major liquidity problems, the LCR could therefore be said to have some predictive value.¹⁰

Since the NSFR is limited to a term of one year, to monitor maturity mismatch in both the shorter and longer term, the EBA has developed a harmonised disclosure system referred to as a maturity ladder template. This disclosure, which can include a breakdown into individual currencies, provides good information on financial undertakings' possible funding needs for specific periods.

Liquidity rules of the Central Bank of Iceland and FME's liquidity requirements

The Central Bank of Iceland has adopted rules on the liquid funds of credit institutions, cf. provisions of Art. 12 of Act No. 36/2001. The Central Bank's current rules on liquid funds date from 2006. The objective of the liquidity rules is to ensure that financial undertakings always hold sufficient liquid funds to meet foreseeable and potential payment obligations during a specific period. The rules provide for a breakdown of assets and liabilities by type and assign different weightings depending upon their nature. Deposits, for example, have a low weighting as they are classified as fairly stable funding while short-term loans which are to be paid at maturity have a higher weighting. Assets and liabilities are classified into 4 periods, i.e. 0-1, 1-3, 3-6 and 6-12 months.

FME's requirements for the three large banks, as well as those savings banks which have undergone financial restructuring, stipulate, firstly, that they have available secure liquid funds equivalent to a minimum of 20% of total deposits, for the commercial banks, and 10% for savings banks and, secondly, that deposit institutions have liquid funds equivalent to a minimum of 5% of demand deposits. FME's liquidity requirements are, however, independent of other capital outflows, whether expected or unexpected.

5. Form of potential prudential rules concerning currency risk

This Chapter looks at what options are available to counteract the effects which a free flow of capital can have on a small, open economy. They include rules on foreign currency balance, liquidity rules, rules on deposit insurance, on limits to foreign currency borrowing by domestic parties, on pension funds' investment abroad and various other macroprudential instruments.

5.1 Rules on foreign currency balance

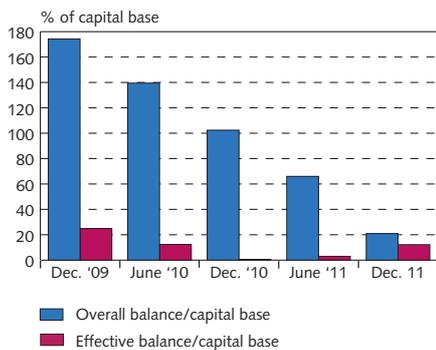
Current rules

According to the provisions of Art. 13 of Act No. 36/2001, the Central Bank of Iceland may set credit institutions rules on foreign currency balance.¹¹ The rules define their foreign balance as the difference be-

10. The study was based on publicly available data, and therefore supervision which is well directed and effective could likely improve the outcome substantially.

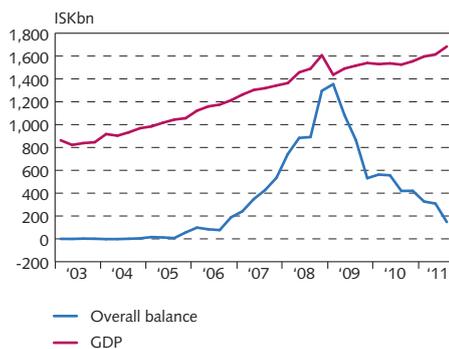
11. A credit institution is a financial undertaking which has been granted an operating licence as provided for in Points 1-4 of Art. 1 of Act No. 161/2002.

Chart 1
Overall and effective foreign currency balance of the three largest commercial banks¹



1. Overall balance in accordance with the CBI's Rules on Foreign Currency Balance. Effective foreign currency balance as assessed by commercial banks in their annual and interim financial statements. Sources: Central Bank of Iceland, commercial banks' annual and interim financial statements.

Chart 2
Overall foreign currency balance of the three largest commercial banks and GDP



Source: Central Bank of Iceland.

tween foreign-denominated assets and liabilities, on- and off-balance-sheet. The Central Bank's current Rules on Foreign Currency Balance, No. 950, entered into force in 2010. According to the rules, neither the overall foreign currency balance nor an open position in individual foreign currencies may be either positive or negative by more than the equivalent of 15% of a credit undertaking's capital base.¹²

Due to the circumstances which developed following the collapse of the banking system, a Temporary Provision was added to Rules No. 950/2010. The provision allows the Central Bank to grant credit institutions temporary authorisation to hold a special positive or negative foreign currency balance if necessary. Almost all credit institutions have availed themselves of this provision. The authorisation expires on 1 January 2013, after which credit institutions will have to comply with the 15% requirement referred to above.

Prior to the collapse of the Icelandic banking system, reports from the banks indicated that little currency risk existed. All the banks satisfied the Central Bank's Rules on Foreign Currency Balance and all of them held considerably more assets than liabilities in foreign currency. The Rules therefore failed to serve the purpose of reducing systemic currency risk. Currency risk in the economy increased, in part due to the fact that it had only been transferred from regulated entities to households and businesses with ISK income (See Section 5.4). This was possible because the Central Bank Act¹³ provides for all exchange rate linked assets and liabilities, as well as off-balance-sheet claims linked to foreign currencies, to be included in the balance. Many of the banks' foreign currency assets were in fact not in foreign currency, because the cash flow and collateral underlying them were in ISK, resulting in a high risk that they would not be repaid in full in foreign currency if the exchange rate fell substantially.

When the three large banks were reconstructed, FME demanded that the banks report each month on their so-called effective foreign currency balance, which is defined as the difference between assets and liabilities in foreign currencies at the end of the period but excluding those ISK items linked to the exchange rates of foreign currencies (FX/ISK).¹⁴ Capital reserves for currency risk are now determined solely by this effective balance.

Definition of foreign assets and liabilities

It would be desirable to amend Acts and Rules on foreign currency balance so that only actual foreign assets are classified as such. Conceivably the foreign assets of credit institutions will need to be checked against two definitions, i.e. firstly, by currency and, secondly, by whether the income and assets utilised by the banks' clients to make payments on the loans are foreign or domestic.

