ESTUDIOS ECONÓMICOS ESTADÍSTICOS

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N.°114 Julio 2015

BANCO CENTRAL DE CHILE

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Estudios Económicos Estadísticos del Banco Central de Chile
Studies in Economic Statistics of the Central Bank of Chile
ISSN 0716 - 2502

Estudios Económicos Estadísticos
N° 114

Studies in Economic Statistics
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FINANCIAL SECTOR ACCOUNTS: THE CHILEAN EXPERIENCE IN THEIR USE FOR FINANCIAL STABILITY MONITORING*

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Resumen

El Banco Central de Chile publica trimestralmente los balances y cuentas de flujos financieros sectoriales desde el año 2008. Estas cuentas se compilan para unidades institucionales, a partir de sus respectivos balances y estados de resultados e integran las cuentas de producción, ingresos y gastos, acumulación de capital y las cuentas financieras. Los saldos de cada una de estas cuentas, son el saldo de apertura de la cuenta siguiente, quedando así reconciliadas. Este documento describe los posibles usos de las cuentas financieras para fines de monitoreo de la estabilidad financiera, en particular en lo relativo a la evaluación del endeudamiento de los hogares, el estado de las finanzas públicas, las relaciones de préstamos a depósitos en las instituciones financieras, y la exposición sectorial en derivados.

Abstract

The Central Bank of Chile has been disseminating quarterly sectoral balance sheets and financial flows since 2008. These accounts are compiled for institutional units, based on their respective balance sheets and profit-and-loss statements. They integrate production, income and expenditure, accumulation, and financial accounts. The ending balances of the accounts, which are also the opening balances of the next accounts, are then reconciled. This document describes possible uses of the financial accounts for financial stability monitoring, particularly regarding the assessment of households leverage, public finances, loan to deposit ratios in financial corporation, and derivative exposure.

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1. Introduction

Historically, the compilation of the national accounts by institutional sector (NAIS) in Chile was implemented at an annual frequency but with frequent gaps. In 1996 the construction of an integrated economic table with a more detailed breakdown by institutional units, considering the full sequence from the current account to the capital account was implemented. The current situation, with quarterly estimates since 2008, follows the trend toward quarterly measures with publication lags of around three months in advanced economies. This has been the case for a while for example, of the quarterly accounts of the euro area institutional sectors, compiled by the European Central Bank based on data provided by the member central banks[1] and the flow-of-funds accounts of the United States Federal Reserve.[2]

The quarterly NAIS can also be used for analyzing issues related to financial stability for which requires data on the transactions and balances of the financial accounts of the different economic sectors. This was clearly illustrated during the last international financial crisis when it was possible to closely monitor the processes of asset and liability movement, together with the evolution of income and expenses, both for the economy as a whole and for individual sectors.

Finally, the quarterly NAIS offer a framework for assessing the consistency of the available data at the same or shorter frequency, specifically with regard to monetary statistics, the balance of payments, the issue of securities and finances of government.

For these reasons, in 2008, the Central Bank of Chile launched a project to compile quarterly national accounts by institutional sector (QNA-IS). This initiative rests on the past experience of the Central Bank with annual measures carried out to date by its National Accounts Department. This project benefited from knowledge on the methods and data sources used by the Bank of Spain for calculating the financial accounts. The methodological aspects are summarized in Central Bank of Chile (2011). The current note updates and expands Pérez and Henríquez (2011). The next section describes the methodology that has been in use, while section 3 presents the main results obtained to date, discussing the evolution of some key variables from 2008 to 2013. Finally, section 4 concludes by highlighting some future challenges.

[1] http://www.ecb.int/stats/acc/html/index.en.html#data
[2] http://www.federalreserve.gov/releases/z1/

2. Methodology for compiling the Quarterly National Accounts by Institutional Sector (QNA-IS)

The QNA-IS are compiled in two stages. The first stage (vertical) is based on individual financial statements or groups of institutional unit's financial statements, while the second (horizontal) involves inter-sectoral reconciliation.

With regard to the first stage, the methodology considers the analysis and classification of every balance sheet and income statement item in accordance with national account concepts and definitions, which implies affecting the accounting items to determine the national account flows or transactions as established in the System of National Accounts (SNA) recommendations. This process is used to compile the production, income, expenditure, accumulation and balance sheet accounts, ensuring that the ending balances of the various accounts—which are also the opening balance of the next account—are consistent.

The process ends with the inter-sectoral reconciliation of all the transcribed records with the national account definitions and classifications. This task permits the achievement of a unified view of the compiled information, without altering the vertical equilibrium previously constructed.

A data source hierarchy is defined for the reconciliation, both within each group of institutional units and among the different groups. The primary focus of the QNA-IS starts from the reconciled balance of the income generation account (operating surplus/mixed income). This balance is the opening balance of the allocation of primary income account which is the first account in the system calculated exclusively for the institutional sectors.

2.1 Vertical methodology: Use of financial statements

The compilation of the QNA-IS starts with the use of individual financial statements considering the groups of institutional units defined in table 1.

Table 1. Groups of institutional units[3]

Breakdown by sector to disseminate non-financial accounts	***Breakdown by sector to disseminate-financial accounts***	***Breakdown by sector to compile financial and non-financial accounts***
Financial sector	Central Bank	Central Bank
	Banks and Cooperatives	Commercial banks
		Saving and loan cooperatives
	Other financial intermediaries (OFIs)	Mutual funds
		Leasing companies
		Factoring companies
		Securitization companies
		Investment funds
		Family compensation funds
	Pension funds	Pension funds
		Unemployment funds
	Insurance companies	Life insurance companies
		General insurance companies
		Health insurance companies (Isapres)
	Financial auxiliaries	Pension fund administrators
		Stock brokers
		Securities agents
		Investment fund administrators
		Securities exchanges
		Banking support services
		Financial consulting services
General government	General government	Central government
		Local government
		Public Universities
		Mutual insurance funds
Non-financial corporations	Non-financial corporations	Public non-financial corporations
		Supervised private non-financial corporations
		Retail credit cards
		Rest of non-financial corporations
Households and NPISHs	Households and NPISHs	Households and NPISHs

Source: Authors' elaboration.

