



BANK ĊENTRALI TA' MALTA
EUROSISTEMA
CENTRAL BANK OF MALTA

SECTORAL FINANCIAL LINKAGES USING MALTA'S FINANCIAL ACCOUNTS

BOX 1: SECTORAL FINANCIAL LINKAGES USING MALTA'S FINANCIAL ACCOUNTS¹

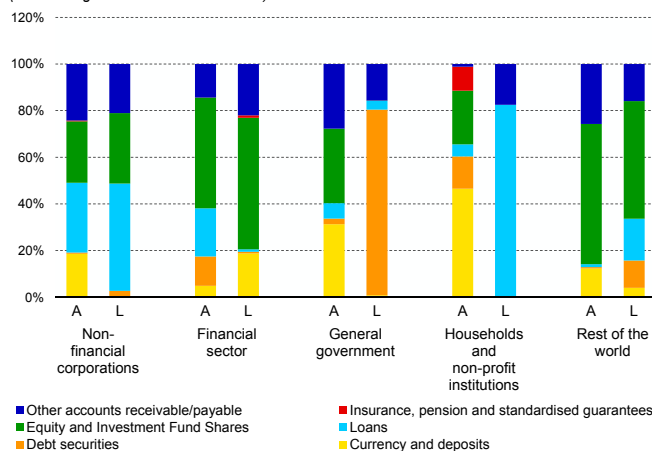
The Financial Account is an integral part of the European System of Accounts (ESA 2010) National Accounts framework.² The data within the Financial Accounts dataset, which covers all institutional sectors of the resident economy and the 'rest of the world' sector split by financial instrument, can be beneficial for policy makers and researchers as it allows them to understand the financial linkages between the institutional sectors using what is known as "from-whom-to-whom" data. Such data show the amount of financial assets and liabilities that each sector holds with other sectors. The 2008 financial crisis highlighted the importance of data on interconnectedness between sectors to identify and prevent the transmission of systemic shocks.

Since 2014 the Central Bank of Malta has published on its website the outstanding amounts of financial assets and liabilities for the main institutional sectors and a breakdown thereof by financial instrument.³ As from 2017, these website data will be complemented with the "from-whom-to-whom" data. These will enrich Malta's Financial Accounts dataset and enable broader analysis and research.

Compilation of Financial Accounts⁴

Financial accounts data are based on the principle of double entry accounting, implying that every liability is matched by a financial asset. The full set of accounts consists of stocks, flows and other changes in volume (mainly reclassifications). Such data are compiled using data collected from two parties for every financial transaction, namely the reporting sector and the counterpart sector.⁵ Since in most cases the data obtained from the two parties do not reconcile, a ranking process is needed to establish one source for each transaction. The data are compiled using the building blocks process, whereby a ranking process gives precedence to certain data according to reliability and availability. The ranked data produce the full set of financial accounts for all sectors at market prices and on a non-consolidated basis. A balance sheet covering the main financial instruments for each institutional sector can be obtained as illustrated in Chart 1.

Chart 1
SECTORAL BALANCE SHEET BY MAIN ECONOMIC INSTRUMENT
(outstanding amounts as at June 2016)



Source: Central Bank of Malta.

¹ Prepared by Janica Muscat, Economist Statistician within the Statistics Department of the Central Bank of Malta and Kimberly Mamo, an intern within the same Department. The views expressed are those of the authors and do not necessarily reflect those of the Central Bank of Malta.

² The ESA 2010 was introduced in 2014 in line with Regulation (EU) No 549/2013.

³ Pule', J. (2013), Launching of Malta's Financial Accounts Statistics. *Quarterly Review* 2013(4), Central Bank of Malta.

⁴ The compilation of Malta's Quarterly Financial Accounts is in line with the Guideline of the ECB (recast) (ECB/2013/24). The data set is also shared with the National Statistics Office. This enables the latter to meet Eurostat's statistical requirements, from which a number of Macroeconomic Imbalance Procedure (MIP) Scoreboard indicators for Malta are derived. Such data are also a requirement of the IMF's SDDS Plus data requirements. These are necessary for various other national and international requirements such as the IMF/FSB G-20 Data Gaps Initiative which were also introduced after the recent international financial crisis.

⁵ Primary data for institutional sectors are mainly collected from reporting institutions. The NSO shares balance of payments/international investment position (BOP/IIP) and Government Finance statistics with the Central Bank of Malta. Data are also estimated or obtained indirectly from counterparties, in particular those for households and non-profit institutions serving households.