12. The Rules on Foreign Currency Balance, No. 950/2010, are available on the Central Bank's website, <http://www.sedlabanki.is/lisalib/getfile.aspx?itemid=8352>.

13. Art. 13 of Act No. 36/2001.

14. The methods used by the three banks in calculating their effective balance vary, but FME has gone over the methods applied by each of them to verify that they are adequate. In FME's estimation it is more important for the banks to restructure their loan portfolios than to harmonise the methodologies they apply.

Ceilings

One of the characteristics of the period prior to the banking collapse was that the foreign currency balance of the three largest commercial banks was within the limits provided for in the Central Bank rules, even though the overall balance increased rapidly in ISK terms from the beginning of 2006, especially at one commercial bank. To prevent the overall balance from becoming as large as it did prior to the collapse, ceilings could be set in the form of absolute amounts, rather than the percentage limits currently in effect. The ceiling could be determined, for instance, based on GDP and in such case reviewed annually.¹⁵

Balance as a percentage of ...

The Rules on Foreign Currency Balance assume that both the overall currency balance and balance in individual currencies refer to the capital base. The advantage of using the capital base is that it is calculated using standardised, international methodology. According to IMF data on various countries for 2010, the open position in foreign currency as a ratio of capital was used more commonly than as a ratio of the capital base (see Figure 2). It could possibly give a clearer picture if the balance were calculated as a ratio of e.g. equity on a parent company basis, Tier 1 equity, equity net of holdings in banks abroad, working capital and/or a macroeconomic figure such as GDP. It should be borne in mind that financial undertakings can manipulate both their capital ratio and equity - but not macroeconomic figures. Open currency position as a ratio of a macroeconomic figure could therefore serve as a type of absolute ceiling.

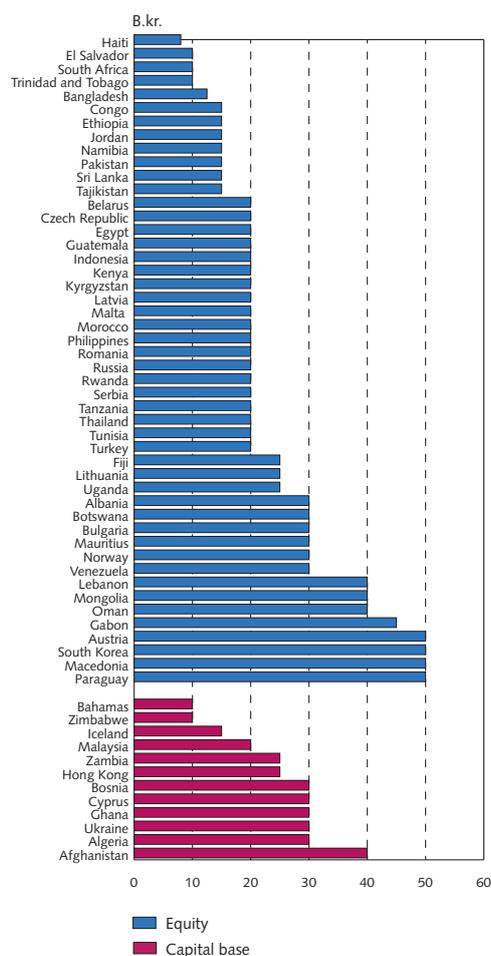
Maturity mismatch

The maturity mismatch in financial undertakings' (or other enterprises') foreign assets and liabilities is a cause for concern. Prior to the collapse, there was a major maturity mismatch in financial undertakings' foreign currency assets and liabilities, resulting in high risk of liquidity shortage in foreign currencies. To reduce their funding risk, the short-term funding of financial undertakings needs to be reduced and their long-term funding increased. South Korea, for instance, substantially reduced financial undertakings' short-term funding by adopting rules requiring at least 80% of long-term foreign currency lending to be financed with foreign long-term borrowing (Ostry et al. 2011). Monitoring and rules on liquid funds are even more conducive to reducing maturity mismatch of foreign assets and liabilities, cf. the following chapter.

5.2 Liquidity rules

As previously mentioned, the Central Bank of Iceland and FME have collaborated on a review of liquidity rules in recent quarters. Monitoring of liquidity may need to be extended to prevent transfers to a shadow banking system when new rules are introduced. New liquidity rules will also require increased monitoring of liquidity risk, both

Chart 3
Rules on open currency positions in various countries
% of equity (blue columns) or capital base (red columns)



Sources: Data from IMF, Central Bank of Iceland.

15. It must be borne in mind, however, that the rules are based on the parent company, with the result that ceilings would have a limited impact if capital movements within a group were unrestricted.

by FME and the Central Bank, which is entrusted by law with setting liquidity rules. Attention must be given to those institutions and enterprises which are systemically important, adapting the rules and general supervision to this. The possibility should be considered of making different demands of market actors e.g. depending upon their balance sheet size.

It should be underlined that new liquidity rules do not replace effective and responsible liquidity management by financial undertakings, and strong internal quality control and external supervision. Experience has shown that data gathering on the breakdown of liquid assets can be improved and the Central Bank must be able to enforce reporting requirements and other monitoring. It is not sufficient to specify access to liquid funds by asset classes and maturities, assessment is also needed of how secure access is to liquid funds if this is tested in an emergency. In the following section ideas on FX liquidity rules are discussed.

Introduction of Basel III rules

As mentioned previously, Basel III rules introduce two new liquidity ratios. The liquidity coverage ratio (LCR) is intended to ensure that financial institutions can withstand a major outflow for 30 days, while the net stable funding ratio (NSFR) is intended to ensure stable long-term funding. It is desirable to set stricter rules in Iceland for liquidity and monitoring of liquidity in individual currencies than are proposed in Basel III, especially with regard to NSFR. Generally speaking, liquidity rules in Iceland should set strict limits on overall FX maturity mismatch.