In the case of institutional sectors that are supervised, such as financial corporations and public and private non-financial corporations, data from the balance sheets and financial statements are used to achieve an integrated compilation of the QNA-IS, which implies that the net lending/net borrowing determined in the financial and capital accumulation accounts is the same. In addition, quarterly integrated account estimates are made for unsupervised non-financial corporations based on administrative records from tax declarations. This has generated a full overview of the non-financial corporations.

Given that the accounting statements of businesses or entities do not always provide the data necessary for a detailed breakdown of counterpart instruments or sectors, the financial statements are complemented with data that the supervisory organizations regularly prepare. Examples include

[3] The data sources available for each sector are listed in the appendix 1.

statistics from the Superintendence of Securities and Insurance (SVS) on the breakdown of assets held by the mutual and investment funds, statistics from the Superintendence of Pensions on the breakdown of assets held by the pension and unemployment funds, SVS statistics on financial investments for the insurance companies, and so forth.

The current and capital accumulation accounts of the general government sector are compiled using detailed budget performance data, while the financial account and balance sheets are based on financial statements. The compilation process is not integrated, this leads to differences in the balances of net lending/net borrowing determined in the financial and capital accumulation accounts.

In relation to the household sector, efforts are made to carry out quarterly estimates of the current and capital accumulation accounts. This efforts support the estimation of the main variables such as property income, consumption and saving. The financial account, in turn, integrates counterpart information.

Finally, the Rest of the World account is fully equivalent to the balance of payments and international investment position statistics prepared by the Balance of Payments Department in the Central Bank of Chile.

2.2 Horizontal reconciliation methodology

The system is closed by reconciling every transaction in the current, capital and financial accumulation, and balance sheet accounts, both within each group of institutional units and among the different groups. This process is carried out independently in two separate stages: the first involves the financial account and balance sheets, while the second concerns the current and capital accumulation accounts.

The reconciliation of the financial accounts and their respective balances is based on "from-whom-to-whom" matrices framework. These involve a disaggregation of nine institutional sectors for each financial instrument,[4] with the exception of shares and other equity as well as other accounts (receivable/payable) for which counterpart information is not yet considered for publication. The asset

[4] A breakdown of the financial instruments considered in the published financial accounts is provided in appendix 2.

and liability values for each instrument/sector cell are reconciled based on a data source hierarchy. In general, the hierarchy criteria consider households and non-financial corporations as residual sectors. At the instrument level, some of the criteria are as follows:

- *Currency and deposits (AF.21 and AF.22)*: includes liabilities of the Central Bank, commercial banks, and the Rest of the World; savings accounts are allocated as a household asset, while the remaining instruments in this category are determined based on the value of the asset and considering the non-financial sector as the residual sector.

- *Short- and long-term securities other than shares (AF.31 and AF.32)*: In general, balance sheet information is sufficient for determining the total issued by each sector, but the classification between short and long term is not very precise for either assets or liabilities. Therefore, as a support, the reconciliation process for this instrument is drawn from a security-by-security data base, an administrative record provided by the Central Securities Depository. This information allowed the construction of "from-whom-to-whom" matrices for balances (at market value), financial transactions and revaluations.

- *Short- and long-term loans (AF.41 and AF.42)*: the counterparty for long-term loans in foreign currency is assumed to be the Rest of the World. Mortgage and consumer loans are allocated to households and commercial loans to non-financial firms.

- *Pension funds (AF.61) and insurance technical reserves (AF.62)*: accounted as a liability for the pension funds and insurance companies, while it is an asset to households.

The reconciliation of the current accounts begins with the income-generation account balance, continues with the rest of the current accounts and ends with the determination of saving. The reconciliation process is analogous to that of the financial accounts. However, for this type of transactions, there is less counterpart data on institutional sectors. Consequently, sectors with no direct data are frequently assigned residual values, so the work on economic consistency in this stage is especially important for guaranteeing the quality of the results.

The reconciliation process is simpler for the capital accumulation account since data on total gross fixed capital formation, fixed capital consumption and changes in inventories are available for the

economy as a whole from the quarterly national accounts, while data are also supplied by each institutional sector. By convention, any difference between the sum of the institutional sectors and the value for the total economy is allocated to non-financial corporations.

3. Financial sector accounts: 2013 and 2008.

Figures 1a and 1b present the evolution over time and across economies of household debt as a fraction of GDP and as a fraction of financial assets held. It is significant that the degree of heterogeneity across countries is quite high, and remains high. Although leverage, when scaled by GDP, appears on average also stable, the degree of improvement in households financial situation is more apparent when scaled by financial assets. There, most of the economies show lower debt to assets in 2013 than in 2008.

The household sector[5] in Chile has specific idiosyncrasies that are quite apparent in the structure of their assets. The main financial asset held is related to life insurance technical reserves and pensions funds. From an international perspective,[6] Figure 1c shows that the composition of assets on the financial balance sheet of Chilean households is quite similar to the composition found in countries like Denmark, Holland, Sweden, United Kingdom, Switzerland, Ireland and France. All of which have a high share of pensions and insurance reserves in total financial assets.[7] In contrast, there is little similarity between the structure of the balance sheet of Chilean households and that of countries like Austria, the Czech Republic, Slovenia, Greece and so on, which have a high share of cash and deposits in their asset portfolios. This is of course related to the structure of pension systems, which in Chile rely on defined contributions and individual pension accounts, whereas in other economies the pension system follows is based on transfers and taxes, with a defined benefit structure.

Figures 2a-2c present the evolution over time and across economies of the central government financial health. Unlike certain degree of deleveraging which was apparent over the period 2008-2013 for households, most governments present higher levels of debt now than immediately during the great financial crisis. Moreover, not only debt has increased but also financial assets have been ran down. As with households, there is a significant heterogeneity across countries that persists over time.

[5] It includes non-profit private institutions serving households (NPISHs).
[6] Source of data: http://stats.oecd.org/Index.aspx?DatasetCode=SNA_TABLE710.
[7] The similarity degree was determined by correlating percentage structures in the asset portfolio of each country with respect to that of Chilean households.