Sectoral balance sheet of the Maltese Economy

A sectoral level balance sheet can be derived from Malta's Financial Accounts similar to Chart 1. This chart illustrates the outstanding amounts as at June 2016⁶ for the main institutional sectors of the economy namely, the financial sector, the general government, NFCs, households and the rest of the world (ROW) sectors, sub-divided by the main financial instruments.

The asset holdings and liabilities vary across sectors.

While the assets of the financial sector are dominated by equity due to the significant amount of holding and international companies classified within Malta's financial sector, the assets of the NFCs are much more broadly balanced between deposits, equity, loans (largely intra-sector loans) and other accounts receivable. Households hold assets primarily in deposits, including cash holdings, followed by securities. Similarly the asset composition of the general government sector mainly includes deposits, equity and other accounts receivable.

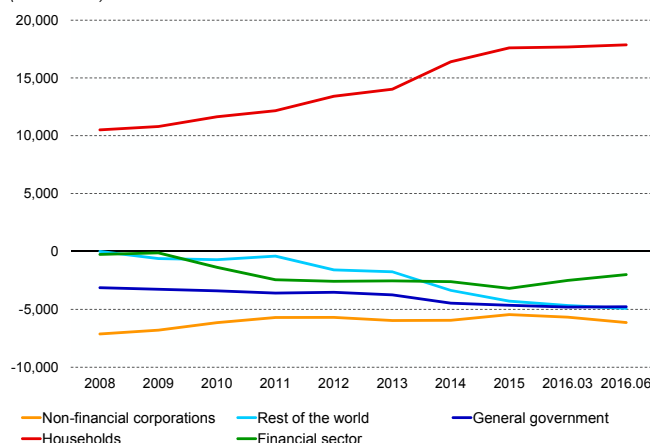
With respect to NFCs and households the main liability consists of loans. Households obtain their loans mainly from banks but NFCs borrow both from banks and from other sectors. The main liabilities of the financial sector are currency, deposits and equity, while the general government finances its activities mainly by issuing debt securities. The asset side of the ROW sector reflects the liabilities of the total resident economy with the ROW, where the dominant instrument is equity. Similarly, the liabilities side of the ROW reflects the assets of the resident total economy with the ROW.

Sectoral level balance sheet data can be used to derive the net financial wealth for each economic sector (see Chart 2). The most indebted sectors between 2008 and the second quarter of 2016 are NFCs. On the other hand, households have the highest generally positive net financial wealth, while the financial sector is close to balance given the nature of its business. The total net financial wealth sums up to approximately zero since assets are matched with liabilities.⁷

The new "from-whom-to-whom" tables

Further to the balance sheet data by sector, the Bank will henceforth be placing on a quarterly basis "from-whom-to-whom" data from the quarterly financial accounts on its website (see Tables 1 and 2).⁸ This will make it possible to analyse how changes in financial assets and liabilities in one sector of the economy are transmitted to other sectors, which lead to changes in demand for goods and services, eventually affecting economic growth.⁹

Chart 2
NET FINANCIAL WEALTH
(EUR millions)



Source: Central Bank of Malta.

⁶ Cut-off date for the data was 2 December 2016.

⁷ The only exception is for monetary gold as no counterparty data is statistically reported.

⁸ Tables 1 and 2 shown in this article are concise versions of the "from-whom-to-whom" data that will be published on a quarterly basis on the Central Bank of Malta website. It will also include further breakdowns by sector.

⁹ Ruppercht, M., "Who-to-whom information in German financial accounts – compilation, challenges and its usefulness for monetary policy", *Deutsche Bundesbank Working Paper*, 2015.

The point of view of the asset holder split by instrument and counterpart sector is shown in Table 1, while Table 2 provides the point of view of the borrower, also split by instrument and counterpart sector. Data are on a non-consolidated basis hence intra-sector positions are included. Sector and instrument classifications are in line with ESA 2010.¹⁰

Table 1
NON-CONSOLIDATED FINANCIAL ASSETS BY COUNTERPARTY (FROM-WHOM-TO-WHOM)^(1,2)