Rules on liquidity in individual currencies

Currently applicable rules on liquid funds make no distinction as to whether they are in the same currencies as the liabilities. Although liquid funds are classified as to whether ISK or foreign currencies are concerned, there is no requirement that the liquidity ratio must be satisfied in each individual currency. This could be said to give a misleading picture of financial undertakings' liquidity, since a risk of liquidity shortage in a one currency could arise if a financial undertaking's access to liquid funds in this currency is significantly restricted. Liquidity rules which apply to each operating currency of a financial undertaking would also reduce the likelihood of a liquidity shortage resulting in an exchange rate dive. Central banks are lenders of last resort and providers of liquidity in times of liquidity shortage, and set rules on liquidity requirements and supervision. In Iceland the Central Bank only provides this liquidity in ISK, making it even more important that financial undertakings satisfy stricter requirements for FX liquidity. Banks will therefore be obliged to comply with rules on LCR and NSFR in their main operating currencies.

Longer time horizon for funding rules in foreign currencies

In developing rules on NSFR, special consideration must be given to the Central Bank's objective that domestic financial undertakings be able to withstand a shut down of foreign credit markets of up to three

years without requiring loans from the country's foreign currency reserves. To this end the NSFR developed must cover up to three years for foreign currencies. The intention is to have the rules ready at the end of this year and to introduce them with a transitional period in 2013.

Deposit stability, increased cost of FX deposit-taking

If there is doubt as to a lender of last resort for certain deposits, liquidity rules need to be designed so that banks can withstand a considerable outflow of these deposits in tandem with tight market conditions on global financing markets. This calls for a distinction in liquidity rules between deposits within or outside the Central Bank's currency area, depending upon whether the deposits are covered by the Icelandic Depositors' and Investors' Guarantee Fund (DIGF), and even between deposits in ISK or other currencies. It is also natural to set stricter liquidity requirements for deposits accepted in foreign branches than in domestic ones, in part because deposits gathered abroad are less stable funding due to the uncertainty of the liability of deposit guarantee funds and loans of last resort from a central bank if necessary.

Higher liquidity requirements in connection with foreign deposits increases the cost of such funding to financial undertakings. Another option which also reduces domestic banks' demand for such funding is to increase required reserves for foreign deposits.

5.3 Foreign deposits and deposit insurance

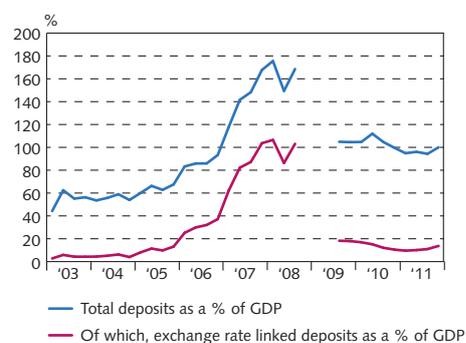
The primary role of deposit insurance is to reduce the likelihood of a deposit run and thereby encourage financial stability. It also reflects concerns of consumer protection. Such insurance, however, does create moral hazard and encourages increased risk appetite which regulatory bodies then attempt to counteract. The role of the legislator is to design a deposit insurance scheme which provides credible and real protection, and which in Iceland's case also complies with EU Directives on deposit guarantees.

When capital movements are liberalised, it will be necessary for depositors to have confidence in the protection of the deposit insurance fund, otherwise all deposits owned by non-residents, as well as those of Icelanders wishing to diversify their risk, will exit the country. The development of parent company deposits relative to GDP is shown in Figure 4. Deposits are currently almost equal to GDP. During the period 2006-2008 deposits rose from around 80% of GDP to almost 180%, of which FX deposits were equivalent to about 100% of GDP.

Existing legislation on deposit insurance

The current Icelandic legislation on deposit insurance provides a minimum guarantee equivalent to EUR 20,887 in ISK.¹⁶ The emergency

Chart 4
Deposits as a % of GDP¹



1. Customer deposits with DMBs, parent companies.
Sources: Statistics Iceland, Central Bank of Iceland.

16. Act No. 98/1999, on Deposit Guarantees and an Investor-Compensation Scheme, as subsequently amended. The Act transposed two EU Directives, firstly, Directive 94/19/EC on deposit-guarantee schemes and secondly, Directive 97/9/EC on investor-compensation schemes. A new Bill on deposit insurance would guarantee a maximum equivalent to EUR 100,000 in ISK, which complies with the existing EU Directive on deposit insurance.

legislation adopted in the autumn of 2008 gave deposits priority in liquidation and authorised the DIGF to reimburse the value of a deposit in ISK, regardless of whether the deposit was originally in another currency.¹⁷ In May 2011 the Act on Deposit Guarantees was amended with the addition of a Temporary Provision on contributions in 2011 to a new division of the DIGF.¹⁸ This specified, among other things, that contributions to the division were to be paid in ISK and the same would apply to payments from the division.

State guarantee of deposits

Following the banking collapse in the autumn of 2008, the Prime Minister issued a statement that “The Government of Iceland underlines that deposits in domestic commercial and savings banks and their branches in Iceland will be fully covered. Deposits applies to all deposits by individual savers and enterprises which are insured by the deposit division of the Depositors’ and Investors’ Guarantee Fund.” In the light of the events of the time, it was considered necessary to prevent the flight of deposits from Icelandic banks while there was uncertainty concerning their future. This declaration has since been reiterated by all the governments in office. The above-mentioned guarantee has never been enshrined in law, neither in the budget nor other legislation.

Government statements providing blanket guarantees for deposits are generally intended to avoid a general bank run. They do, however, have negative side effects, making it preferable to have them for only a limited period. Such guarantees are generally considered to reduce market discipline and create considerable moral hazard. It is important to remove such blanket deposit guarantees as soon as circumstances permit, referring instead to the deposit guarantees of the new DIGF.

Currency of reimbursement for insured deposits

A new Act on the DIGF must provide a clear authorisation for the Fund to reimburse the value of deposits in ISK, regardless of whether they were originally in another currency. Such an authorisation would impact the supply of foreign deposits available to Icelandic financial undertakings, which would accord with the objective of substantially limiting their deposit-taking abroad.