The Chilean General Government sector balance sheet shows in Figure 2d large holdings of securities and deposits, consistent with the information available on sovereign funds held abroad, which are disclosed within the International Investment Position of Chile. As compared with the OECD countries, the financial asset composition of the general Government sector is similar to that of countries such as the United States, Japan and South Korea. In general, the rest of the OECD countries show a higher share of the "shares and other equity" in their assets. This fact is probably due to the higher contribution of the general Government to productive activities via the ownership of public companies. Moreover, compared to 2008, in 2013 the most striking feature has been the increased share of loans in the asset of creditor countries involved in financial assistance programs, for instance in the case of the Eurozone.

With regard to the liabilities of the general government, the issue of securities other than shares represents a larger fraction of financing as supposed to that of loans. The most notable aspect of the debt of the general government in Chile is its low share of GDP, equivalent to just 15% in 2008.

Regarding financial corporations and banks, one particular issue that has been flagged as indicative of financial vulnerabilities is the loan to deposit ratio. A low ratio is suggestive of a higher dependency of wholesale or capital market funding for loans. As Figure 3a shows, Chile displays a very high loan to deposit ratio. It has been pointed out that this reflects the particular nature of financial intermediation in Chile, with a significant role for pension funds and other institutional investors in the funding of banks. In the case of financial corporations, Figure 3b presents balance sheet statistics for the various sub-sectors, including the Central Bank, financial intermediaries, auxiliaries, insurance companies and pension funds, provide data that can be used to estimate currency and deposit holdings, as well as financial investment in securities, and shares and other equity. These show that the financial sector's asset portfolio is mainly concentrated in loans (46%) and securities other than shares (29%), while liabilities are largely made up of currency and deposits, and insurance reserves.

Several multilateral institutions (such as the IMF, see for instance the April 2015 Global Financial Stability Report), have flagged the importance of monitoring external debt of corporations, in particular if this external debt is denominated in a different currency than the assets of the firm. The subsequent potential currency mismatches could limit the ability of the economies to adjust their exchange rates. In the case of Chile, although external corporate debt is significant, a relevant part of it is linked to foreign

direct investment, or is hedged directly or indirectly. Getting a comparative perspective on this issue is quite relevant, and financial sector accounts could provide a benchmark for such cross border comparability. Specifically, as can be seen in Figure 7, the magnitude of external debt appears to increase with the degree of development.

4. Conclusions and future challenges

The magnitude and composition of agent's leverage and asset holdings is an important indicator for financial stability monitoring, and thus financial sector accounts have an important role to play in this regard. However, to complement gross and net measures in the sectoral financial accounts, timely information on who-to-whom holdings would improve the quality of assessments for financial stability.

Increased granularity in derivative exposures also would help fine tune the analysis of, for instance, foreign exchange exposures linked to non-financial corporates external debt. These challenges complement, in the case of Chile, the need to continue to strive for a more granular measurement of the accounts of non-listed and non-regulated corporations.

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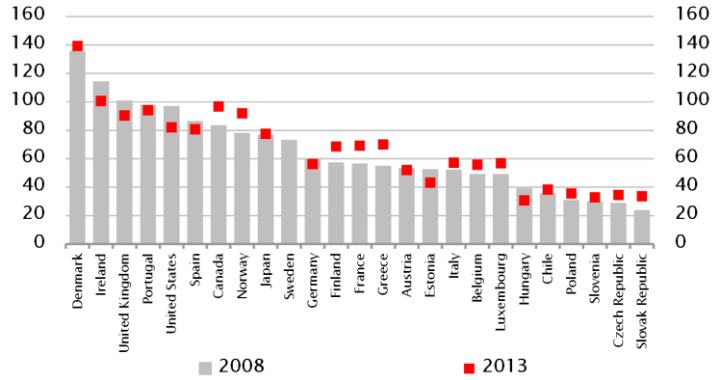
Appendix 1
Data sources by institutional sector

Sector	*Subsector*	*Source*	*Frequency/Lag*
S.12 Financial sector			
S.121 Central Bank	Central Bank	Central Bank of Chile	Monthly/30 days
S.122 Banks and cooperatives	Commercial banks	Superintendence of Banks and Financial Institutions (SBIF)	Monthly/30 days
	Saving and loan cooperatives	SBIF	Monthly/60 days
S.123 Other financial intermediaries	Leasing, factoring, and securitization companies	SBIF	Quarterly/60 days
	Family compensation funds	Superintendence of Social Security (SuSeSo)	Annual/6 months
S.126 Pension funds	Pension funds	Superintendence of Pensions (SP)	Quarterly/90 days
S.125 Insurance companies	Life insurance companies	Superintendence of Securities and Insurance (SVS)	Quarterly/45 days
	General insurance companies	SVS	Quarterly/60 days
	Health insurance companies (Isapres)	Superintendence of Health	Annual
S.124 Financial auxiliaries	Financial consulting and support services	SBIF	Quarterly/60 days
	Pension fund administrators	SP	Quarterly/90 days
	Investment fund managers	SVS	
	Stock brokers and securities agents	SVS	Quarterly/60 days
S.13 General government	Central and Local Government	Office of the Comptroller General	Monthly/60 days
	Mutual insurance funds	Superintendence of Social Security (SuSeSo)	Annual/6 months
S.11 Non-financial corporations	Supervised corporations and public companies	SVS	Quarterly/60-75-60-90 for IFRS/45 days for FECU
	Other corporations and firms	Internal Revenue Service (SII)	Annual/8 months
	Retail credit cards	SBIF	Quarterly/60 days

Appendix 2
Breakdown of published financial instruments

Financial instruments QNA-IS	
AF.1	Monetary gold and SDRs
AF.21/2	Currency and deposits
AF.29	Other deposits
AF.31	Short-term securities other than shares
AF.32	Long-term securities other than shares
AF.34	Financial derivatives
AF.41	Short-term loans
AF.42	Long-term loans
AF.51	Quoted and unquoted shares
AF.52	Mutual fund shares
AF.61	Pension funds
AF.62	Insurance technical reserves
AF.7	Other accounts receivable/payable
AF.9	Adjustments and discrepancies

Figure 1a - Households: Debt to GDP (%)