EUR millions

Borrowers Holders	Non-financial sector	Financial sector	General government	Total economy	Rest of the world	Total
Non-financial sector	13,819	24,255	2,819	40,894	4,286	45,179
Currency	0	750	0	750	0	750
Deposits	0	13,397	0	13,397	1,025	14,422
Debt securities	379	837	2,018	3,235	229	3,464
Loans	7,056	183	18	7,257	258	7,516
Equity and Investment Fund Shares	3,938	6,343	0	10,282	815	11,096
Insurance, pension and standardised guarantees	0	2,578	0	2,578	0	2,578
Other accounts receivable	2,446	167	782	3,395	1,958	5,353
Financial sector	10,608	8,252	4,892	23,752	218,957	242,709
Monetary gold and SDRs	0	6	0	6	110	116
Currency	0	173	0	173	0	173
Deposits	0	3,545	70	3,615	7,876	11,491
Debt securities	142	184	4,286	4,611	26,003	30,614
Loans	8,752	1,718	103	10,573	39,573	50,146
Equity and Investment Fund Shares	1,031	2,187	0	3,218	111,993	115,210
Insurance, pension and standardised guarantees	0	1	0	1	0	1
Other accounts receivable	683	438	434	1,555	33,402	34,957
General government	1,283	1,727	140	3,150	579	3,729
Currency	0	0	0	0	0	0
Deposits	0	1,166	0	1,166	0	1,166
Debt securities	0	0	90	90	0	90
Loans	20	0	5	25	222	247
Equity and Investment Fund Shares	536	557	10	1,103	88	1,191
Insurance, pension and standardised guarantees	0	0	0	0	0	0
Other accounts receivable	727	4	35	765	270	1,035
Total economy⁽³⁾	25,710	34,235	7,851	67,795	223,822	291,617
Monetary gold and SDRs	0	6	0	6	110	116
Currency	0	924	0	924	0	924
Deposits	0	18,109	70	18,178	8,901	27,079
Debt securities	521	1,021	6,394	7,935	26,232	34,168
Loans	15,828	1,901	126	17,855	40,053	57,909
Equity and Investment Fund Shares	5,505	9,087	10	14,603	112,895	127,498
Insurance, pension and standardised guarantees	0	2,579	0	2,579	0	2,579
Other accounts receivable	3,856	609	1,251	5,715	35,630	41,345
Rest of the world	7,754	210,480	660	218,894	0	218,894
Currency	0	0	0	0	0	0
Deposits	0	26,934	0	26,934	0	26,934
Debt securities	212	726	382	1,320	0	1,320
Loans	1,895	604	194	2,693	0	2,693
Equity and Investment Fund Shares	2,685	128,935	0	131,620	0	131,620
Insurance, pension and standardised guarantees	0	0	0	0	0	0
Other accounts receivable	2,962	53,280	85	56,327	0	56,327
Total⁽⁴⁾	33,463	244,715	8,511	286,689	223,822	510,511
Monetary gold and SDRs	0	6	0	6	110	116
Currency	0	924	0	924	0	924
Deposits	0	45,043	70	45,112	8,901	54,013
Debt securities	733	1,747	6,776	9,255	26,232	35,488
Loans	17,723	2,505	320	20,548	40,053	60,601
Equity and Investment Fund Shares	8,190	138,022	10	146,223	112,895	259,118
Insurance, pension and standardised guarantees	0	2,579	0	2,579	0	2,579
Other accounts receivable	6,818	53,889	1,336	62,043	35,630	97,673

⁽¹⁾ As at June 2016.

⁽²⁾ Data is in line with ESA 2010 and on a consolidated basis. Hence intra sector positions are included.

⁽³⁾ The total economy is defined in terms of resident units (ESA 2010).

⁽⁴⁾ The aggregate of 'Total economy' and the 'Rest of the World' sector.

Source: Central Bank of Malta.

¹⁰ The financial sector includes the Central Bank of Malta, deposit-taking corporations other than the Central Bank of Malta, money market funds, non-MMF investment funds, other financial intermediaries except insurance corporations and pension funds, financial auxiliaries, captive financial institutions and money lenders, insurance corporations and pension funds. The non-financial sector includes non-financial corporations, households and non-profit institutions serving households.

Table 2
NON-CONSOLIDATED LIABILITIES BY COUNTERPARTY (FROM-WHOM-TO-WHOM)^(1,2)