Priority of deposits in liquidation

The ranking of deposits in priority in the winding-up or liquidation of financial undertakings varies in different countries, cf. Table 2. As has previously been pointed out, the emergency legislation, and subsequently the Act on Financial Undertakings, ensured priority of deposits over general claims. The Bill on Deposit Insurance which was submitted to the last legislative session stated that deposits would continue to

17. Act No. 125/2008, on the Authority for Treasury Disbursements due to Unusual Financial Market Circumstances etc.

18. Act No. 55/2011, amending Act No. 98/1999, on Deposit Guarantees and an Investor-Compensation Scheme, as subsequently amended.

be priority claims. The DIGF takes over the priority claims of depositors in return for reimbursement. Thus the above-mentioned arrangements favour the Fund and increase the likelihood that it will be able to fulfil its obligations. To safeguard the interests of the new DIGF and facilitate its market funding, the possibility could be considered of limiting the priority of deposits upon liquidation to the maximum deposit guarantee amount.¹⁹

Table 2. Priority ranking of deposits

Country	Priority of deposits	Additional details
Australia	Yes	The DIGF has priority, other deposits are ranked next with priority over general creditors.
US	Yes	
Brazil	No	
Bulgaria	Yes	Uninsured deposits have priority over general claims.
Chile	Yes	
Hong Kong	Yes	Insured deposits have priority.
Japan	No	
Canada	No	Deposits are general claims.
Mexico	Yes	
Russia	Yes	
Singapore	Yes	The DIGF has priority, followed by covered claims and then other deposits.
Turkey	Yes	Insured deposits have priority.
Germany	Yes	Deposits have priority over covered and general claims.

Source: International Deposit Insurance Survey. International Association of Deposit Insurers, 2008.

Limits on covered bonds issuance

According to the Act on Covered Bonds, they enjoy a security interest in the assets in an asset pool if the issuer's estate is placed in liquidation.²⁰ Covered bonds thus have priority ranking over priority claims such as wages and deposits. As a result of this arrangement, covered bonds are an extremely secure investment option and their interest terms reflect this. If the banks finance themselves with covered bonds to a major extent, this can erode the priority of deposits, since less of the banks' assets would fall to the DIGF in a financial setback. Setting a ceiling for the share of covered bonds in total funding could be considered, in order to protect the interests of priority claims.

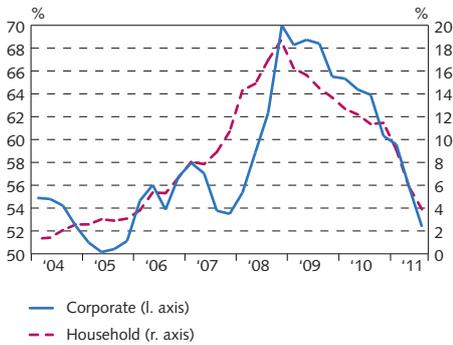
Authorisation to accept deposits in foreign branches

Over the longer term, deposits are generally considered to be relatively stable funding. This is true as long as depositors have a normal, long-term business relationship with a DMB and trust prevails, i.e. in the DMB, the currency and the deposit insurance scheme. As examples have shown, FX deposit-taking in foreign branches can prove very unstable. The Central Bank therefore emphasises that FME should not authorise domestic banks to accept deposits in foreign branches. Ac-

19. Deposits of a maximum equivalent to EUR 100,000 in ISK.

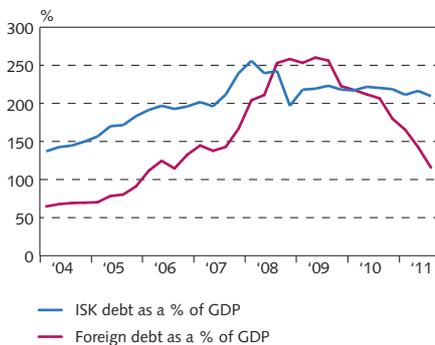
20. The nature of the security interest and enforceable rights of covered bonds is provided for in the rules of Art. 111 of the Act on Bankruptcy etc. Claims for deposits in accordance with the Act on Deposit Guarantees and an Investor Compensation Scheme are among the claims which enjoy priority with reference to Art. 112 of the Act on Bankruptcy etc.

Chart 5
Household and corporate FX loans as % of total lending



Source: Statistics Iceland, Central Bank of Iceland.

Chart 6
ISK and FX loans as a % of GDP



Sources: Statistics Iceland, Central Bank of Iceland.

tions to prevent this can be taken on the basis of the Act on Financial Undertakings, with reference to the fragility of the deposit insurance system and the fact that the largest commercial banks are systemically important, and the DIGF could not cope with the failure of any of them without substantial state assistance. Any deposit-taking abroad in the future would therefore have to be in foreign subsidiaries and guaranteeing such deposits would fall completely to the DIGF of the respective country. Another option would be to set considerably higher liquidity requirements for foreign deposits, as mentioned above.

Bill of legislation on deposit insurance

During the last legislative session the Minister of Economic Affairs submitted a Bill for new legislation on deposit guarantees and an investors' guarantee scheme.²¹ The Economic and Trade Committee discussed the Bill for some time, but it did not complete parliamentary procedure. The Bill provided, among other things, for a maximum deposit guarantee equivalent to EUR 100,000 in ISK, to shorten the payout delay to 20 days (much shorter than the normal deadline for lodging claims under the Act on Bankruptcy) and to increase the size of the fund to a minimum of 4% of total deposits (instead of the current 1% minimum). Projections assume that the 4% level would not be reached until around 2020. Furthermore, it was proposed that payments to the fund be based on the deposits and risk level of DMBs, in addition to which the definition of secured deposits was narrowed from that of current legislation. The provision of the emergency legislation authorising the fund to repay the value of a deposit in full or in part in ISK, regardless of whether it was originally in another currency, was also included in the Bill, together with clauses to codify the existing priority of deposits of upon liquidation. The Bill stated specifically that the DIGF would not enjoy a state guarantee of its obligations, in the understanding of the Act on State Guarantees. Like the current legislation, it authorised borrowing by the Fund's Board of Directors should its assets prove insufficient for minimum coverage. In its comments in 2010, the Central Bank supported in the main the Bill for a new Act on deposit insurance.²²