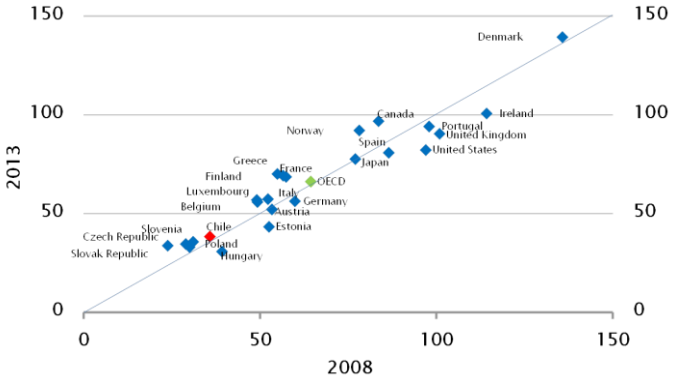
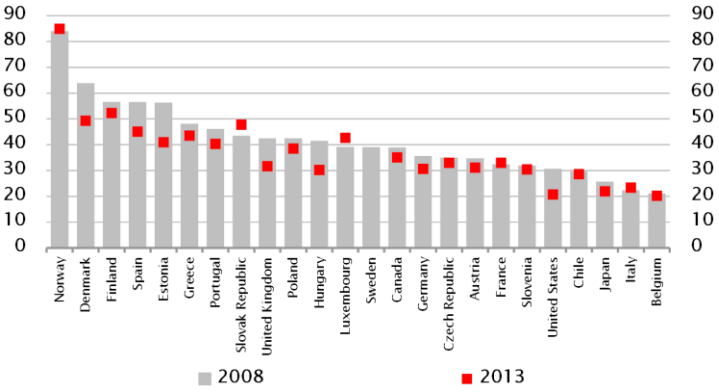


Figure 1b - Households: Debt to Financial Assets (%)



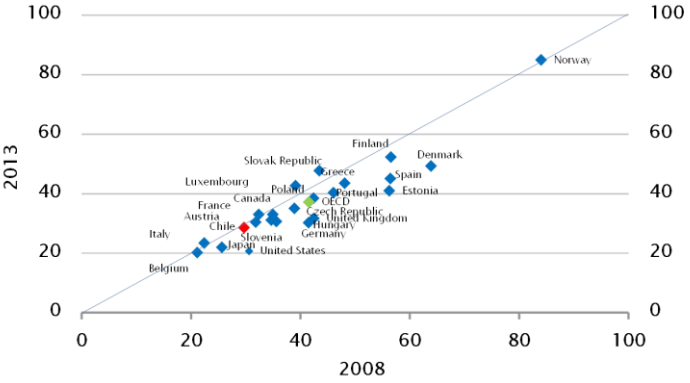
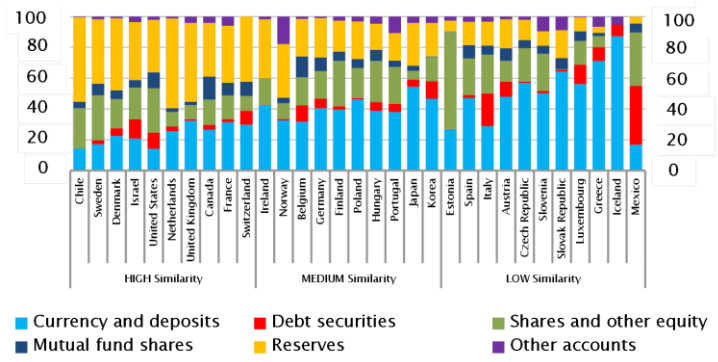


Figure 1c - Household Sector Balance Sheet. 2008



Household Sector Balance Sheet. 2013

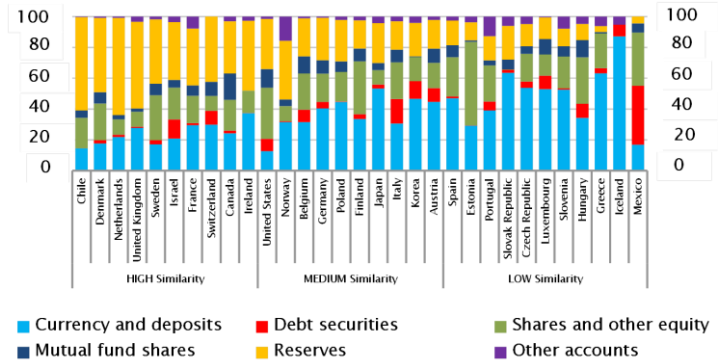


Figure 2a - General Government: Debt to GDP (%)

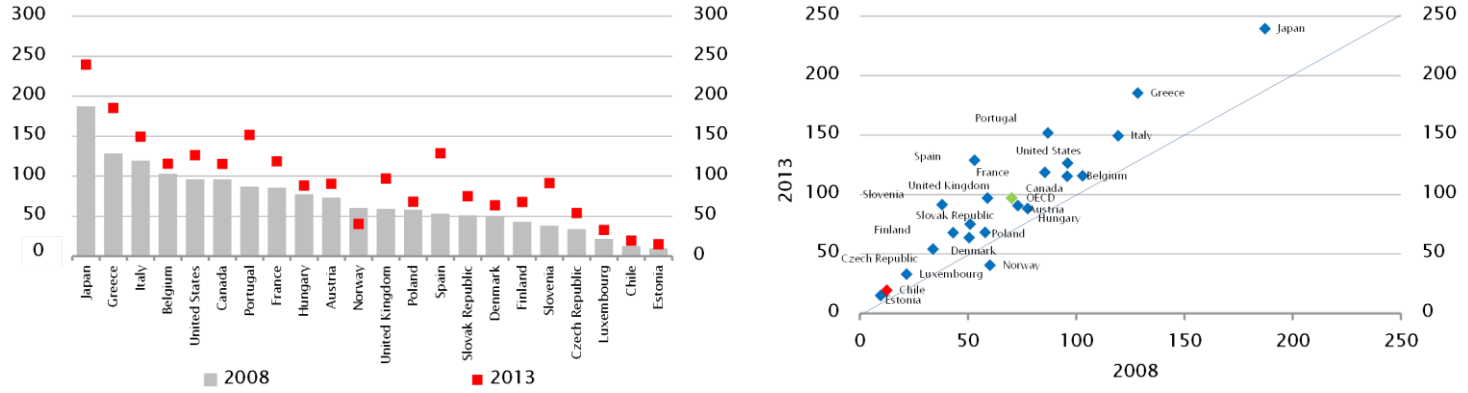


Figure 2b - General Government: Debt to Financial Assets (%)