EUR millions

Holders Borrowers	Non- financial sector	Financial sector	General government	Total economy	Rest of the world	Total
Non-financial sector	13,819	10,608	1,283	25,710	7,754	33,463
Currency	0	0	0	0	0	0
Deposits	0	0	0	0	0	0
Debt securities	379	142	0	521	212	733
Loans	7,056	8,752	20	15,828	1,895	17,723
Equity and Investment Fund Shares	3,938	1,031	536	5,505	2,685	8,190
Insurance, pension and standardised guarantees	0	0	0	0	0	0
Other accounts payable	2,446	683	727	3,856	2,962	6,818
<i>Net Financial Assets/Liabilities</i>	0	13,648	1,536	15,184	-3,468	11,716
Financial sector	24,255	8,246	1,727	34,229	210,480	244,709
Currency	750	173	0	924	0	924
Deposits	13,397	3,545	1,166	18,109	26,934	45,043
Debt securities	837	184	0	1,021	726	1,747
Loans	183	1,718	0	1,901	604	2,505
Equity and Investment Fund Shares	6,343	2,187	557	9,087	128,935	138,022
Insurance, pension and standardised guarantees	2,578	1	0	2,579	0	2,579
Other accounts payable	167	438	4	609	53,280	53,889
<i>Net Financial Assets/Liabilities</i>	-13,648	6	3,165	-10,477	8,477	-2,000
General government	2,819	4,892	140	7,851	660	8,511
Currency	0	0	0	0	0	0
Deposits	0	70	0	70	0	70
Debt securities	2,018	4,286	90	6,394	382	6,776
Loans	18	103	5	126	194	320
Equity and Investment Fund Shares	0	0	10	10	0	10
Insurance, pension and standardised guarantees	0	0	0	0	0	0
Other accounts payable	782	434	35	1,251	85	1,336
<i>Net Financial Assets/Liabilities</i>	-1,536	-3,165	0	-4,701	-81	-4,782
Total economy⁽³⁾	40,894	23,746	3,150	67,790	218,894	286,683
Currency	750	173	0	924	0	924
Deposits	13,397	3,615	1,166	18,178	26,934	45,112
Debt securities	3,235	4,611	90	7,935	1,320	9,255
Loans	7,257	10,573	25	17,855	2,693	20,548
Equity and Investment Fund Shares	10,282	3,218	1,103	14,603	131,620	146,223
Insurance, pension and standardised guarantees	2,578	1	0	2,579	0	2,579
Other accounts payable	3,395	1,555	765	5,715	56,327	62,043
<i>Net Financial Assets/Liabilities</i>	-15,184	10,488	4,701	6	4,928	4,933
Rest of the world	4,286	218,957	579	223,822	0	223,822
Monetary gold and SDRs	0	110	0	110	0	110
Currency	0	0	0	0	0	0
Deposits	1,025	7,876	0	8,901	0	8,901
Debt securities	229	26,003	0	26,232	0	26,232
Loans	258	39,573	222	40,053	0	40,053
Equity and Investment Fund Shares	815	111,993	88	112,895	0	112,895
Insurance, pension and standardised guarantees	0	0	0	0	0	0
Other accounts payable	1,958	33,402	270	35,630	0	35,630
<i>Net Financial Assets/Liabilities</i>	3,468	-8,477	81	-4,928	0	-4,928
Total⁽⁴⁾	45,179	242,703	3,729	291,611	218,894	510,505
Monetary gold and SDRs	0	110	0	110	0	110
Currency	750	173	0	924	0	924
Deposits	14,422	11,491	1,166	27,079	26,934	54,013
Debt securities	3,464	30,614	90	34,168	1,320	35,488
Loans	7,516	50,146	247	57,909	2,693	60,601
Equity and Investment Fund Shares	11,096	115,210	1,191	127,498	131,620	259,118
Insurance, pension and standardised guarantees	2,578	1	0	2,579	0	2,579
Other accounts payable	5,353	34,957	1,035	41,345	56,327	97,673
<i>Net Financial Assets/Liabilities</i>	-11,716	2,012	4,782	-4,922	4,928	6

⁽¹⁾ As at June 2016.

⁽²⁾ Data is in line with ESA 2010 and on a consolidated basis. Hence intra sector positions are included.

⁽³⁾ The total economy is defined in terms of resident units (ESA 2010).

⁽⁴⁾ The aggregate of 'Total economy' and the 'Rest of the World' sector.

Source: Central Bank of Malta.

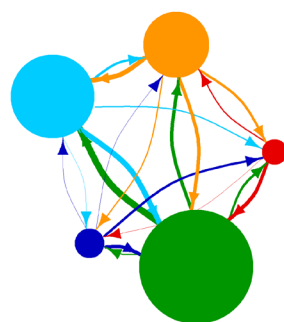
A network of balance sheets' exposure for the Maltese economy

One of the main uses of “from-whom-to-whom” data stems from its granularity, which allows the construction of financial networks across sectors at an instrument level. Network models are able to expose the most vulnerable and systemically important sectors within an economy. They can also be used to examine the propagation of financial shocks across the different economic sectors. Chart 3 illustrates the interlinkages between sectors using (total) liabilities, while Charts 4 and 5 focus on loans and debt securities, respectively.