5.4 Limits on foreign borrowing by domestic parties without FX income

Exchange rate linked lending growth

From 2003 to 2006 the Icelandic banks' funding was transformed. Their balance sheets ballooned and they issued great quantities of bonds on markets abroad. From 2006-2008 they then began accepting deposits abroad on a large scale. The banks' easy access to relatively inexpensive overseas funding promoted their growth abroad and

21. Bill of Legislation on Deposit Guarantees and an Investor Compensation Scheme, Item 237 of the 139th Legislative Session. The Bill was, among other things, based on EU Directive 2009/14/EC on deposit guarantee schemes. The EU is currently preparing a new Directive on deposit guarantee schemes, with the principal objectives of simplification, harmonisation, a still shorter payout delay, increased authorisation for guarantee funds to gather information from DMBs and more secure financing of schemes.

22. See comments by the Central Bank of Iceland on the Bill of Legislation on Deposit Guarantees and an Investor Compensation Scheme, Item 237 of the 139th Legislative Session.

at the same time played a role in the major lending boom which took place in Iceland. The increase was first in exchange rate linked corporate loans. Exchange rate linked loans to households were at first limited to automobile financing, but from mid-2007 onwards exchange rate linked housing mortgages increased. At year-end 2003, exchange rate linked household lending amounted to around ISK 8.3 billion, or around 1% of total household debt to credit undertakings, but by the end of September 2008 the figure was ISK 320 billion or some 17% of total household debt. Exchange rate linked household borrowing thus increased almost 40-fold in a brief span, with the greatest share of this growth in 2007-2008 (Figure 5).

Export industries, with a major share of their income in foreign currencies, have long held foreign currency debt. The granting of exchange rate linked credit to corporates with ISK income and to Icelandic households resulted both from the supply of and demand for foreign financing. In part this was financing for investment abroad and in part carry trade transactions. Corporate and household demand grew in tandem with a growing interest rate differential, despite the increased risk of exchange rate depreciation. The increased inflow of capital strengthened the ISK, temporarily boosting purchasing power and further increasing debt appetite.

As Figure 5 shows, corporate loans linked to or granted in foreign currencies averaged 50-60% of total corporate lending. Not until 2007 and 2008 did they exceed 60%, peaking at 70% at year-end 2008.

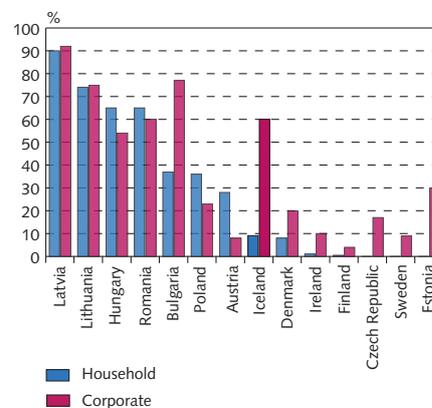
Main risks and possible regulatory measures

Currency risk develops when loans are taken in a currency other than the assets they are to finance or the income flow to be used for repayment.²³ A drop in the exchange rate of the home currency raises the principal of foreign loans in terms of the home state currency, resulting both in higher instalments and interest payments and, in turn, increased likelihood of default or credit loss. This furthermore erodes balance sheets, since equity shrinks in accordance with the rise of the underlying loans. A negative equity position can make it difficult for households and businesses to sell assets, again increasing the likelihood of default and loan losses for credit institutions.

Currency risk always exists when parties who lack income which keeps pace with a foreign currency take FX loans, but it tends to increase with the higher real exchange rate of the home currency and accordant higher likelihood of a depreciation. In 2007 the ISK real exchange rate rose considerably, to an historically very high level. In spite of this, exchange rate linked lending grew substantially that year.

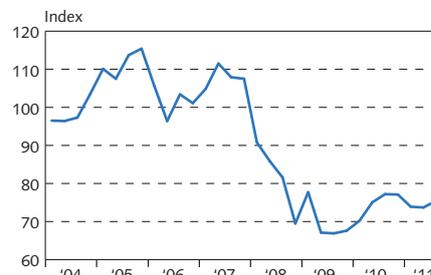
Even if the FX position on financial undertakings' balance sheets appears to be in balance despite FX borrowing and lending activities, their credit risk may be underestimated towards borrowers with income in domestic currency. Although the borrower bears the currency risk this can be transferred to the financial undertaking if the borrower ends up in payment difficulties, as experience in Iceland clearly dem-

Chart 7
FX loans as % of total lending
April 2011



Sources: European Systemic Risk Board, Central Bank of Iceland.

Chart 8
Real exchange rate (RER)



Source: Statistics Iceland, Central Bank of Iceland.

23. This is not the case if the cash inflow develops in line with the foreign currency.

onstrates. The likelihood of credit losses and defaults is considerably higher for borrowers with FX loans and income in domestic currency (Walley & Dübel, 2010). Financial undertakings are therefore actually only converting currency risk to credit risk when they make FX loans to parties with income in domestic currency, without reducing the overall risk to the financial undertaking. The currency risk, which was transferred from financial undertakings to households and businesses, remains unchanged for the economy as a whole.

If the option of granting companies, individuals and public bodies FX loans is to be available, Acts, rules and supervision have to ensure that the risk to borrowers, lenders and the economy as a whole is limited and acceptable. Ideas for prudential regulation and instruments are set out below. An assessment is also given as to which instruments should be applied and what rules can be adopted to limit the risk of households, businesses and local authorities.

LTV ratios: tighter requirements for FX loans

Ceilings on LTV, especially of housing mortgages, are an effective tool to ensure that borrowers' equity remains positive, which means that the collateral behind each loan will be sufficient. Many states have adopted rules on such maximum percentages for both domestic and foreign currencies with good results (Igan & Kang, 2011).