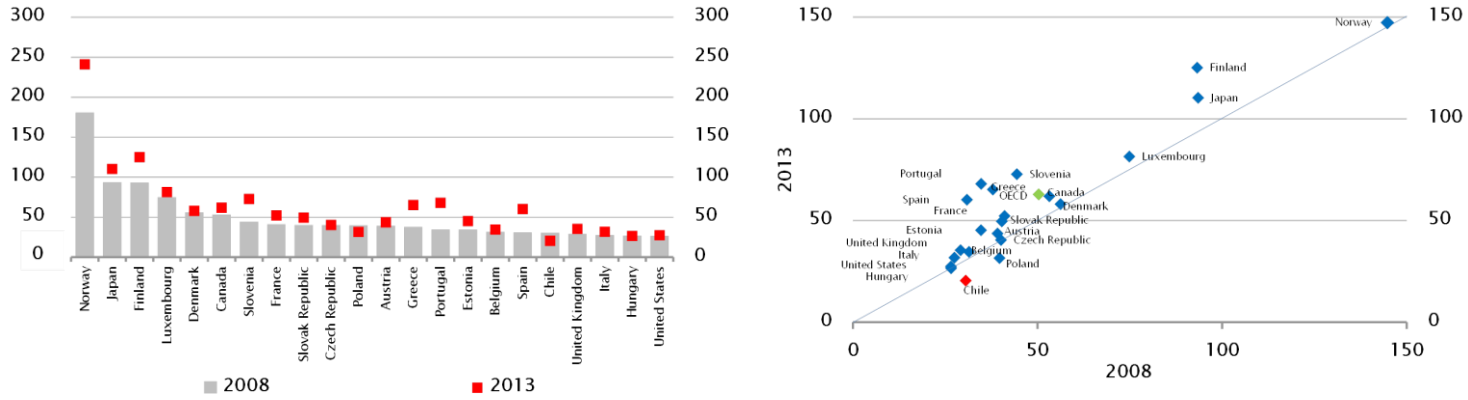


Figure 2c - General Government: Net financial assets to GDP (%)

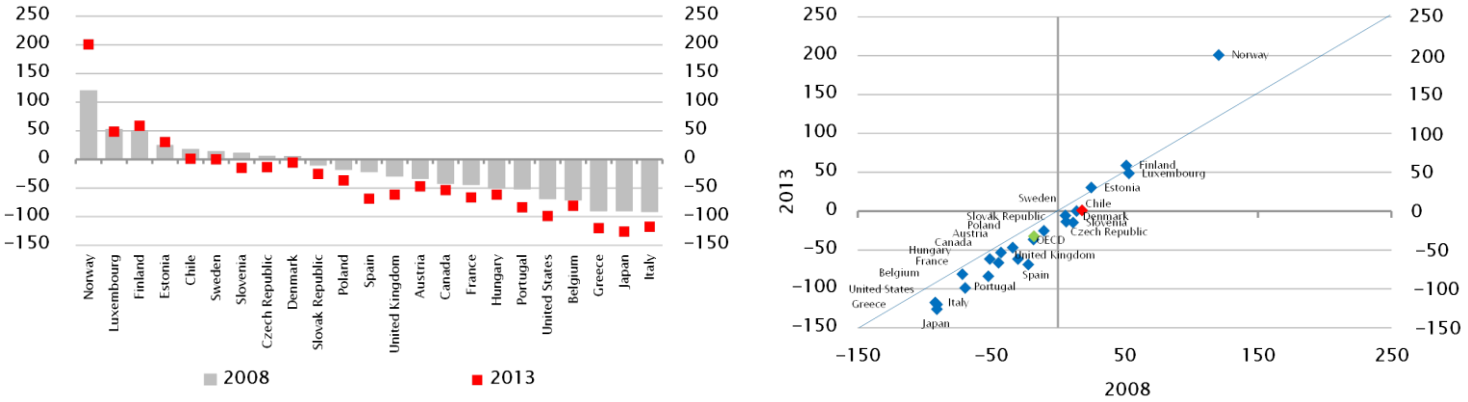
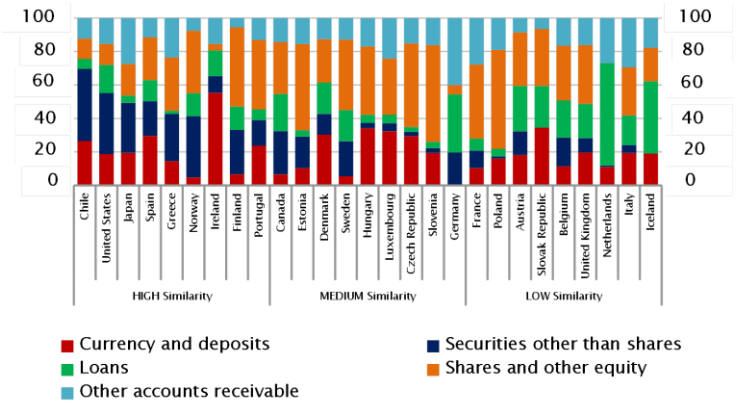


Figure 2d - General Government Sector Balance Sheet. 2008



General Government Sector Balance Sheet. 2013

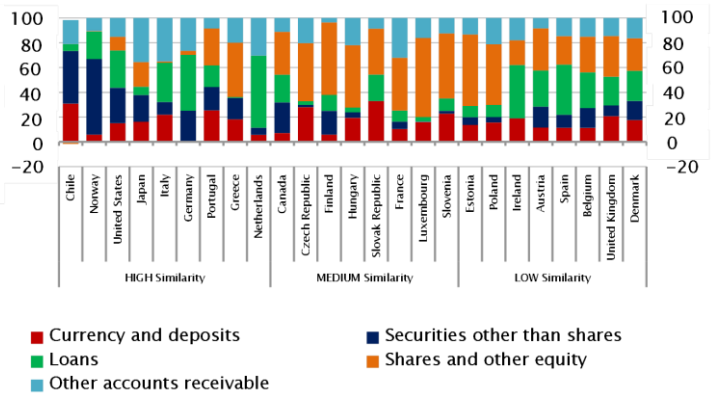
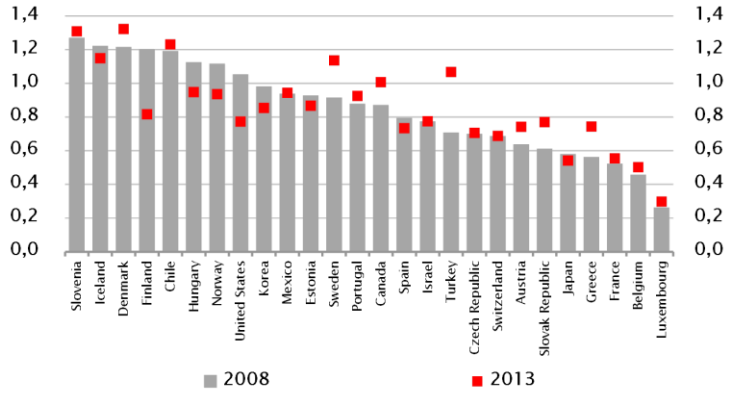