Households are primarily linked to the financial sector through the liabilities they owe to banks (see Chart 3). The link between households and the general government is mainly due to the former's holdings of government debt securities. Similarly the main linkages of NFCs are with the ROW, the financial sector and with households. The financial sector is strongly linked to the ROW given the high presence of international companies operating from Malta. It is assumed that the latter's transactions are with non-residents. The financial sector is strongly linked to the ROW given the high presence of international companies operating from Malta. It is assumed that the latter's transactions are with non-residents.

Analysis on “from-whom-to-whom” data can be made at an instrument level. For instance, Charts 4 and 5 uncover financial linkages through loans and debt securities. The significant number of international companies in the Maltese economy remains a primary feature, as shown by the substantial amount of loans held by non-residents (see Chart 4). Chart 4 also shows that NFCs and households are the main institutional sectors which use loans to finance their activities. Households are granted loans predominantly from banks and, to a lesser extent, in the form of NFC loans to directors. On the other hand, NFCs hold loans with various other counterparties, including the financial sector, intra-sector loans, households (in the form of loans from directors) and loans from non-resident institutions. The general government's

Chart 3
LIABILITIES
(as at June 2016)

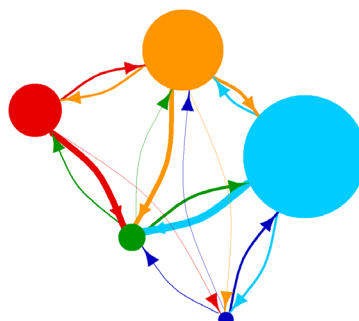


The diameter of the circle is proportional to the total liabilities of the sector and the arrow's width is proportional to their inter-sector relations. The arrow points to the counterpart sector to whom the particular sector owes the liability.

— Non-financial corporations — Rest of the world — General government
— Households — Financial sector

Source: Central Bank of Malta.

Chart 4
LOANS
(as at June 2016)



The diameter of the circle is proportional to the total loans of the sector and the arrow's width is proportional to their inter-sector relations. The arrow points to the counterpart sector to whom the particular sector owes the loans.

— Non-financial corporations — Rest of the world — General government
— Households — Financial sector

Source: Central Bank of Malta.

loans are mainly in the form of external loans.

As illustrated in Chart 5, debt securities are mainly issued by the general government, financial sector and non-financial corporations. It also shows that securities issued by the general government are mainly held by resident banks and households.

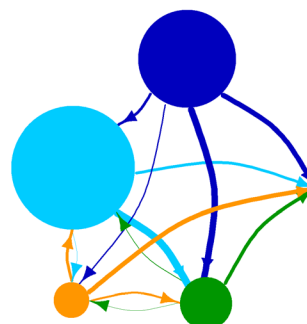
Charts 3, 4 and 5 show how network diagrams can be used to identify the spread of shocks across sectors. For instance, if NFCs default on their loans there will be a

ripple effect on other sectors: Banks' assets will decrease which in turn will make it difficult to meet their obligations with other sectors.¹¹ Studies show that contagion effects depend mainly on the location of the original shock and the connectivity of the network. The stronger the connectivity levels between sectors, the higher the speed with which shocks spread within the system.¹²

Concluding remarks

The recent global financial crisis has increased the need to understand the financial interlinkages of systemically important sectors in an economy. Although it is essential for financial analysts to identify possible threats to the financial stability of an economy, modelling and analysing the financial amplification mechanism is challenging as it requires a more granular and disaggregated level of data. The publication of "from-whom-to-whom" data by the Central Bank of Malta is intended to become a vital tool to tackle such analytical challenges, by improving the usefulness of financial accounts data. "From-whom-to-whom" data can be used to support economic and financial stability analysis, allowing the analysis of the current economic situation and the effects of policy decisions on distinct institutional sectors.¹³

Chart 5
DEBT SECURITIES ISSUED
(as at June 2016)



The diameter of the circle is proportional to the total debt securities issued by a particular sector and the arrow's width is proportional to their inter-sector relations. The arrow points to the counterpart sector holding the debt securities issued.

— Non-financial corporations — Rest of the world — General government
— Households — Financial sector

Source: Central Bank of Malta.

¹¹ Gray, D. and Malone, S. *Macrofinancial Risk Analysis*, Wiley Finance, 2008.

¹² Castrén, O. and Rancan, M., "Macro-networks: An application to the euro area financial accounts", *European Central Bank Working Paper No. 1510*, 2013.

¹³ Castrén, O. and Kavonius, I. K., "Balance Sheet Interlinkages and Macro-Financial Risk Analysis in the Euro Area", *European Central Bank Working Paper No. 1124*, 2009.