If FX lending to parties without natural hedges is allowed, such loans could be limited through LTV. It is quite possible to have different LTV ratios for ISK and FX loans, reflecting the difference in the risk on these loans. Such ceilings on FX loans should apply to borrowers without FX assets or income to ensure the stability of their balance sheets and cash flow. The reference ratio could even vary, e.g. when the real ISK exchange rate was high, the ratio could be lower whereas when the real exchange rate was lower the LTV could be raised.

Table 3. Maximum LTV of housing mortgages

<i>FX housing mortgages</i>	<i>Maximum LTV</i>
Latvia	90% LTV, but a ratio of 70-80% considered more desirable.
Ukraine	Prohibition against FX loans.
Hungary	60% LTV for EUR loans and 45% for other currencies.

Source: European Systemic Risk Board (2011).

Debt to Income (DTI) ratio: stricter requirements for FX loans

Ceilings on the ratio of debt service on foreign currency loans to disposable income (Debt to Income, or DTI) limit individuals' leveraging possibilities. In Iceland, individual loan applicants must pass a credit assessment, including a check of their debt service compared to income, although no official DTI has been issued. In the case of FX lending, it must be ensured that borrowers can withstand fluctuations in payments and, in particular, that borrowers with ISK income can withstand considerable exchange rate weakening. Credit assessment for FX borrowers therefore would have to be more stringent than for ISK loans. One possibility would be for regulators to issue guidelines on the DTI ratio for FX loans or adopt actual rules thereupon.

Interest subsidy only on ISK loans

Interest paid on housing mortgages is currently partly subsidised on certain conditions. The possibility could be considered of restricting general interest subsidies to homebuyers to ISK loans.

Other possible routes

In addition to the above prudential rules, three measures could be mentioned which have been adopted in other countries. Firstly, there are conversion options, as in some countries where FX borrowing is common, FX loans can be converted to domestic currencies when there is a risk of the borrower's equity turning negative and/or to ensure the adequacy of collateral. This option has given good results where it has been available (Walley & Dübél, 2010; ESRB 2011). Such conversion, however, can cause difficulties for financial undertakings with regard to foreign currency balance and FX liquidity management, and for this reason may not be suitable. In the second place, there is the option of conditional limits on FX lending. Experience in Iceland and abroad shows that demand for FX loans increases when the domestic currency strengthens, precisely when the risk they involve is greater. It would therefore be conceivable e.g. to set limits on FX loans, or prohibit them entirely, when the real exchange rate is high. Another option would be to limit specifically lending linked to currencies which fluctuate strongly against the ISK. It could be mentioned, for instance, that loans in CHF or JPY are discouraged in Hungary and Poland. Finally a surcharge could be levied on top of the normal interest rate and risk premium. This would be an adjustable charge which could reflect the interest margin between the loan currency and the ISK. It would thereby make FX loans less desirable. This has been tried in New Zealand (cf. Reserve Bank of New Zealand, 2006).

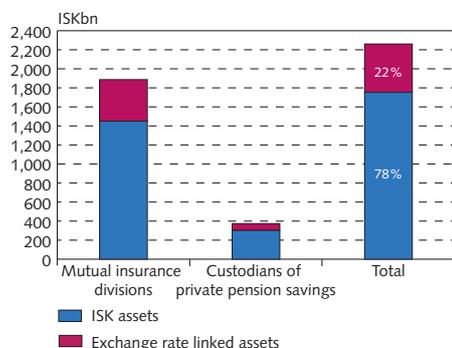
Households and corporates

Restrictions or even a ban on FX borrowing, unless households fulfil the requirements listed below, would reduce the risk of households and financial undertakings, and thereby increase financial stability and reduce imbalances in the economy.

- If both their income and assets²⁴ are in foreign currency, the parties concerned have natural hedges and are therefore at less risk holding FX debt than debt in ISK.
- If a party has only FX income, i.e. its assets are in ISK, it could be said to be hedged against changes in debt service but not against balance sheet disequilibrium. A sharp ISK depreciation could therefore wipe out equity, as debts would increase more than assets in ISK terms, or even result in negative equity. In such instances strict rules on LTV would be required to ensure that despite a sizeable exchange rate drop the party's equity would remain positive.
- If only assets were in foreign currency, FX borrowing would not result in balance sheet disequilibrium, but an imbalance in income and payments. A major ISK exchange rate decrease would therefore increase debt service but equity would be unaffected.

24. Assets at least equal to the FX debts.

Chart 9
Assets of Icelandic pension funds and
custodians of supplementary pension savings
End of year 2011



Sources: Financial Supervisory Authority (FME), Central Bank of Iceland.

Local authorities

As long as the income of local authorities is in ISK, FX debts can always cause payment difficulties. In Norway, Sweden and Denmark local authorities are prohibited from acquiring FX debts and it is proposed here that this apply to Icelandic local authorities as well, i.e. that they will not be allowed to take FX loans unless they have income flow in a foreign currency. The same applies to households and businesses as to local authorities, i.e. limiting foreign borrowing can increase financial stability and improve the efficacy of monetary policy. It is possible, however, for local governments with substantial FX income to be authorised to owe in the same currencies as their income but normally such foreign income is in separate entities.

If a decision is taken not to allow local authorities to have a currency mismatch in their income and liabilities, consideration would have to be given to their current situation and exemptions granted for extensions to outstanding debt, at least in part. Failure to do so could result in immoderate pressure on the ISK in the FX market if all local authorities had to eliminate FX imbalances within a brief period of time.

5.5 Pension funds' foreign investments

Pension rights are earned and accumulated in Iceland through mandatory occupational pension schemes and voluntary private pension savings. Both the pension funds and custodians of private pension savings operate in accordance with Act No. 129/1997, on Mandatory Pension Insurance and Activities of Pension Funds. According to the sixth paragraph of Art. 36 of the Act, pension funds must limit their total foreign currency exposure to 50% of the fund's net assets as of 1 January 2010. The provision applies only to occupational pension schemes; there are no limits on the FX exposure of custodians of private pension savings.