Figure 3a - Financial corporations Loan to Deposit Ratio



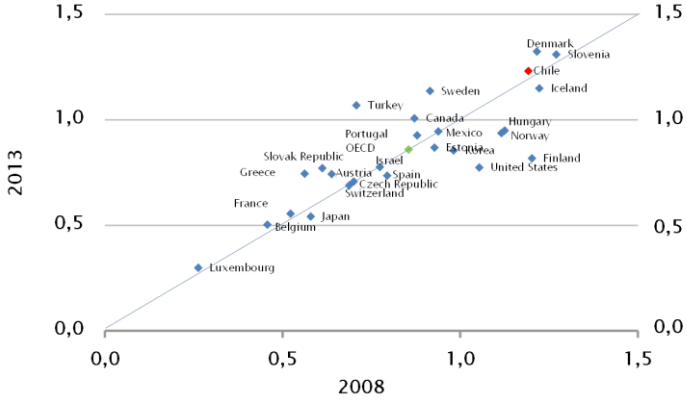
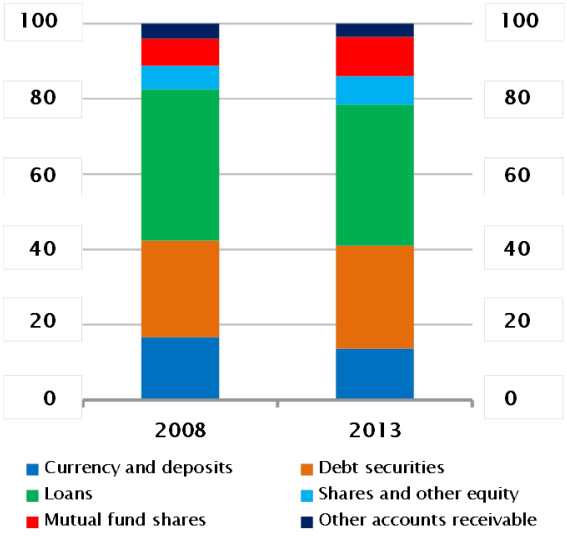


Figure 3b. Financial corporations Balance Sheet. Chile, 2008 and 2013. <u>Assets</u>



Financial corporations Balance Sheet. Chile, 2008 and 2013. <u>Liabilities</u>

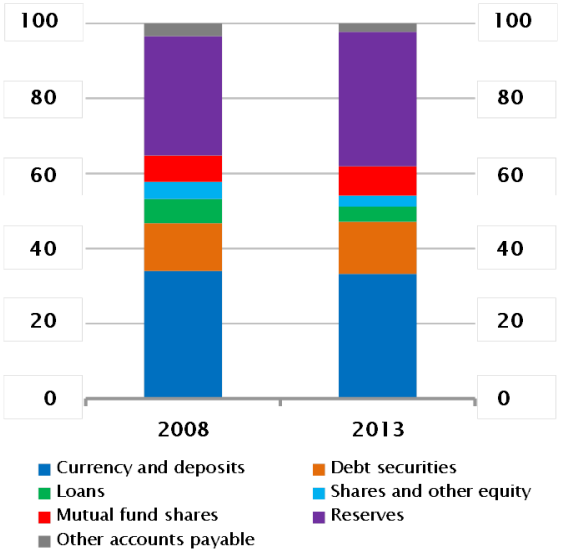
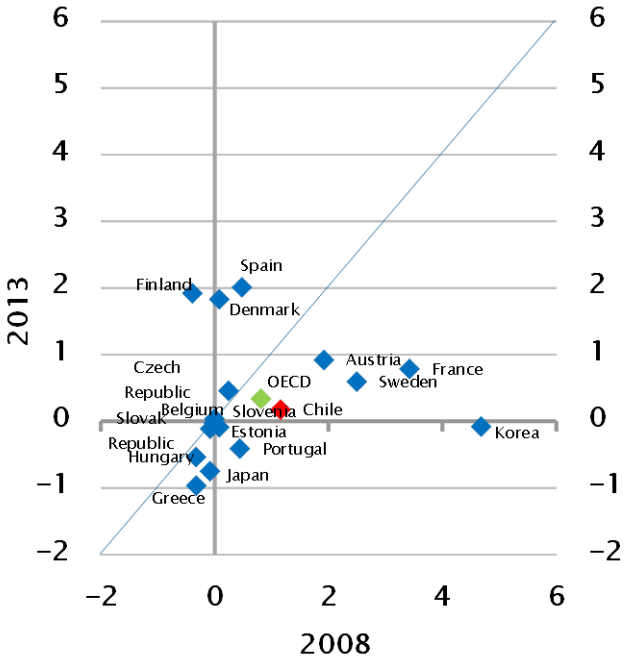


Figure 4 - Derivatives (Net Position). Financial Corporations (%GDP)



Derivatives (Net Position). Non-Financial Corporations (%GDP)

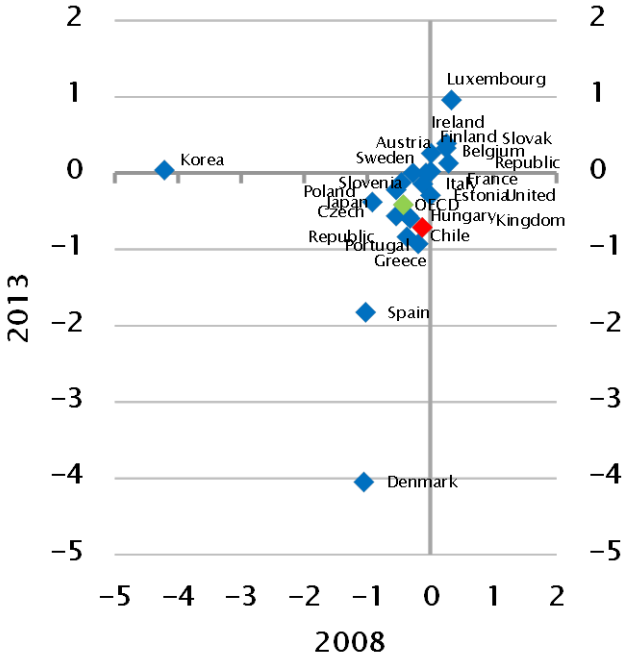
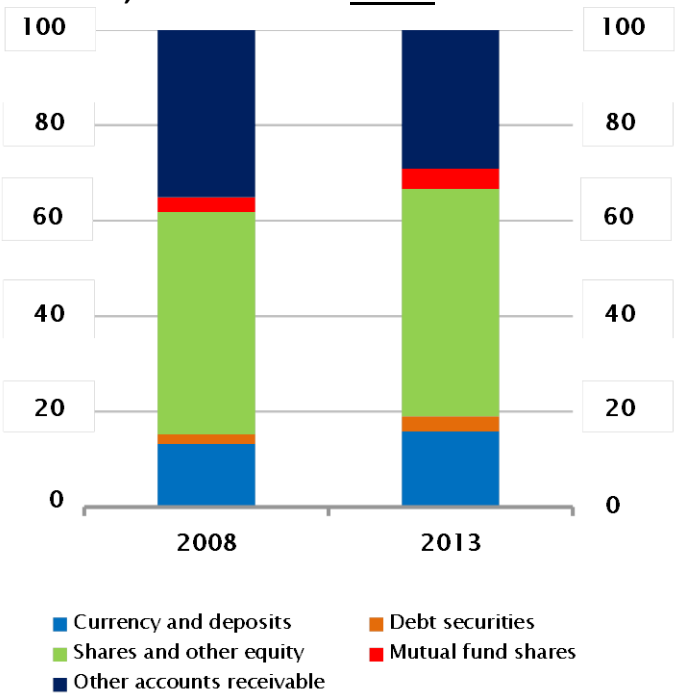


Figure 5a. Non-financial corporations Balance Sheet. Chile, 2008 and 2013. Assets.



Non-financial corporations Balance Sheet. Chile, 2008 and 2013. Liabilities.

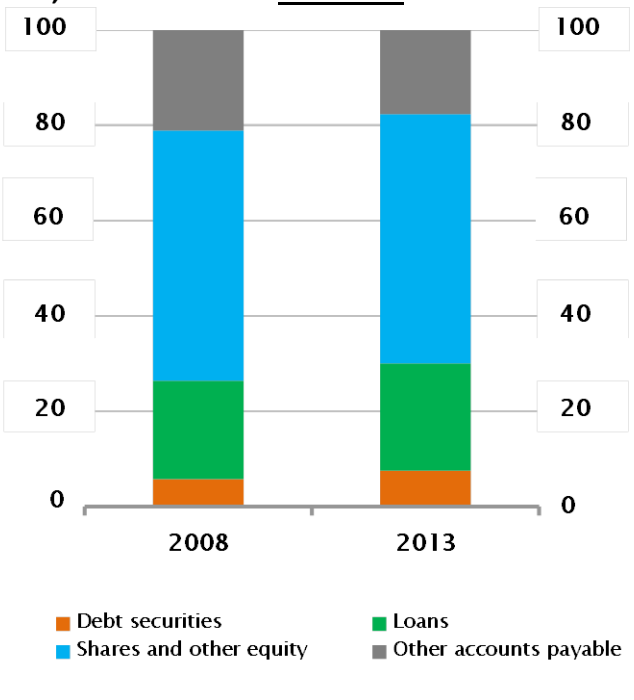


Figure 6a. Sectoral Balance Sheets, Chile. 2008 (%GDP)

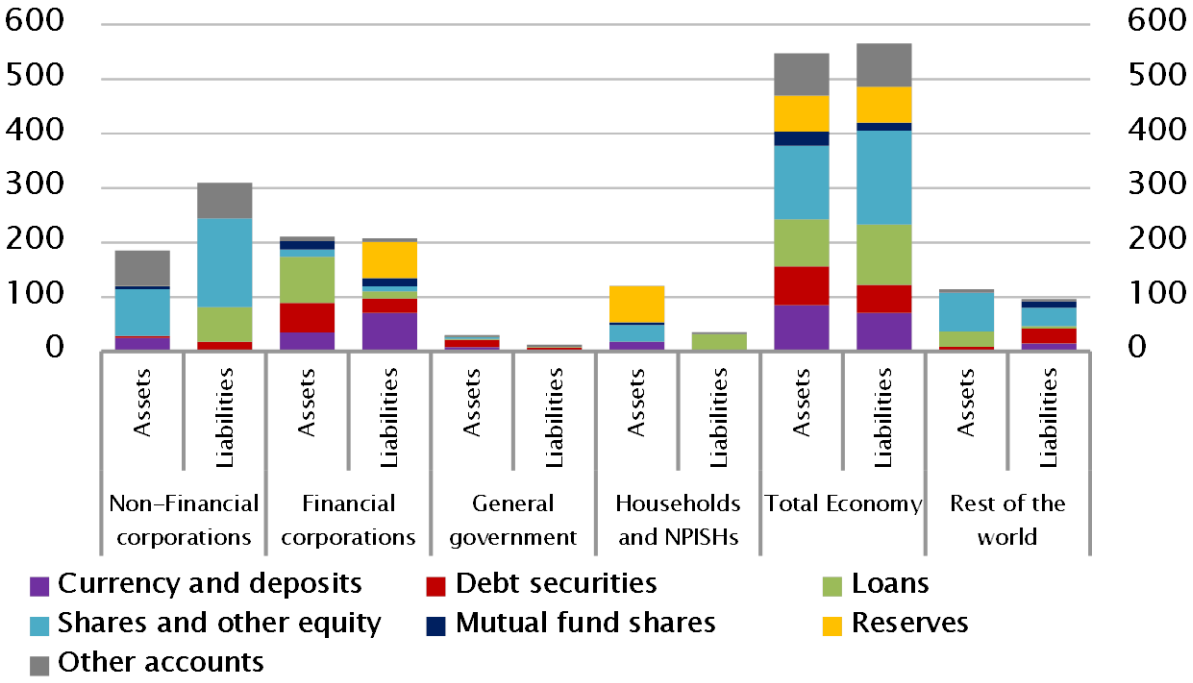


Figure 6b. Sectoral Balance Sheets 2013, Chile. (%GDP)