Since 2008, pension funds have not invested abroad. During that time the funds' assets have increased by close to one-third. Domestic assets increased by almost half, while foreign assets shrank by 12%. The proportion of foreign assets decreased from close to 33% in November 2008 to around 22% at the end of December last year. The decrease in foreign assets is explained, among other things, by an ISK strengthening since the autumn of 2008, pension funds' participation in ISK auctions by the Central Bank of Iceland and their purchase of housing bonds, from the Avens portfolio which the Central Bank of Luxembourg and the estate of Landsbanki Íslands hf. in Luxembourg acquired upon the collapse of the Icelandic banks. As Figure 9 shows, pension funds' net assets as of year-end 2011 amounted to ISK 2,260 billion, of which foreign-denominated assets were approximately ISK 508 billion. The net assets of occupational pensions amounted to almost ISK 1,890 billion, of which ISK 437 were foreign-denominated. Custodians of private pension savings held assets of over ISK 370 billion, of which ISK 72 billion were foreign-denominated. This would mean that the occupational pensions could increase their foreign assets by around ISK 506 billion, and custodians of private pension savings by some ISK 302 billion, if the capital controls were removed. The

combined amount, ISK 808 billion, is around half of Iceland's GDP in 2011, and almost eight times its goods trade balance in the same year.

5.6 Temporary restrictions on increases to pension funds' foreign assets

In relative terms, the assets of Icelandic pension funds are among the highest in countries usually used for comparison.²⁵ Their assets are currently around 140% of GDP or around 40% of private sector debt in Iceland. Risk diversification of such a large asset portfolio is crucial. It became clearly apparent with the economic collapse that the pension funds' counterparty risk was high and their risk diversification extremely limited. Because of their size, the interests of the pension funds and the economy as a whole go hand in hand, making it important that their investment policy does not threaten financial stability. In view of the large potential outflow of pension fund assets upon the removal of capital controls, the Central Bank considers it necessary to set prudential rules on their foreign investment for the short term, to prevent excessive pressure on the ISK exchange rate as a result.

Temporary limits on how rapidly the pension funds' FX assets may increase during a specified period in relative terms would attempt to limit the possible negative impact of the funds' foreign investment. It should be borne in mind, however, that in a longer-term perspective the funds' foreign investment is crucial to ensure satisfactory risk diversification of their asset portfolios. The actual restrictions could take various forms but it is important to make every effort to prevent discrimination between funds. The main options are:

- i. Setting ceilings on pension funds' purchases of foreign assets each month or each quarter.
- ii. Setting ceilings on the proportion of contributions in excess of pension payments which could be used for investment abroad.
- iii. Minimising provisionally the authorised proportion of the pension funds' foreign assets.

The limits would subsequently be relaxed in stages

5.7 Counter-cyclical macroprudential management instruments

Other macroprudential instruments could be useful to prevent the risks arising from a free flow of capital. Levies on financial transfers and reserve requirements are potential counter-cyclical instruments which can be useful in reducing fluctuations in capital movements, thereby helping to achieve the objectives of financial stability and monetary policy. Regulators can also require financial undertakings to hold more capital to meet volatility in their capital ratios resulting from exchange rate movements.

Levies on capital movements

Authorities often impose levies on capital movements (Claessens, Keen & Pazarbasioglu, 2010).²⁶ In the 1970s, James Tobin (1978) proposed a

25. See Pensions at a Glance 2011. (OECD, 2011).

26. Most of the G-20 countries, for example, tax some capital movements.

tax on spot conversions of one currency to another, to reduce profits of FX market speculation and encourage more stable exchange rates. The Tobin tax is levied on all foreign currency transactions, thereby increasing the spread between the buying and selling rate. Since it has more effect on the net short-term return, it affects the profitability of the carry trade but, other things remaining equal, should have little effect on longer-term investment. Tobin emphasised that the tax would need to be imposed internationally, otherwise investors would direct their capital to countries which did not tax capital movements. The purpose of the tax is to discourage speculation and encourage investors to undertake growth-encouraging investments, but since it is impossible to distinguish between speculation and other FX market transactions, there is a risk of the tax also deterring effective foreign investment. A variable tax on capital movements could therefore be more suitable as a management instrument, if it were levied, e.g. when the interest rate differential between Iceland and other countries became too high, and would increase in proportion to an increasing interest rate differential.

Experience of the efficacy of a levy on capital movements is limited, as few countries have adopted it. Of the G-20 countries, only Brazil has a tax on FX transactions; Turkey abolished its tax in 2008 (Matheson, 2011). The conclusions of a study by Frank Westerhoff (2003), however, indicate that a tax on capital movements may possibly reduce volatility and distortion on FX markets and prompt speculators to desert this market. Davidson (1997) and Kasa (1999) suggest that such a tax should rather be used to prevent a financial shock by reducing an unstable inflow of capital than as a remedy in a crisis.

Many countries which have adopted a tax on capital movements levy it on specific investment by non-residents. The rate can be adjusted depending on the circumstances. In late 2009, the Brazilian government introduced a tax on capital movements to reduce carry trade transactions, prevent strong capital inflows and the resultant upward pressure on the exchange rate. The tax applies to capital inflows for equities and bonds purchases and short-term foreign borrowing. Capital inflows for investment in equities slowed following the introduction of the tax, although capital flows for fixed-income instruments were considerable. In December 2010 South Korea announced the levying of a tax on banks' foreign debts other than deposits, and a higher tax on short-term liabilities (Lim et al., 2011 and Terrier et al., 2011).

Reserve requirements

Reserve requirements can serve to reduce the volatility of capital movements and their impact on the economy even if capital transfers are unrestricted in other respects. Required reserves can be increased for FX deposits and other foreign liabilities of financial undertakings. The reserve requirements can also be applied only to new inflows and not pre-existing capital. Another option for the authorities is to stipulate a specific period during which the reserve requirements apply and if investors wish to withdraw these reserves earlier, they must pay a certain premium. Finally, varying reserve requirements can be applied to liabilities depending upon their maturity, thereby encouraging long-term funding.

The objective of actively managing banks' required reserves can vary. If the reserve requirements apply broadly to capital inflows and achieve their intended purpose, they can limit immoderate foreign indebtedness and at the same time reduce the impact a sudden turnaround in capital flow can have on the financial system and the economy.