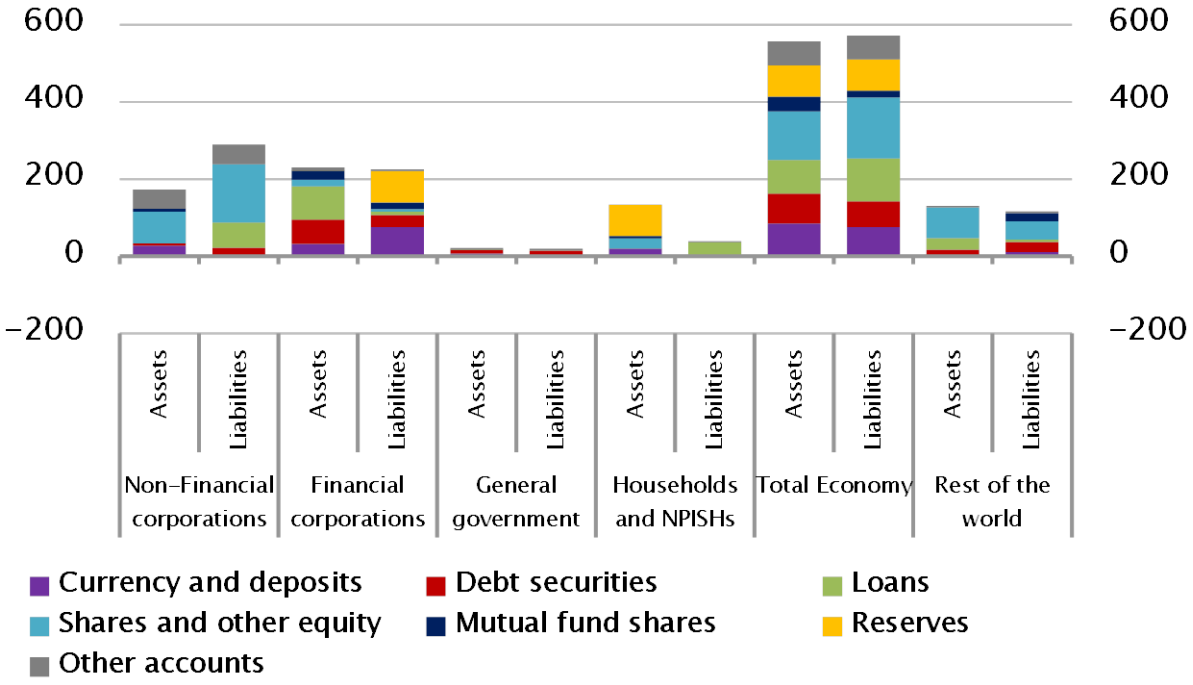
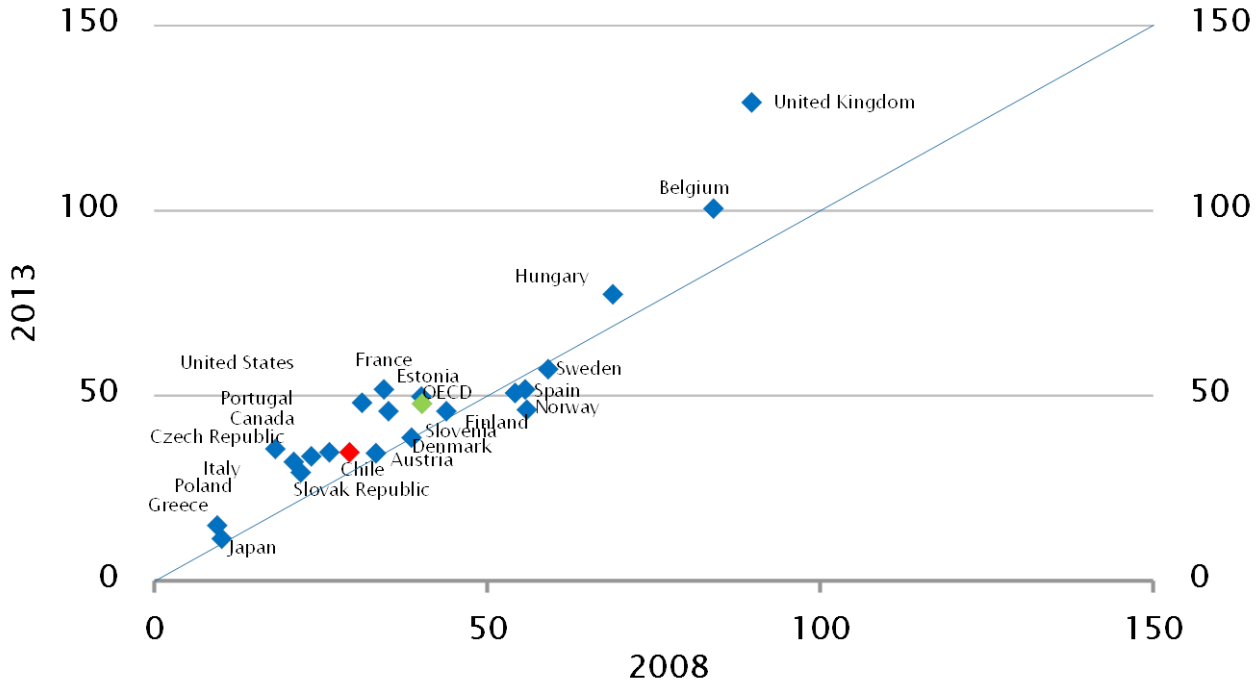


Figure 7. Non-financial corporate external debt (%GDP).
Quarterly External Debt Statistics /SDDS, World Bank.



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