Emerging market countries have used reserve requirements in various ways, in tandem with other macroprudential instruments. In Chile, reserve requirements were applied to foreign borrowing. This had an effect on the composition of capital inflows, boosting the proportion of long-term financing. The regulatory framework provided the Chilean Central Bank with scope to increase interest rates without increasing the inflow of capital although, on the other hand, the impact of the reserve requirements on the real exchange rate was not unequivocal. Reserve requirements were placed on inflows of foreign borrowing and portfolio inflows in Columbia, but as in the case of Chile, the main result was visible in the composition of capital inflows while the effect on their quantity and exchange rate appreciation was minimal. In times of capital surfeit in Peru, active management of reserve requirements on foreign liabilities with maturity under two years had a positive impact on the composition of foreign capital. The Central Bank of Peru justified high reserve requirements on FX deposits because of the lack of a lender of last resort in foreign currency (Terrier et al., 2011 and Ostry et al., 2011).

Studies have generally confirmed that reserve requirements can impact balance sheet composition by increasing long-term liabilities at the cost of short-term liabilities. However, whether reserve requirements reduce the overall inflow of capital, and at the same time whether they relieve pressure on exchange rates, is debatable (Terrier et al., 2011).

A tax and reserve requirements on capital transfers reduces capital for investment and raises funding costs. This may direct capital to other countries without these prudential measures, especially in the short term. It can also prompt financial undertakings and investors to seek new funding routes which the regulatory framework does not cover. This can increase the likelihood of offshore services and accumulation of off-balance-sheet vehicles which are subject to less stringent supervision. Such can result in a build-up of risk and weaknesses which may be undetected by supervision during an upswing. This must be borne in mind if either of these instruments are adopted in Iceland.

Sources

Bank for International Settlements (2008). *Principles for sound liquidity risk management and supervision*.

Bank for International Settlements (2010). *The Basel Committee's response to the financial crisis: Report to the G20*.

Central Bank of Iceland (2010). Monetary policy after capital controls. *Special Publication No. 4*.

Central Bank of Iceland (2011). The role of central banks in financial supervision. *Special Publication No. 5*.

- Claessens, S., M. Keen & C. Pazarbasioglu (eds.) (2010). *Financial sector taxation: The IMF's report to the G-20 and background material*. International Monetary Fund.
- Davidson, P. (1997). Are grains in the wheels of international finance sufficient to do the job when boulders are often required? *Economic Journal*, 107(442), 671-86.
- De Larosière, J. (chair) (2009). *The high-level group on financial supervision in the EU*. Retrieved from http://ec.europa.eu/internal_market/finances/docs/de_larosiere_report_en.pdf
- Dodd-Frank Wall Street Reform and Consumer Protection Act (2010). Public Law 111-203, 111th Congress.
- European Systemic Risk Board (2011). Recommendation of the European Systemic Risk Board of 21 September 2011 on lending in foreign currencies. *Official Journal of the European Union*, 2011/C 342/1-47.
- Igan, D. & H. Kang (2011). Do loan-to-value and debt-to-income limits work? Evidence from Korea. *IMF Working Paper*, nr. 11/297.
- International Association of Deposit Insurers (2008). *International Deposit Insurance Survey*. Retrieved from: [http://www.iadi.org/searchresults.aspx?id=99&term=International Deposit Insurance Survey](http://www.iadi.org/searchresults.aspx?id=99&term=International%20Deposit%20Insurance%20Survey). May.
- International Monetary Fund (2011). *Global Financial Stability Report: Durable financial stability: Getting there from here*. (Chapter 2, How to Address the Systemic Part of Liquidity Risk). April.
- Kasa, K. (1999). Time for a Tobin tax? Federal Reserve Bank of San Francisco, *Economic letter*, 12.
- Lim, C., F. Columba, A. Costa, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel & X. Wu (2011). Macroprudential policy: What instruments and how to use them? IMF working paper, nr. 11/238.
- Matheson, T. (2011). Taxing financial transactions: Issues and evidence. *IMF working paper*, nr. 11/54.
- OECD (2011). *Pensions at a glance 2011: Retirement-income systems in OECD and G20 countries*. Retrieved from: www.oecd.org/els/social/pensions/PAG.
- Ostry, J.D., A.R. Gosh, K. Habermeier, K. Laeven, M. Chamon, M.S. Qureshi, & A. Kokenyne (2011). Managing capital inflows: What tools to use? *IMF staff discussion note*, nr. 11/6.
- Reserve Bank of New Zealand & the New Zealand Treasury (2006). *Supplementary stabilisation instruments*. Retrieved from: <http://www.treasury.govt.nz/publications/informationreleases/monetarypolicy/ssi/ssi-report-10feb06.pdf>
- Terrier, G., R. Valdés, C. E. Tovar, J. Chan-Lau, C. Fernández-Valdovinos, M. García-Excribano, C. Medeiros, M. Tang, M. V. Martin & C. Walker (2011). Policy instruments to lean against the wind in Latin America. *IMF Working Paper*, nr. 11/159.
- Tobin, J. (1978). A proposal for international monetary reform. *Eastern Economic Journal*, 4, 153-159.
- Turner, A. (2009). *The Turner Review: A regulatory response to the global banking crisis*. London: Financial Services Authority.
- Walley, S. & H. Dübel (2010). *Regulation of foreign currency mortgage loans: The case of transition countries in central and*

eastern Europe. Retrieved from: http://finpolconsult.de/mediapool/16/169624/data/Regulation_of_foreign_currency_mortgage_loans_Jan_2011.pdf

Westerhoff, F. (2003). Heterogeneous traders and the Tobin tax. *Journal of Evolutionary Economics*, 13/1, 53-70.

Central Bank of Iceland Special Publications

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Monetary policy after capital controls. No. 4, 2010.

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The Economic and Monetary Union – EMU. No. 2, 1997.

Resolution of complaints to the Central Bank Banking Supervision in the years 1990 – 1996. No. 1, 1997.